Appendix B.1

Final - Hydrogeological Investigation Report, Golder Associates

REPORT

Fifteen Mile Stream Gold Project

Hydrogeological Investigation

Submitted to:

Atlantic Mining NS Corp
409 Billybell Way, Mooseland
Middle Musquodoboit, Nova Scotia
B0N 1X0

Submitted by:

Golder Associates Ltd.
201 Brownlow Avenue, Suite 26 Dartmouth, Nova Scotia, B3B 1W2 Canada

+1 902 466 1668

1895674-003-Rev2

September 10, 2019

Distribution List

1 PDF Copy - Atlantic Mining NS Corp

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Executive Summary

Atlantic Mining NS Corp (AMNS), a wholly owned subsidiary of St. Barbara Ltd., is planning to develop the Fifteen Mile Stream Gold Project (the Project) located approximately 115 km east of Halifax, in Halifax County, in the province of Nova Scotia.

The objectives of the hydrogeological investigation were to collect baseline data on the local groundwater levels, groundwater quality, and overburden and shallow bedrock hydraulic characteristics including hydraulic conductivities.

A borehole drilling investigation was carried out and consisted of drilling at 14 locations over the site. Total drilling length for this investigation, combining overburden and rock lengths, was 290.22 m. Monitoring wells were installed in each borehole (with the exception of FMS-HG18-02X). Monitoring wells were completed at ground surface with a protective steel monument casing.

Findings of the hydrogeological investigation are summarized below.

Overburden and Bedrock

- The subsurface stratigraphy findings generally consist of a thin, discontinuous layer of topsoil (less than 0.10 m in thickness), followed by a discontinuous layer of fill, up to 1.52 m in thickness. The fill on-site is generally sourced from local materials that have been reworked as part of the historical land use.
- Underlying the discontinuous topsoil and fill is generally a compact to very dense glacial till, typically consisting of silty sand to silty gravel and frequently containing cobbles and/or boulders.
- The depth of the overburden varies across the site, and was observed to range from 1.01 to 6.32 m in the 2018 boreholes, with typical overburden depth ranging from 2 to 4 m.
- The bedrock consisted of slightly weathered to fresh, thinly to medium bedded, grey, medium, and fine grained, medium strong to strong Greywacke-Argillite to Argillite-Greywacke.
- No major features such as faults were observed during the FMS hydrogeological drilling program.

Groundwater Levels

- The groundwater levels measured were shallow, ranging from 0.13 to 4.95 mbgs (103.44 to 160.52 m relative to CGVD28). The groundwater elevations are similar, with less than 2 m difference, when comparing the bedrock (A) and bedrock-soil interface (B) wells at each location. Groundwater elevations at most borehole locations indicate slight downward or nearly neutral gradients.
- The hydrographs for wells generally show consistent groundwater levels over the monitoring period to date. Some fluctuation in groundwater levels is apparent, likely related seasonal variation and related to precipitation events.

Hydraulic Conductivity

The hydraulic conductivity of the subsurface materials at FMS was estimated by packer tests, single well response tests, and grain size analyses. The results are summarized as follows:

- The results of the packer testing program show a wide range of hydraulic conductivity across the area tested, ranging from 7 x 10^{-8} m/s to 6 x 10^{-5} m/s.
- The results of the rising head SWRT estimated hydraulic conductivities of the 'A' wells installed into the bedrock ranged from 6 x 10^{-8} m/s to 1 x 10^{-5} m/s and estimated hydraulic conductivities of the 'B' wells installed across the overburden-bedrock interface ranged from 1 x 10^{-7} m/s to 4 x 10^{-5} m/s.
- Estimates of hydraulic conductivity of select soil samples range from 4 x 10^{-9} m/s to 4 x 10^{-6} m/s.

Geochemistry

Bulk metals analyses were conducted on all twelve samples. The results of the bulk metals analyses are summarized as follows:

- Arsenic and bismuth concentrations are observed to be greater than ten times the average crustal abundance in the majority of samples.
- Lead concentrations are observed to be greater than ten times the average crustal abundance in sample FMS-HG18-06A, OS2.
- Antimony concentrations are observed to be greater than five times the average crustal abundance in two samples.
- All other constituents were detected at concentrations less than five times the average crustal abundance in all samples.

Acid Base Accounting (ABA) was completed on six samples. The results are summarized as follows:

- All samples have sulphide and total sulphur contents less than 0.2%, paste pH values above 5.5, and AP values less than 4 t $CaCO_3$/1000 t. Sulphide content in all samples is below the 0.4 wt% and 12.51 kg H_2SO_4/t exemption limits, described in Section 5, Subsection A of the Nova Scotia Sulphide Bearing Material Disposal Regulation (N.S. Reg. 57/95). However, applicability of this data, with respect to the regulation, is dependant upon the actual area and location of overburden to be removed. Low NP values result in NPR values below 2 for some samples; however, based on the low sulphide, sulphur, and AP values, all samples are expected to be non-acid generating.

Short-term leach testing was conducted on six samples and compared to the Canadian Environmental Quality Guidelines (CEQG) for the Protection of Freshwater Aquatic Life. The results are summarized as follows:

- The pH for all samples ranged from 5.2 to 7.3.
- Nitrate was greater than CEQG in three samples.
- Aluminum was greater than CEQG in four samples.
- Arsenic was greater than CEQG in three samples.
- Copper was greater than CEQG in two samples.

- Iron was greater than CEQG in one sample.
- Lead was greater than CEQG in one sample.
- Nickel was greater than CEQG in one sample.
- Zinc was greater than CEQG in three samples.
- All other parameters were below CEQGs.

Groundwater Quality

All groundwater quality results were compared to the Guidelines for Canadian Drinking Water Quality (CDWQ) and the Nova Scotia Environment Pathway Specific Standards for Groundwater (NSE PSS) for groundwater discharging to surface water (0-10 m from a fresh water body). The results of the laboratory analysis are summarized as follows:

- PHC/BTEX, and total and free cyanide were not detected in any of the samples collected.
- Total mercury exceeded the NSE PSS in two wells in September 2018, and total and dissolved mercury exceeded the NSE PSS in one well in November 2018. Total and dissolved mercury did not exceed the CDWQ in any samples collected in September 2018, November 2018, March 2019, or June 2019.
- Metals parameters exceeding the NSE PSS during the monitoring events included total mercury and dissolved aluminum, arsenic, cadmium, cobalt, copper, iron, manganese, mercury, selenium, silver, and zinc. It should be noted that the laboratory detection limit for dissolved cadmium is greater than the NSE PSS. Dissolved arsenic exceeded the CDWQ in seven wells in September 2018. Dissolved arsenic exceeded the CDWQ in six wells in November 2018, all of which also exceeded in September 2018. Dissolved arsenic exceeded the CDWQ in five wells in March 2019, all except one of which also exceeded in the 2018 sampling. Dissolved arsenic exceeded CDWQ in six wells in June 2019, all of which also exceeded in the previous sampling.
- Dissolved manganese exceeded the CDWQ in 13 wells. Health Canada established a guideline for manganese in May 2019. Previous sampling events were not compared to the new Health Canada CDWQ guideline; however, concentrations reported for the June 2019 sampling event are consistent with manganese concentrations from previous sampling events.
- Aluminum, iron, and zinc exceeded aesthetic objectives/operational guidance values in multiple wells during all monitoring events.
- No other metals parameters exceeded CDWQ MAC.

Table of Contents

1.0 INTRODUCTION 1

1.1 Overview of the Fifteen Mile Stream Project 1

1.2 Coordinate, Datum, and Unit Systems 1

2.0 OBJECTIVES 1

3.0 BACKGROUND INFORMATION 2

3.1 Surficial Geology 2

3.2 Bedrock Geology 2

3.3 Groundwater 2

4.0 INVESTIGATION METHODOLODY 3

4.1 Borehole Locations 3

4.2 Borehole Drilling 5

4.3 Monitoring Wells 6

4.4 Groundwater Levels 8

4.5 Hydraulic Conductivity Testing 8

4.5.1 Packer Testing 8

4.5.2 Single Well Response Tests 9

4.6 Laboratory Testing 9

4.6.1 Overburden 9

4.6.2 Groundwater 9

5.0 INVESTIGATION RESULTS 10

5.1 Overburden and Bedrock 10

5.2 Groundwater Levels 12

5.3 Hydraulic Conductivity 15

5.3.1 Packer Testing 15

5.3.2 Single Well Response Tests 17

5.3.3 Grain Size Estimates 18

5.4 Analytical Results 19
5.4.1 Overburden 19
5.4.1.1 Geochemical Test Work Methodology 20
5.4.1.1.1 Bulk Metals 20
5.4.1.1.2 Acid-Base Accounting 21
5.4.1.1.3 Short-term Leach Tests 21
5.4.1.2 Results 22
5.4.1.2.1 Bulk Metals 22
5.4.1.2.2 Acid-Base Accounting 22
5.4.1.2.3 Short-term Leach Testing 23
5.4.2 Groundwater 24
6.0 CLOSURE 29

TABLES

Table 1: Borehole Locations and Elevations 4
Table 2: Monitoring Well Screen Intervals 7
Table 3: Summary of Grain Size Analyses of Fill for the 2018 Hydrogeological Program 11
Table 4: Summary of Grain Size Analyses of Glacial Till for the 2018 Hydrogeological Program 11
Table 5: Summary of Geotechnical Logging Parameters for the 2018 Hydrogeological Rock Core Logging Program 12
Table 6: Groundwater Levels for FMS 2018 Hydrogeological Boreholes 13
Table 7: Packer Testing Results for FMS 2018 Hydrogeological Boreholes 15
Table 8: Single Well Response Test Summary 17
Table 9: Hydraulic Conductivity Estimates Based on Soil Grain Size 18
Table 10: Samples Selected for Overburden Geochemical Analyses 20
Table 11: Acid Generation Potentials Based on NP/AP 22
Table 12: Groundwater Concentrations Exceeding the MAC 25
Table 13: Dissolved Groundwater Concentrations Exceeding the NSE PSS 27
Plate 1: Atlantic Gold Deposits and Anticline Trends (Atlantic Gold Website) 3
Plate 2: Hydraulic Conductivity Profile for the 2018 Hydrogeological Packer Testing Results 16

FIGURES

Figure 1 – Drilling Locations and Infrastructure

Figure 2 – Surficial Geology

Plate 1: AMNS Deposits and Anticline Trends (AMNS Website) 3

Plate 2: Hydraulic Conductivity Profile for the 2018 Hydrogeological Packer Testing Results 16

APPENDICES

APPENDIX A
Record of Borehole Logs

APPENDIX B
Photography of Soil Split Spoons and Rock Cores

APPENDIX C
Overburden Grain Size Distribution Results

APPENDIX D
Groundwater Level Hydrographs

APPENDIX E
Single Well Response Test Analysis Sheets

APPENDIX F
Overburden Quality Results

APPENDIX G
Groundwater Quality Results

1.0 INTRODUCTION

Atlantic Mining NS Corp (AMNS), a wholly owned subsidiary of St. Barbara Ltd., is planning to develop the Fifteen Mile Stream Gold Project (the Project) located approximately 115 km east of Halifax, in Halifax County, in the province of Nova Scotia (NS) [Figure 1].

This factual report is intended to present the results of the hydrogeological baseline study and field investigation, with the objective of supporting the Environmental Impact Statement (EIS) process necessary to develop the Project.

1.1 Overview of the Fifteen Mile Stream Project

AMNS is planning to construct, operate, and eventually reclaim a new open pit gold mine at the Project site, which is defined by the red boundary noted on Figure 1. The proposed site infrastructure layout is also presented in Figure 1, which may be refined as a result of ongoing consultation and engineering studies. The major proposed Project components are expected to consist of:

- Open pit
- Tailings Management Facility
- Ore Stockpile
- Waste Rock Stockpile
- Till Stockpile
- Plant Site

These facilities will be supported by other infrastructure as required during the construction, operations, and closure of the Project.

1.2 Coordinate, Datum, and Unit Systems

All coordinates given in this report are referenced to North American Datum 1983 (NAD83(CSRS)), Universal Transverse Mercator (UTM) Grid Projection Zone 20. All vertical levels discussed in this report are referenced to Canadian Geodetic Vertical Datum of 1928 (CGVD28).

This report is presented using the International System of Units (SI), where length is described in meters (m), mass in kilograms (kg), and pressure in Pascals (Pa).

2.0 OBJECTIVES

The objectives of the hydrogeological investigation were to collect baseline data on the local groundwater levels, overburden and groundwater quality, and overburden and shallow bedrock hydraulic characteristics, including hydraulic conductivities. The baseline hydrogeological data will inform the creation of three-dimensional groundwater flow, solute transport models, and provide a hydrogeological technical background for the EIS submission for the FMS project.

3.0 BACKGROUND INFORMATION

This section outlines the site background information related to surficial geology, bedrock geology, and groundwater.

3.1 Surficial Geology

The surficial geology at FMS is characterized by stony till plains and/or silty till plains (ground moraine). The topography is flat to rolling, with many exposed boulders and elongated drumlins or oval hills partially covered by till from the Wisconsinan glaciation. The till is a mix of material derived from local bedrock sources, with a stony to silty sand matrix. The till plains and drumlins are generally 2 m to 30 m in thickness (N.S. DNR, 1992).

3.2 Bedrock Geology

The FMS site lies within the Goldenville Formation, comprising sandstone turbidites and slate of Cambrian age.

Gold mineralization at FMS occurs in rocks of the Moose River member of the Goldenville Formation, in the Meguma Terrane, similar to AMNS's Touquoy Gold Project, located approximately 37 km west (Plate 1). The deposits consist of disseminated and vein-hosted gold located within a folded sequence.

The main FMS deposit, Egerton-MacLean, will expose an overturned anticline and a syncline with beds dipping mainly to the north. The south limb is offset by a normal fault referred to as the Seigel fault, which marks a change in the bedding dip from moderately north dipping (north of the fault) to steeply north dipping (south of the fault) (N.S. DNR, 2000).

3.3 Groundwater

The Nova Scotia Well Logs Database (N.S. DNR, 2018) was queried to find well records near the Project. No wells were identified close to the Project, with the nearest wells located approximately 15 km to the north and south.

Provincial scale mapping identifies the FMS area as having a high relative risk of arsenic in groundwater at concentrations exceeding drinking water health guidelines (Kennedy, 2017). The FMS area falls within the area mapped as less likely to have groundwater concentrations of uranium (and related radionuclides) that exceed the drinking water health guidelines (O'Reilly, 2009).

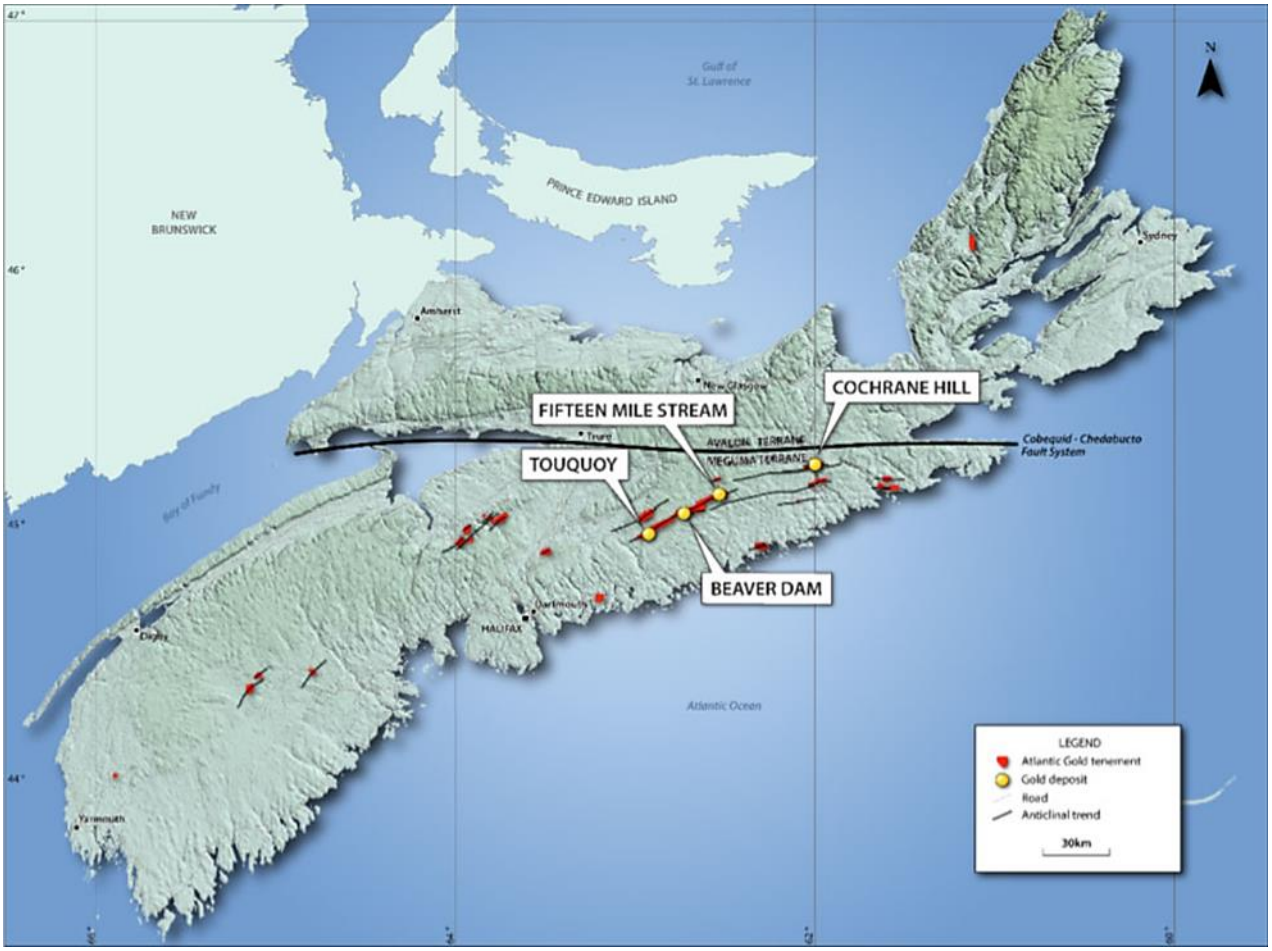

Plate 1: AMNS Deposits and Anticline Trends (AMNS Website)

4.0 INVESTIGATION METHODOLODY

This section describes the site investigation program, including the number and location of boreholes. Herein is described the methodology for borehole drilling, the installation of monitoring wells, and collecting groundwater levels. Hydraulic conductivity testing is described in Section 4.5 and laboratory testing of overburden and groundwater samples collected during the field investigation is outlined in Section 4.6.

4.1 Borehole Locations

The in-field investigations were carried out at 14 drilling locations over the site. At each drilling location up to two monitoring wells were installed within individual offset boreholes. The completed borehole/monitoring well locations are shown on Figure 1 and listed in Table 1 below. The location surveying was conducted by WSP, with coordinates received on August 29, 2018. Borehole locations are denoted as FMS-HG18-01 through to FMS-HG18-16, with the exception of proposed locations FMS-HG18-01 and FMS-HG18-12, which were removed from the scope during the investigation.

Table 1: Borehole Locations and Elevations

Borehole/ Monitoring Well ID	Coordinates (UTM Zone 20, NAD83(CSRS))		Ground Surface Elevation (m CGVD28)	Drilled Depth (mbgs[1])
	Northing (m)	Easting (m)		
FMS-HG18-02A	536074.78	5001177.74	135.97	24.24
FMS-HG18-02B	536073.90	5001174.33	135.85	8.22
FMS-HG18-02X	*Abandoned borehole located adjacent to FMS-HG18-02A*			
FMS-HG18-03A	537293.47	4999550.33	121.58	12.08
FMS-HG18-03B	537290.61	4999550.81	121.77	7.05
FMS-HG18-04A	535801.11	4998824.55	106.66	25.74
FMS-HG18-04B	535800.77	4998822.68	106.67	7.79
FMS-HG18-05A	537263.21	4998507.48	113.53	13.81
FMS-HG18-05B	537262.41	4998509.10	113.68	6.36
FMS-HG18-06A	537513.23	4998697.25	111.97	8.36
FMS-HG18-07A	537889.27	4998795.88	112.98	12.37
FMS-HG18-07B	537883.79	4998796.17	112.78	4.85
FMS-HG18-08A	537612.69	4997771.11	140.03	13.93
FMS-HG18-08B	537611.40	4997771.21	139.98	6.45
FMS-HG18-09A	538367.38	4999479.78	123.58	12.38
FMS-HG18-09B	538367.24	4999477.38	123.62	6.32
FMS-HG18-10A	539251.88	4998600.50	140.31	12.30
FMS-HG18-10B	539248.83	4998600.75	140.19	6.56
FMS-HG18-11A	538575.33	4997758.94	162.38	10.92
FMS-HG18-11B	538573.36	4997760.25	162.41	4.94
FMS-HG18-13A	539918.74	4997839.08	151.29	12.43
FMS-HG18-13B	539918.74	4997839.08	151.33	3.08

Borehole/ Monitoring Well ID	Coordinates (UTM Zone 20, NAD83(CSRS))		Ground Surface Elevation (m CGVD28)	Drilled Depth (mbgs[1])
	Northing (m)	Easting (m)		
FMS-HG18-14A	536802.34	4998352.85	116.89	13.81
FMS-HG18-14B	536804.30	4998352.73	116.97	7.83
FMS-HG18-15A	536367.44	4998746.87	107.46	10.83
FMS-HG18-15B	536367.09	4998743.63	107.56	4.17
FMS-HG18-16A	540442.99	4999567.69	142.17	11.02
FMS-HG18-16B	540445.43	4999567.50	142.19	5.65

Note:
1. Meters below ground surface (mbgs)

Borehole locations were selected to provide broad coverage of the proposed site facility areas; and due to proximity to key infrastructure such as proposed pit, dam and processing facility locations and existing surface water features.

Borehole locations were constrained by the existing access road network, property access agreements, and offsets from environmentally sensitive areas.

4.2 Borehole Drilling

Borehole drilling for this investigation was carried out between May 29 to June 16, 2018, and July 30 to August 14, 2018. Drilling was performed by Logan Drilling Group (Logan) of Stewiacke, Nova Scotia using CME drill rigs mounted on tracked carriers. One CME-75 type rig was dedicated for the duration of the program, and the second Logan drill team used two rigs (CME-55 and CME-45) based on availability. Logan was contracted to AMNS but was supervised during borehole drilling by Golder staff, who logged the soil and rock samples at the drill rig as they were recovered.

Drilling through the overburden was advanced with a rotary tricone bit with water flush. “HTW” size casing was advanced through the overburden and into the upper bedrock to prevent collapse of the borehole. Standard Penetration Testing (SPT) was carried out at 0.0 m and 0.6 m depth, and then at 0.75 m intervals to collect soil samples for geological and geotechnical characterization. An oversized split spoon was used to sample for chemical characterization, taken over the same depth interval as the standard size split spoon at the corresponding sample number. The oversized split spoon samples were taken for each unique overburden unit encountered at each borehole location. In areas of difficult advance, the overburden was drilled with HQ coring equipment, and SPT samples were collected opportunistically when ground conditions allowed. Often in difficult advance areas, the SPT sample recovery was low, and oversized split spoon samples for chemical characterization were not attempted. The overburden encountered did not meet the criteria for Shelby tube sampling.

Drilling through bedrock was advanced by coring with triple tube HQ3 size equipment. Casing was not advanced past the top of competent bedrock unless unstable or permeable rock was encountered at deeper depths.

Geotechnical logging of the rock core recovered included rock type and description, Total Core Recovery (TCR), Solid Core Recovery (SCR), Rock Quality Designation (RQD), fracture index, feature measurements and characterization, and strength and weathering classification.

The first and deepest borehole (denoted “A”) at each location was advanced into bedrock to the depth at which the criteria to terminate the borehole was met. The borehole termination criteria began with minimum Rock Quality Designation (RQD) above 80% for at least the final 3.0 m and was later increased to 4.5 m based on the good quality shallow rock encountered at the beginning of the program. In addition to RQD criteria, the rock mass was judged to be characteristic of the site competent rock, such that weathering, alteration, micro-defect intensity, and strength were not observed to negatively impact the rock mass behaviour. Additionally, the borehole termination criteria specified that a minimum borehole depth of 10 m and a minimum rock depth of 6 m were to be reached. Following completion of drilling, borehole A underwent packer testing (detailed in Section 4.5), and a monitoring well was installed in the bedrock.

The second borehole (denoted “B”) at each drilling location was advanced to a target depth for the purpose of installing a second, shallower well screened across the bedrock/overburden interface. Soils were only logged in the first borehole at each location while bedrock was logged in both the first and second boreholes. At the FMS site, no third boreholes (denoted “C”) were drilled for overburden well installations because the overburden thickness was less than 10 m at all borehole locations.

During the drilling program, a total of 43.96 m of overburden was logged, with a total of 89.94 m of overburden drilled, including all secondary (B) drillholes advanced at each of the drilling sites. A total of 200.28 m of rock was drilled and logged in full, including primary (A) and secondary (B) drillholes at each of the drilling sites. Total drilling length for this investigation, combining overburden and rock lengths, was 290.22 m.

At location FMS-HG18-02, the first borehole to be drilled had to be abandoned, due to collapsing borehole walls. This borehole was denoted FMS-HG18-02X, and a replacement borehole was then drilled adjacent this location following the procedures for the first borehole. At location FMS-HG18-06, the first borehole encountered an underground mine opening and could not advance beyond the mine opening due to risk of damage to the drilling equipment. No subsequent boreholes were drilled at site FMS-HG18-06, due to the high probability of intersecting more historic mining openings.

4.3 Monitoring Wells

Monitoring wells were installed in each borehole (with the exception of FMS-HG18-02X) with screens at the intervals summarized in Table 2 below. Wells were constructed as standpipe piezometers with nominal 50 mm (2”) diameter PVC screen and risers. Except for FMS-HG18-06A, the annulus around the screen intervals were backfilled with graded clean silica sand, and the annulus above the screen interval were sealed with bentonite. Well FMS-HG18-06A was installed into an open void interpreted to be a former mine working; therefore, no sand pack could be installed around the screen and the riser annulus was backfilled with caved-in material and bentonite. Monitoring wells were completed at ground surface with a protective steel monument casing.

After installation of each monitoring well, the well was developed with a Waterra Hydrolift inertial pump system by pumping at least 10 well volumes of water from the well, or until the well was pumped dry. Basic water quality

parameters were measured regularly during well development to monitor for changes as the development progressed.

Table 2: Monitoring Well Screen Intervals

Borehole/Monitoring Well ID	Screen Interval (mbgs)	Screen Interval (m CGVD28)
FMS-HG18-02A	17.36 - 20.41	118.61 - 115.56
FMS-HG18-02B	2.46 - 7.03	133.39 - 128.82
FMS-HG18-03A	8.93 - 11.98	112.65 - 109.60
FMS-HG18-03B	3.84 - 6.89	117.93 - 114.88
FMS-HG18-04A	14.88 - 20.98	91.78 - 85.68
FMS-HG18-04B	4.07 - 7.12	102.60 - 99.55
FMS-HG18-05A	9.17 - 13.70	104.36 - 99.83
FMS-HG18-05B	2.84 - 5.89	110.84 - 107.79
FMS-HG18-06A	3.33 - 6.38	108.64 - 105.59
FMS-HG18-07A	7.68 - 10.73	105.30 - 102.25
FMS-HG18-07B	1.71 - 4.76	111.07 - 108.02
FMS-HG18-08A	10.29 - 13.34	129.74 - 126.69
FMS-HG18-08B	1.39 - 5.96	138.59 - 134.02
FMS-HG18-09A	8.98 - 12.03	114.60 - 111.55
FMS-HG18-09B	3.14 - 6.19	120.48 - 117.43
FMS-HG18-10A	9.22 - 12.27	131.09 - 128.04
FMS-HG18-10B	1.90 - 6.47	138.29 - 133.72
FMS-HG18-11A	7.87 - 10.92	154.51 - 151.46
FMS-HG18-11B	1.85 - 4.90	160.56 - 157.51
FMS-HG18-13A	9.38 - 12.43	141.91 - 138.86
FMS-HG18-13B	2.52 - 5.57	148.81 - 145.76
FMS-HG18-14A	9.55 - 12.60	107.34 - 104.29

Borehole/Monitoring Well ID	Screen Interval (mbgs)	Screen Interval (m CGVD28)
FMS-HG18-14B	1.86 - 6.43	115.11 - 110.54
FMS-HG18-15A	7.73 - 10.78	99.73 - 96.68
FMS-HG18-15B	1.03 - 4.08	106.53 - 103.48
FMS-HG18-16A	7.86 - 10.91	134.31 - 131.26
FMS-HG18-16B	2.42 - 5.47	139.77 - 136.72

Well installations details are provided on the borehole log records in Appendix A.

4.4 Groundwater Levels

Groundwater levels in the FMS monitoring wells are monitored manually, with an electric water level probe. Some wells have also had dataloggers installed to record water levels automatically. Pressure transducer dataloggers have been installed in both A and B wells at locations FMS-HG18-02, -04, -05, -07, -09, and -10. Groundwater levels are measured in the field relative to a surveyed reference point (typically the top of the PVC riser pipe) so they can be converted to equivalent groundwater elevations for comparison across the site.

4.5 Hydraulic Conductivity Testing

Hydraulic Conductivity Testing was conducted in two phases as part of the field investigation. The below sections describe the methodology for packer testing and single well response testing as carried out during the program.

4.5.1 Packer Testing

After completion of drilling at each borehole A, the borehole was flushed with clear water to remove drill cuttings, and packer testing was carried out with a wireline single packer assembly. Due to the ground conditions at FMS-HG18-06A, as previously described, no packer test could be carried out.

The packer assembly was located with a bit stop at the end of the drill rod string and was positioned as close to the top of the bedrock as rock quality would allow. The testing interval was therefore from the bottom of the packer assembly to the bottom of the borehole. Testing consisted of a falling head test (FHT) performed by filling the drill rods with water and monitoring the recovery with manual measurements and dataloggers. If recovery during the FHT was rapid (less than 30 minutes for full recovery) or if additional test data was required, a constant rate injection test (CRI) was carried out. In many cases where bedrock and water levels were shallow, not enough head change could be created and measured due to the dimensions of the packer and testing assembly. In these cases, a CRI was performed in place of the FHT. The interval water pressure was continuously measured by a dedicated datalogger installed below the packer assembly within the testing interval. For monitoring purposes during the testing, a second datalogger with real-time data readout was used. For FHT, the monitoring datalogger was lowered into the water column in the drill rod string and compared with manual water levels taken with an

electric water level probe. For the CRI tests, the monitoring datalogger was connected to the flow manifold and compared against an analogue pressure gauge.

4.5.2 Single Well Response Tests

Rising Head Single Well Response Tests (SWRT) were performed at each monitoring well (with the exception of FMS-HG18-06A) after the wells had recovered from well development. The tests were carried out by lowering one to three plastic bailers (nominal 1-liter volume for each bailer) into the water column and letting them fill with water. Once the bailers were full and the water level had stabilized, the bailers were removed from the well and the subsequent water level recovery was monitored with a water level measuring probe and with a datalogger installed near the bottom of the well.

4.6 Laboratory Testing

This section describes the geotechnical and chemical testing program for overburden samples, as well as the groundwater quality testing program.

4.6.1 Overburden

Geotechnical Testing of Overburden

The geotechnical soil samples that were collected by SPT methods (as described in Section 4.2) were analyzed by Englobe in Dartmouth, Nova Scotia. The samples were tested for the following parameters:

- Moisture content
- Atterberg limits
- Grain size distribution (mechanical sieve and/or hydrometer)

Geochemical Analyses of Overburden

Overburden samples for geochemical analysis were collected by oversized split spoon, at the same depth interval as the corresponding standard split spoon sample number (as further described in Section 4.2). Geochemical analyses on samples of overburden were carried out by SGS Canada Ltd. in Lakefield, Ontario. Testing included the following:

- Trace metals analysis to quantify the elemental composition of the overburden samples.
- Acid base accounting to evaluate the acid rock drainage (ARD) potential of overburden samples.
- Short-term leach testing to evaluate the metal leaching (ML) potential of overburden samples.

4.6.2 Groundwater

Groundwater samples were collected from each monitoring well on-site from September 4 to 6, 2018 (Round 1); November 19 to 20, 2018 (Round 3); March 21 to 22, 2019 (Round 5); and again, June 4 to June 5, 2019 (Round 6). Prior to the collection of samples, each monitoring well was developed by the removal of ten well volumes of water, or by pumping the well dry and allowing it to recover three times. This development process

was carried out using a Waterra Hydrolift inertial pump system. To minimize the influence of suspended sediment on the groundwater quality results, all samples were collected using low-flow sampling methodology with a peristaltic pump. This method involved positioning the pump intake approximately 1 m below the water surface with the pump allowed to run at a flow rate of approximately 1 L/min.

Analytical bottles for each sample were provided by AGAT Laboratories and were filled directly from the peristaltic pump discharge. Groundwater quality samples were submitted under chain of custody to AGAT Laboratories in Dartmouth, NS. Radium-226 analysis was conducted by the Saskatchewan Research Council, as subcontracted by AGAT.

Groundwater quality samples were analyzed for the following parameter suites: Atlantic RBCA Tier 1 Hydrocarbons (including benzene; toluene; ethylbenzene, xylene [BTEX], and petroleum hydrocarbons [PHC]); total and free cyanide; total and dissolved mercury; general chemistry; total and dissolved phosphorous; chemical oxygen demand; dissolved organic carbon; and total suspended solids.

Standard sampling protocols were followed to ensure accuracy and precision of results. This included decontamination procedures, the collection of QA/QC samples, labelling, preserving, completed Chain of Custody forms, and packaging QA/QC procedures in the laboratory.

QA/QC sampling was conducted for approximately 10% of samples that were analyzed. Field QA/QC was addressed by collecting blind field duplicates. The results of the QA/QC sampling were used to evaluate the reliability of the sampling and analysis methods.

5.0 INVESTIGATION RESULTS

This section describes the results of borehole logging, groundwater level measurements, hydraulic conductivity testing, and laboratory testing results.

5.1 Overburden and Bedrock

The record of borehole logs are presented in Appendix A, with photos of the recovered overburden and rock presented in Appendix B.

The subsurface stratigraphy findings generally consist of a thin, discontinuous layer of topsoil (less than 0.10 m in thickness), followed by a discontinuous layer of fill, up to 1.52 m in thickness. The fill on-site is difficult to identify, as it is generally sourced from local materials that have been reworked as part of the historical land use. The unit is logged as loose to very dense silty gravel and sand to silty sand. Organics and cobbles and/or boulders were occasionally encountered in the fill.

Underlying the discontinuous topsoil and fill is compact to very dense glacial till, typically consisting of silty sand to silty gravel and frequently containing cobbles and/or boulders. In FMS-HG18-03A, a very dense silt layer (0.59 m in thickness) was encountered underlying the sandy silty gravel till. In FMS-HG18-10A, a gravel layer of residual soil (0.90 m in thickness) was encountered underlying the sandy silty gravel till.

The depth of the overburden varies across the site and was observed to range from 1.01 to 6.32 m in the 2018 boreholes, with typical overburden depth ranging from 2 to 4 m. FMS-HG18-02X has the least overburden thickness at 1.01 m; FMS-HG18-03A has the greatest overburden thickness at 6.32 m.

Moisture content determinations were performed on three samples of fill, with an average moisture content of 5%. Moisture content determinations on 18 samples of glacial till yielded a minimum value of 3%, a maximum value of 24%, and an average value of 10%. A single moisture content determination on the silt in FMS-HG18-03A resulted in a moisture content of 22%.

Atterberg Limit determinations were carried out on five samples of glacial till; all samples tested “non-plastic”.

Table 3 and Table 4 present the grain size analysis results for the select samples of fill and glacial till, respectively, from the present investigation. The full details of the individual sample results are presented in Appendix C.

Table 3: Summary of Grain Size Analyses of Fill for the 2018 Hydrogeological Program

Subsurface Unit	Grain Size	Average	Standard Deviation	Minimum	Maximum	Test Count
Fill (Silty Gravel and Sand to Silty Sand)	Gravel (%)	44	3	41	47	3
	Sand (%)	37	5	32	41	
	Silt-sized (%)	15	4	11	18	
	Clay-sized (%)	4	3	2	7	

Table 4: Summary of Grain Size Analyses of Glacial Till for the 2018 Hydrogeological Program

Subsurface Unit	Grain Size	Average	Standard Deviation	Minimum	Maximum	Test Count
Glacial Till (Silty Sand to Silty Gravel)	Gravel (%)	35	9	19	52	18
	Sand (%)	36	6	26	47	
	Silt-sized (%)	22	7	11	42	
	Clay-sized (%)	5	4	2	17	

The bedrock consisted of slightly weathered to fresh, thinly to medium bedded, grey, medium and fine grained, medium strong to strong Greywacke-Argillite to Argillite-Greywacke. The thickest continuous greywacke lithological unit observed was 5.35 m thick along the borehole in FMS-HG18-09A. The thickest continuous argillite lithological unit was observed in FMS-HG18-05A at 9.75 m thick along the borehole. In some locations, the weathering increased to moderately weathered near surface. Similarly, the strength varied from weak in some argillite beds to very strong in some greywacke beds. Occasional vugs were observed in the greywacke, and occasional silicification was observed in both lithological units. Borehole FMS-HG18-06A displayed the highest degree of weathering, with deep, continuous iron oxidation and infilling, which may be related to the underlying historic mining opening that was intersected by the borehole. Borehole FMS-HG18-04A was drilled to the deepest depth of 25.74 m due to unusual micro-defect density and alteration. This alteration and elevated micro-defect

intensity is no longer observed below a sharp contact at 19.54 m depth between argillite-greywacke and argillite. No major features such as faults were observed during the FMS hydrogeological drilling program.

The geotechnical logged parameters of the rock core are summarized in Table 5 for the rock core logging program, including all boreholes, totalling 200.38 m of rock core.

Table 5: Summary of Geotechnical Logging Parameters for the 2018 Hydrogeological Rock Core Logging Program

Geotechnical Core Logging Parameter	Average	Standard Deviation	Minimum	Maximum
Total Core Recovery (TCR, %)	99	3.69	78	100
Solid Core Recovery (SCR, %)	54	23.09	0	96
Rock Quality Designation (RQD, %)	83	16.70	30	100
Fracture Count per 0.25 m	2.29	4.53	0	25 (maximum defined value)

5.2 Groundwater Levels

Data from six complete groundwater level monitoring rounds of the wells installed at FMS are presented in Table 6 below. The first two rounds of groundwater level monitoring from August 2018 were taken opportunistically, following well installation and development. The regular groundwater level monitoring program commenced in September 2018 when the first baseline groundwater quality samples were collected from the wells. Groundwater level monitoring was subsequently conducted in October, November, and December of 2018, as well as March and June of 2019. Hydrographs for select wells showing the manual and continuous groundwater levels are presented alongside precipitation records in Appendix D.

The groundwater levels measured were shallow, ranging from 0.13 to 4.95 mbgs. Groundwater elevations ranged from 103.44 to 160.52 m relative to CGVD28. The groundwater elevations are similar, with less than 2 m difference, when comparing the bedrock (A) and bedrock-soil interface (B) wells at each location. Groundwater elevations at most borehole locations indicate slight downward or nearly neutral gradients. Slight upward gradients between A/B well pairs were observed at locations FMS-HG18-04, -07, -10, -15, and -16.

The hydrographs for wells at FMS-HG18-02, -04, -05, -07, -09, and -10 (Appendix D) generally show consistent groundwater levels over the monitoring period to date. Some fluctuation in groundwater levels is apparent, likely related to seasonal variation and precipitation events. The precipitation data shown on the hydrographs is from the Malay Falls weather station, located approximately 18 km from the site (NS DNR, 2018).

Table 6: Groundwater Levels for FMS 2018 Hydrogeological Boreholes

Borehole	Water Level (mbgs), Collected on Aug. 15/18	Water Level (m CGVD28), Collected on Aug. 15/18	Water Level (mbgs), Collected on Aug. 20/18	Water Level (m CGVD28), Collected on Aug. 20/18	Water Level (mbgs), Collected on Sept. 4-6/18	Water Level (m CGVD28), Collected on Sept. 4-6/18	Water Level (mbgs), Collected on Oct. 9/18	Water Level (m CGVD28), Collected on Oct. 9/18	Water Level (mbgs), Collected on Nov. 17-18/18	Water Level (m CGVD28), Collected on Nov. 17-18/18	Water Level (mbgs), Collected on Dec. 11/18	Water Level (m CGVD28), Collected on Dec. 11/18	Water Level (mbgs), Collected on Mar. 21-22/19	Water Level (m CGVD28), Collected on Mar. 21-22/19	Water Level (mbgs), Collected on Jun. 4/19	Water Level (m CGVD28), Collected on Jun. 4/19
FMS-HG18-02A	3.56	132.41	3.60	132.37	3.69	132.28	3.66	132.31	2.77	133.20	2.94	133.03	2.87	133.10	4.22	132.74
FMS-HG18-02B	3.35	132.5	3.34	132.51	3.42	132.43	3.55	132.30	2.59	133.26	2.76	133.09	2.65	133.20	3.95	132.87
FMS-HG18-03A	4.48	117.1	4.68	116.9	4.79	116.79	4.51	117.07	3.33	118.25	3.61	117.97	3.39	118.19	4.95	117.67
FMS-HG18-03B	4.07	117.7	4.68	117.09	4.85	116.92	4.52	117.25	3.44	118.33	3.72	118.05	3.52	118.25	4.89	117.75
FMS-HG18-04A	1.98	104.68	2.07	104.59	2.23	104.43	1.98	104.68	1.40	105.26	1.42	105.23	1.60	105.06	2.53	105.16
FMS-HG18-04B	2.88	103.79	2.04	104.63	3.23	103.44	2.74	103.93	2.20	104.47	2.42	104.24	2.37	104.30	2.96	104.68
FMS-HG18-05A	2.28	111.25	2.12	111.41	2.46	111.07	2.12	111.41	1.85	111.68	2.05	111.48	1.99	111.54	2.82	111.64
FMS-HG18-05B	2.09	111.59	2.00	111.68	2.28	111.40	1.81	111.87	1.22	112.46	1.59	112.09	1.61	112.07	2.30	112.44
FMS-HG18-06A	1.41	110.56	1.46	110.51	1.50	110.47	1.36	110.61	1.22	110.75	1.35	110.62	1.36	110.61	2.19	110.72
FMS-HG18-07A	0.45	112.53	0.41	112.57	0.50	112.48	0.44	112.54	0.28	112.70	0.35	112.63	Frozen, inaccessible.	Frozen, inaccessible.	1.29	112.59
FMS-HG18-07B	0.29	112.49	0.29	112.49	0.32	112.46	0.24	112.54	0.13	112.65	0.21	112.57	Frozen, inaccessible.	Frozen, inaccessible.	1.16	112.60
FMS-HG18-08A	2.60	137.43	2.48	137.55	2.79	137.24	2.46	137.57	2.11	137.92	2.32	137.71	2.24	137.79	3.08	137.83
FMS-HG18-08B	2.17	137.81	2.32	137.66	2.69	137.29	2.26	137.72	1.55	138.43	1.86	138.12	1.61	138.37	2.45	138.38
FMS-HG18-09A	2.16	121.42	2.06	121.52	2.35	121.23	1.93	121.65	1.39	122.19	1.62	121.97	1.49	122.09	2.43	122.10
FMS-HG18-09B	1.59	122.03	1.44	122.18	1.87	121.75	1.36	122.26	0.62	123.00	0.87	122.76	0.68	122.94	1.58	122.96
FMS-HG18-10A	1.60	138.71	1.34	138.97	1.60	138.71	1.27	139.04	0.96	139.35	1.14	139.17	1.07	139.24	2.00	139.25
FMS-HG18-10B	1.34	138.85	1.24	138.95	1.45	138.74	1.20	138.99	0.88	139.31	1.19	138.99	1.09	139.10	2.98	139.23
FMS-HG18-11A	3.90	158.48	4.07	158.31	4.18	158.20	3.74	158.64	3.20	159.18	3.57	158.82	3.28	159.10	4.22	159.05
FMS-HG18-11B	3.33	159.08	3.24	159.17	3.57	158.84	2.97	159.44	1.98	160.43	2.62	159.79	2.30	160.11	2.85	160.52
FMS-HG18-13A	3.67	147.62	3.50	147.79	4.04	147.25	3.50	147.79	2.93	148.36	3.15	148.14	3.06	148.23	3.99	148.27
FMS-HG18-13B	1.79	149.54	1.57	149.76	2.26	149.07	1.50	149.83	0.36	150.97	0.80	150.53	0.54	150.79	1.50	150.88

Borehole	Water Level (mbgs), Collected on Aug. 15/18	Water Level (m CGVD28), Collected on Aug. 15/18	Water Level (mbgs), Collected on Aug. 20/18	Water Level (m CGVD28), Collected on Aug. 20/18	Water Level (mbgs), Collected on Sept. 4-6/18	Water Level (m CGVD28), Collected on Sept. 4-6/18	Water Level (mbgs), Collected on Oct. 9/18	Water Level (m CGVD28), Collected on Oct. 9/18	Water Level (mbgs), Collected on Nov. 17-18/18	Water Level (m CGVD28), Collected on Nov. 17-18/18	Water Level (mbgs), Collected on Dec. 11/18	Water Level (m CGVD28), Collected on Dec. 11/18	Water Level (mbgs), Collected on Mar. 21-22/19	Water Level (m CGVD28), Collected on Mar. 21-22/19	Water Level (mbgs), Collected on Jun. 4/19	Water Level (m CGVD28), Collected on Jun. 4/19
FMS-HG18-14A	4.75	112.14	4.72	112.17	4.83	112.06	4.60	112.29	3.92	112.97	3.14	113.76	4.11	112.78	5.23	112.63
FMS-HG18-14B	4.71	112.26	4.68	112.29	4.80	112.17	4.55	112.42	3.76	113.21	4.00	112.97	3.98	112.99	5.16	112.80
FMS-HG18-15A	0.66	106.8	0.61	106.85	0.82	106.64	0.59	106.87	0.48	106.98	0.56	106.90	Frozen, inaccessible.	Frozen, inaccessible.	1.52	106.94
FMS-HG18-15B	0.92	106.64	0.93	106.63	1.07	106.49	0.87	106.69	0.78	106.78	0.85	106.71	0.80	106.76	1.84	106.75
FMS-HG18-16A	2.79	139.38	2.79	139.38	3.07	139.10	2.86	139.31	0.84	141.33	1.14	141.04	1.51	140.66	2.44	140.61
FMS-HG18-16B	3.39	138.8	3.44	138.75	3.60	138.59	2.45	139.74	0.84	141.35	1.17	141.02	1.58	140.61	2.48	140.59

5.3 Hydraulic Conductivity

The hydraulic conductivity of the subsurface materials at FMS was estimated by packer tests, single well response tests, and grain size analyses. The results are presented in the below sections.

5.3.1 Packer Testing

The results of the packer testing program at FMS are summarized in Table 7. The tests were analysed using the Hvorslev methods for constant and variable head conditions (Hvorslev, 1951). The results show a wide range of hydraulic conductivity across the area tested, ranging from 7×10^{-8} m/s to 6×10^{-5} m/s.

The results of the packer tests are also plotted on Plate 2 showing the intervals tested relative to depth below top of bedrock and the resulting hydraulic conductivity estimate for each test.

Table 7: Packer Testing Results for FMS 2018 Hydrogeological Boreholes

Borehole	Test Number	Test Interval (mbgs)	Test Interval (m CGVD28)	Test Type	Hydraulic Conductivity (m/s)
FMS-HG18-02A	Test 1	6.83 - 24.24	129.14 - 111.73	CRI	7E-08
FMS-HG18-03A	Test 1	9.38 - 12.08	112.20 - 109.50	FHT	2E-07
FMS-HG18-04A	Test 1	19.46 - 25.74	87.20 - 80.92	CRI	2E-07
FMS-HG18-04A	Test 2	7.39 - 25.74	99.27 - 80.92	CRI	7E-08
FMS-HG18-05A	Test 1	6.00 - 13.81	107.53 - 99.72	CRI	6E-06
FMS-HG18-05A	Test 2	8.57 - 13.81	104.96 - 99.72	CRI	6E-06
FMS-HG18-07A	Test 1	4.65 - 12.37	108.33 - 100.61	CRI	4E-07
FMS-HG18-08A	Test 1	4.16 - 13.93	135.87 - 126.10	CRI	1E-05
FMS-HG18-08A	Test 2	7.39 - 13.93	132.64 - 126.10	CRI	2E-06
FMS-HG18-09A	Test 1	6.10 - 12.38	117.48 - 111.20	CRI	5E-07
FMS-HG18-10A	Test 1	5.02 - 12.30	135.29 - 128.01	CRI	1E-05
FMS-HG18-10A	Test 2	7.94 - 12.30	132.37 - 128.01	CRI	1E-06
FMS-HG18-11A	Test 1	3.16 - 10.92	159.22 - 151.46	CRI	3E-06
FMS-HG18-13A	Test 1	8.09 - 12.43	143.20 - 138.86	CRI	1E-06
FMS-HG18-14A	Test 1	4.10 - 13.81	112.79 - 103.08	CRI	6E-05
FMS-HG18-14A	Test 2	6.04 - 13.81	110.85 - 103.08	CRI	2E-06
FMS-HG18-14A	Test 3	11.52 - 13.81	105.37 - 103.08	FHT	1E-06
FMS-HG18-15A	Test 1	5.12 - 10.83	102.34 - 96.63	CRI	2E-07
FMS-HG18-16A	Test 1	7.48 – 11.02	134.69 - 131.15	CRI	3E-07

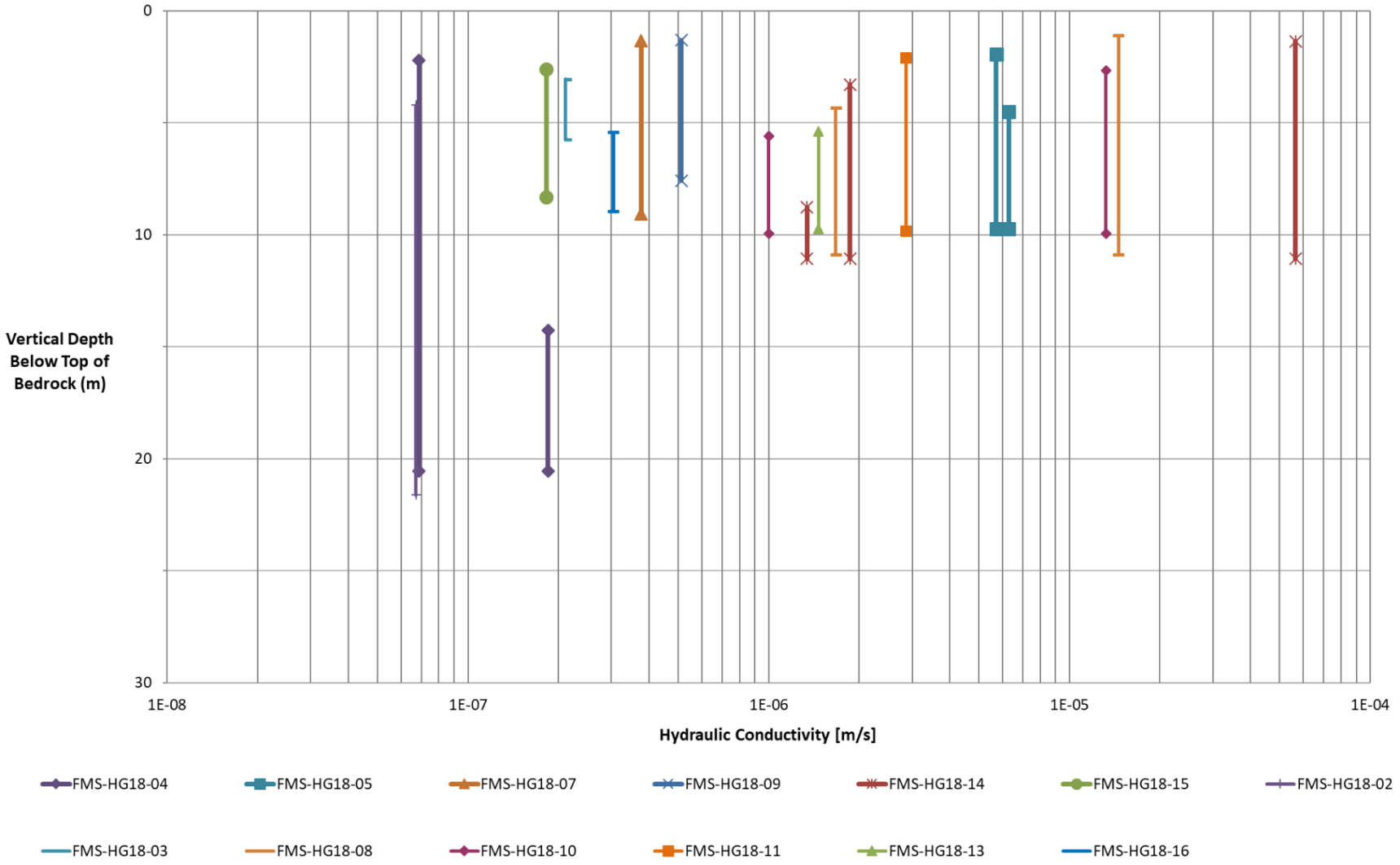

Plate 2: Hydraulic Conductivity Profile for the 2018 Hydrogeological Packer Testing Results

5.3.2 Single Well Response Tests

The results of the rising head SWRT are summarized in Table 8 below, and the analysis sheets are provided in Appendix E. Analyses of the SWRT were carried out using the Hvorslev method (Hvorslev, 1951). The estimated hydraulic conductivities of the 'A' wells installed into the bedrock ranged from 6 x 10^{-8} m/s to 1 x 10^{-5} m/s. The estimated hydraulic conductivities of the 'B' wells installed across the overburden-bedrock interface ranged from 1 x 10^{-7} m/s to 4 x 10^{-5} m/s.

Table 8: Single Well Response Test Summary

Well ID	Top of Test Interval (mbgs)	Bottom of Test interval (mbgs)	Top of Test Interval (m CGVD28)	Bottom of Test Interval (m CGVD28)	Hydraulic Conductivity (m/s)
FMS-HG18-02A	17.36	20.41	118.61	115.56	6E-08
FMS-HG18-02B	3.36	7.03	132.49	128.82	1E-06
FMS-HG18-03A	8.93	11.98	112.65	109.60	3E-07
FMS-HG18-03B	4.42	6.89	117.35	114.88	2E-06
FMS-HG18-04A	14.88	20.98	91.78	85.68	3E-07
FMS-HG18-04B	4.07	7.12	102.60	99.55	1E-07
FMS-HG18-05A	9.17	13.70	104.36	99.83	1E-05
FMS-HG18-05B	2.84	5.89	110.84	107.79	5E-07
FMS-HG18-07A	7.68	10.73	105.30	102.25	1E-06
FMS-HG18-07B	1.71	4.76	111.07	108.02	5E-06
FMS-HG18-08A	10.29	13.34	129.74	126.69	2E-06
FMS-HG18-08B	2.56	5.96	137.42	134.02	9E-06
FMS-HG18-09A	8.98	12.03	114.60	111.55	4E-07
FMS-HG18-09B	3.14	6.19	120.48	117.43	3E-06
FMS-HG18-10A	9.22	12.27	131.09	128.04	5E-07
FMS-HG18-10B	1.90	6.47	138.29	133.72	4E-06
FMS-HG18-11A	7.87	10.92	154.51	151.46	2E-06
FMS-HG18-11B	3.59	4.90	158.82	157.51	1E-06
FMS-HG18-13A	9.38	12.43	141.91	138.86	2E-06
FMS-HG18-13B	2.52	5.57	148.81	145.76	1E-06
FMS-HG18-14A	9.55	12.60	107.34	104.29	3E-06
FMS-HG18-14B	4.74	6.43	112.23	110.54	3E-06

Well ID	Top of Test Interval (mbgs)	Bottom of Test interval (mbgs)	Top of Test Interval (m CGVD28)	Bottom of Test Interval (m CGVD28)	Hydraulic Conductivity (m/s)
FMS-HG18-15A	7.73	10.78	99.73	96.68	4E-07
FMS-HG18-15B	1.03	4.08	106.53	103.48	7E-07
FMS-HG18-16A	7.86	10.91	134.31	131.26	4E-07
FMS-HG18-16B	3.35	5.47	138.84	136.72	4E-05

Note: Test intervals based on well screens except where the static water level was below the top of the screen in which case the static water level was considered the top of the test interval.

5.3.3 Grain Size Estimates

Estimates of hydraulic conductivity of select soil samples were made based on the grain size analyses using the Hazen approximation. A summary of the results is provided in Table 9. The estimates range from 4 x 10^{-9} m/s to 4 x 10^{-6} m/s.

Table 9: Hydraulic Conductivity Estimates Based on Soil Grain Size

Borehole	Sample No.	Representative Sample Depth (mbgs)	Soil Type	D_{10}: Grain size at 10% (wt%) passing (mm)	Estimated Hydraulic Conductivity (m/s)
FMS-HG18-02X	SS2	0.70	SILTY SAND and GRAVEL	0.0140	2E-06
FMS-HG18-03A	SS1	0.31	sandy SILTY GRAVEL	0.0110	1E-06
FMS-HG18-03A	SS3	1.09	sandy SILTY GRAVEL	0.0110	1E-06
FMS-HG18-03A	SS7	3.99	SILTY GRAVEL and SAND	0.0120	1E-06
FMS-HG18-03A	SS8	6.23	SILT, some sand, trace gravel	0.0043	2E-07
FMS-HG18-04A	SS3	2.11	sandy GRAVEL and SILT	0.0007	5E-09
FMS-HG18-04A	SS5	3.69	sandy GRAVEL and SILT	0.0006	4E-09
FMS-HG18-05A	SS1B	0.32	sandy SILTY GRAVEL	0.0170	3E-06
FMS-HG18-05A	SS3	1.84	gravelly SILTY SAND	0.0080	6E-07
FMS-HG18-05A	SS5	3.36	gravelly SAND and SILT	0.0064	4E-07

Borehole	Sample No.	Representative Sample Depth (mbgs)	Soil Type	D_{10}: Grain size at 10% (wt%) passing (mm)	Estimated Hydraulic Conductivity (m/s)
FMS-HG18-06A	SS3	1.84	SILTY SAND and GRAVEL	0.0090	8E-07
FMS-HG18-07A	SS2	0.92	sandy SILTY GRAVEL	0.0110	1E-06
FMS-HG18-07A	SS4	2.75	gravelly SILTY SAND	0.0090	8E-07
FMS-HG18-08A	SS2	0.80	SILTY GRAVEL and SAND	0.0130	2E-06
FMS-HG18-09A	SS3	1.80	sandy SILTY GRAVEL	0.0080	6E-07
FMS-HG18-09A	SS5	4.32	sandy SILTY GRAVEL	0.0095	9E-07
FMS-HG18-10A	SS2	0.92	sandy SILTY GRAVEL	0.0210	4E-06
FMS-HG18-13A	SS3	1.41	gravelly SILTY SAND	0.0090	8E-07
FMS-HG18-14A	SS2	0.84	SILTY GRAVEL and SAND	0.0080	6E-07
FMS-HG18-14A	SS3	1.86	gravelly SILTY SAND	0.0080	6E-07
FMS-HG18-16A	SS1	0.31	gravelly SILTY SAND	0.0024	6E-08
FMS-HG18-16A	SS3	1.64	SILTY GRAVEL and SAND	0.0040	2E-07

5.4 Analytical Results

The following section provides the analytical results for the overburden geochemistry and groundwater quality sampling conducted at FMS.

5.4.1 Overburden

Overburden samples that were collected from selected boreholes at the Project site were submitted to an accredited laboratory to characterize the geochemical characteristics. The sample selection process included samples from boreholes located on lands proposed for infrastructure construction where overburden may be removed and stockpiled. A total of twelve (12) samples were collected and submitted to SGS Canada Ltd. in Lakefield, Ontario, for analysis (Table 10). All samples were submitted for analysis of metals content, and a subset of six samples from boreholes located in or near areas of anticipated overburden removal and stockpiling were submitted for analysis of acid generating and metal leaching potential via acid base accounting and short-term leach analyses.

Table 10: Samples Selected for Overburden Geochemical Analyses

Borehole ID	Sample ID	Depth (m)	Analytical Series		
			Metals	ABA	SFE
FMS-HG18-03A	SS2/SS4	0.61 – 0.66	X		
FMS-HG18-04A	SS1B	0.05 – 0.61	X		
FMS-HG18-05B	OS1	0.00 – 0.61	X		
FMS-HG18-06A	OS2	0.61 – 1.22	X	X	X
FMS-HG18-07A	OS2	0.61 – 1.22	X		
FMS-HG18-08A	SS1	0.00 – 0.61	X		
FMS-HG18-09A	SS1A/SS1B/SS2	0.00 – 0.65	X	X	X
FMS-HG18-10A	SS3	1.45 – 2.03	X	X	X
FMS-HG18-11A	SS2	0.61 – 0.97	X	X	X
FMS-HG18-13A	OS3	1.22 – 1.60	X	X	X
FMS-HG18-14A	SS1	0.00 – 0.61	X	X	X
FMS-HG18-16A	SS2	0.61 – 1.22	X		

5.4.1.1 Geochemical Test Work Methodology

The geochemical test work completed on the twelve overburden samples included the following:

- Bulk metals (elemental analysis)
- Acid-base accounting (ABA)
- Short-term (de-ionized) leach tests

The following sub-section outlines the details of the testing methods, which are consistent with the recommendations of the following recognized documents:

- MEND (Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials 2009)
- Guidelines for Acid Rock Drainage (GARD) Guide (INAP 2013)
- Price (DRAFT Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Mine Sites in British Columbia 1997)

5.4.1.1.1 Bulk Metals

Bulk metals analyses were conducted on all samples to quantify the elemental composition of the materials. Bulk metal analysis determines the concentrations of major and trace elements by a multi-acid leach, followed by an inductively coupled plasma mass spectrometry (ICP-MS) analysis to determine the concentrations of the following

elements: Ag, Al, As, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, U, V, Y, and Zn.

The results of the bulk metal analyses provide a basis for comparison between samples of rock and typical crustal abundances (Price, 1997). Comparison to typical crustal abundances is completed as part of a screening tool to identify materials and site-specific parameters that require further review with respect to environmental significance. It should be noted, however, that high concentrations in the solid-phase does not necessarily identify materials that will be of environmental significance.

5.4.1.1.2 Acid-Base Accounting

ABA measures the bulk quantities of acid generating minerals (e.g., sulphide minerals) and acid neutralizing minerals (e.g., carbonate minerals) to assess whether the materials tested will have sufficient capacity to neutralize the acidity generated through sulphide oxidation or if the materials have the potential to generate acidic effluents. The methodology performed on the samples is a modified Sobek method (Sobek et al., 1978) that includes analysis for paste pH, sulphur species (total sulphur, sulphate content, and sulphide content), acid potential (AP) and neutralization potential (NP), and carbon species (total carbon and carbonate content). Detailed descriptions of the ABA methods are found in MEND (2009).

5.4.1.1.3 Short-term Leach Tests

Short-term leach testing was conducted on all samples to evaluate the metal leaching potential under laboratory conditions. The results of short-term leach tests are commonly used to estimate the potential composition of water that comes into contact with test materials. It is important to note, however, that the results of short-term leach tests do not directly measure the expected effluent chemistry of the test material under ambient conditions due to:

- Relatively small sample size and volume.
- Short duration of the test may not be sufficient to account for representative water-rock interaction times and mineral reaction rates (i.e., sulphide oxidation).
- Enhanced dissolution of some mineral phases due to lab-imposed conditions (i.e., pH, redox, and agitation).

Although there are limitations with the testing, it is a useful indication of the soluble species that can be readily leached from the test materials; as such, it is intended to be used as a screening tool to identify constituents of potential concern.

De-ionized (DI) water leach testing was completed to measure the concentrations of constituents in the sample leachate that are readily soluble in water. The DI water leach method is described in Price (1997) and MEND (2009). Samples are mixed with DI water at a 3:1 liquid to solid ratio in an extraction vessel. The vessel is shaken immediately, and an initial pH is recorded. The slurry is then shaken for 24 hours, after which a final pH is measured and the supernatant is extracted for analysis including the following constituents: conductivity, alkalinity, Cl, NO_3, SO_4, Al, As, Ag, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Si, Sn, Sr, Ti, Tl, U, V, and Zn.

5.4.1.2 Results

The analytical results of the overburden characterization program are included in Appendix F.

5.4.1.2.1 Bulk Metals

Bulk metals analyses were conducted on all twelve samples. Metal concentrations are compared to average crustal abundances, for reference, as recommended by Price (1997). The results of the bulk metals analyses are presented in Appendix F-1 and summarized as follows:

- Arsenic and bismuth concentrations are observed to be greater than 10 times the average crustal abundance in the majority of samples.
- Lead concentrations are observed to be greater than 10 times the average crustal abundance in sample FMS-HG18-06A, OS2.
- Antimony concentrations are observed to be greater than five times the average crustal abundance in two samples.
- All other constituents were detected at concentrations less than five times the average crustal abundance in all samples.

The method detection limit for selenium is greater than ten times the average crustal abundance.

Although the solid-phase concentrations of some metals are greater than the average crustal abundance, such concentrations do not necessarily increase the potential for impacts. However, the parameters identified to have elevated solid-phase concentrations require further consideration.

5.4.1.2.2 Acid-Base Accounting

ABA was completed on six samples. A screening level evaluation of the acid generation potential and neutralization potential was conducted using the interpretation of results of the ABA analysis, which includes determination of the following:

- Paste pH, acid potential (AP), neutralization potential (NP), carbonate NP (CO_3-NP), sulphur species, and carbon species.

Additionally, the potential for acid generation is commonly interpreted according to the ratio of NP to AP (NP/AP), according to the guidelines recommended by MEND (2009) and described in the following table:

Table 11: Acid Generation Potentials Based on NP/AP

Acid Generation Potential	Criteria	Comments
Potentially Acid Generating (PAG)	NP/AP < 1	Potentially acid generating, unless sulphide minerals are non-reactive.
Uncertain	1 ≤ NP/AP ≤ 2	Possibly acid generating if NP is insufficiently reactive or is depleted at a rate faster than sulphides.
Non-Potentially Acid Generating (non-PAG)	NP/AP > 2	Not expected to generate acidity.

Using bulk NP in the NP/AP (NPR) calculation accounts for less reactive silicate minerals, as well as more reactive carbonate minerals. CO_3-NP can also be used in the calculations (CO_3-NPR = CO_3-NP/AP) to account for buffering capacity from carbonate minerals only and ignores the neutralizing capacity of other and more slowly reacting minerals. Therefore, CO_3-NP/AP (CO_3-NPR) is also presented and used in assessing acid generation potentials.

The screening criteria (sulphide content <0.3 wt% as S and paste pH <5.5) and acid potential criteria above are used to evaluate the potential for these materials to be acid generating. The results of the ABA testing program of the waste rock samples are presented in Appendix F-2. The results are summarized as follows:

- Sulphide content was less than 0.3 wt% as S in all samples and ranged from <0.02 to 0.12 wt% as S.
- Total sulphur content ranged from <0.005 to 0.169 wt%.
- Paste pH values were above 5.5 in all samples and ranged from 5.7 to 8.2.
- Acid Potential (AP) values ranged from 0.3 to 3.8 t $CaCO_3$/1000 t (0.6 to 3.7 kg H_2SO_4 / t).
- Neutralization Potential (NP) values ranged from -0.8 to 4.0 t $CaCO_3$/1000 t, while Carbonate Neutralization Potential (CO_3-NP) values ranged from 0.1 to 47 t $CaCO_3$/1000 t.
- Net potential ratios of NPR and CO_3-NPR for all samples ranged from -0.4 to 13 and 0.3 to 21, respectively.

All samples have sulphide and total sulphur contents less than 0.2%, paste pH values above 5.5, and AP values less than 4 t $CaCO_3$/1000 t. Sulphide content in all samples is below the 0.4 wt% and 12.51 kg H_2SO_4/t exemption limits described in Section 5, Subsection A of the Nova Scotia Sulphide Bearing Material Disposal Regulation (N.S. Reg. 57/95). However, applicability of this data with respect to the regulation is dependant upon the actual area and location of overburden to be removed. Low NP values result in NPR values below 2 for some samples; however, based on the low sulphide, sulphur, and AP values, all samples are expected to be non-acid generating.

5.4.1.2.3 Short-term Leach Testing

Short-term leach testing was conducted on six samples. Concentrations of measured parameters and pH values in the leachate were compared to the Canadian Environmental Quality Guidelines (CEQG) for the Protection of Freshwater Aquatic Life (CCME, 2018) for purposes of determining parameters that may need to be further evaluated as part of an overall site water quality prediction. Although the results are compared to regulatory limits and guidelines, it is important to note that these regulatory limits and guidelines do not apply to short-term leach test results, and therefore should not be interpreted within a regulatory context. Rather, these comparisons are conducted herein to qualitatively identify parameters that are leachable from test materials at concentrations that may require further evaluation in the context of the overall water quality effects assessment. The results of the short-term leach test are presented in Appendix F-3 and summarized as follows:

- The pH for all samples ranged from 5.2 to 7.3.
- Nitrate was greater than CEQG (0.05 mg/L) in three samples and ranged from <0.6 to 8.4 mg/L.
- Aluminum was greater than CEQG (pH dependent; 0.005 to 0.1 mg/L) in four samples and ranged from 0.007 to 0.384 mg/L.
- Arsenic was greater than CEQG (0.005 mg/L) in three samples and ranged from 0.0004 to 0.0576 mg/L.
- Copper was greater than CEQG (0.002 mg/L) in two samples and ranged from 0.00050 to 0.00436 mg/L.
- Iron was greater than CEQG (0.3 mg/L) in one sample and ranged from <0.007 to 0.418 mg/L.

- Lead was greater than CEQG (0.001 mg/L) in one sample and ranged from <0.00001 to 0.02091 mg/L.
- Nickel was greater than CEQG (0.025 mg/L) in one sample and ranged from 0.0009 to 0.1640 mg/L.
- Zinc was greater than CEQG (0.007 mg/L) in three samples and ranged from <0.002 to 0.224 mg/L.
- All other parameters were below CEQGs.

5.4.2 Groundwater

All groundwater quality results were compared to the Guidelines for Canadian Drinking Water Quality (CDWQ) and the Nova Scotia Environment Pathway Specific Standards for Groundwater (NSE PSS) for groundwater discharging to surface water (0-10 m from a fresh water body). Groundwater quality results are shown compared to the CDWQ and the NSE PSS in the laboratory results provided in Appendix G. The results of the laboratory analysis are summarized as follows:

- PHC/BTEX and total and free cyanide were not detected in any of the samples collected. Total mercury exceeded the NSE PSS in wells FMS-HG18-06A and FMS-HG18-11B in September 2018, and total and dissolved mercury exceeded the NSE PSS in well FMS-HG18-15A in November 2018. Total and dissolved mercury did not exceed the CDWQ in any samples collected in September 2018, November 2018, March 2019, or June 2019.
- Radium-226 did not exceed the health-related maximum acceptable concentration (MAC) provided in the CDWQ in any of the samples collected in the September 2018, November 2018, March 2019, and June 2019 sampling events.
- Table 12 (below) provides a summary of the groundwater exceedances of the CDWQ MAC for the September 2018, November 2018, March 2019, and June 2019 sampling events:
  - Dissolved arsenic exceeded the CDWQ in seven wells (FMS-HG18-03A, FMS-HG18-04A, FMS-HG18-05A, FMS-HG18-06A, FMS-HG18-07A, FMS-HG18-07B, and FMS-HG18-15A) in September 2018. Dissolved arsenic exceeded the CDWQ in six wells in November 2018, all of which also exceeded in September 2018 (FMS-HG18-03A, FMS-HG18-04A, FMS-HG18-05A, FMS-HG18-07A, FMS-HG18-07B, and FMS-HG18-15A). Dissolved arsenic exceeded the CDWQ in 5 wells (FMS-HG18-02A, FMS-HG18-03A, FMS-HG18-04A, FMS-HG18-05A, and FMS-HG18-06A) in March 2019, all of which exceeded in the 2018 sampling with the exception of FMS-HG18-02A. Dissolved arsenic exceeded CDWQ in six wells (FMS-HG18-02A, FMS-HG18-03A, FMS-HG18-04A, FMS-HG18-05A, FMS-HG18-07A, and FMS-HG18-07B) in June 2019, all of which exceeded in the previous sampling.
  - Dissolved manganese exceeded the CDWQ in 13 wells (FMS-HG18-03A, FMS-HG18-04A, FMS-HG18-04B, FMS-HG18-06A, FMS-HG18-07A, FMS-HG18-07B, FMS-HG18-09A, FMS-HG18-09B, FMS-HG18-11A, FMS-HG18-11B, FMS-HG18-15A, FMS-HG18-15B and FMS-HG18-16A). Health Canada established a guideline for manganese in May 2019. Previous sampling events were not compared to the new Health Canada CDWQ guideline; however, concentrations reported for the June 2019 sampling event are consistent with manganese concentrations from previous sampling events.
  - Aluminum, iron, and zinc exceeded aesthetic objectives/operational guidance value in multiple wells during all monitoring events.

  - Health Canada established new CDWQ MAC guidelines in March 2019 (lead) and June 2019 (copper and strontium). Groundwater results were compared to guidelines in effect at the time of sampling and no results for these parameters exceeded CDWQ MAC. Previous sampling events were not compared to the new Health Canada CDWQ guideline; however, lead, copper, and strontium concentrations reported for the March and June 2019 sampling events are consistent with lead, copper, and strontium concentrations from previous sampling events.
  - No other metals parameters exceeded CDWQ MAC.
- Parameters exceeding the NSE PSS in groundwater for the September 2018, November 2018, March 2019, and June 2019 sampling events are presented in Table 13. Metals parameters exceeding the NSE PSS included total mercury and dissolved aluminum, arsenic, cadmium, cobalt, copper, iron, manganese, mercury, selenium, silver, and zinc. It should be noted that the laboratory detection limit for dissolved cadmium (0.017 µg/L) is greater than the NSE PSS (0.01 µg/L). Detected concentrations of dissolved cadmium are presented in Table 13.

Table 12: Groundwater Concentrations Exceeding the MAC

Monitoring Well ID	Groundwater Concentrations Exceeding the MAC			
	September 2018	November 2018	March 2019	June 2019
FMS-HG18-02A	None	None	Dissolved arsenic	Dissolved arsenic
FMS-HG18-02B	None	None	None	None
FMS-HG18-03A	Dissolved arsenic	Dissolved arsenic	Dissolved arsenic	Dissolved manganese
FMS-HG18-03B	None	None	None	None
FMS-HG18-04A	Dissolved arsenic	Dissolved arsenic	Dissolved arsenic	Dissolved arsenic and manganese
FMS-HG18-04B	None	None	None	Dissolved manganese
FMS-HG18-05A	Dissolved arsenic	Dissolved arsenic	Dissolved arsenic	Dissolved arsenic
FMS-HG18-05B	None	None	None	None
FMS-HG18-06A	Dissolved arsenic	None	Dissolved arsenic	Dissolved manganese
FMS-HG18-07A	Dissolved arsenic	Dissolved arsenic	Not sampled as well frozen	Dissolved arsenic and manganese
FMS-HG18-07B	Dissolved arsenic	Dissolved arsenic	Not sampled as well frozen	Dissolved arsenic and manganese

Monitoring Well ID	Groundwater Concentrations Exceeding the MAC			
	September 2018	November 2018	March 2019	June 2019
FMS-HG18-08A	None	None	None	None
FMS-HG18-08B	None	None	None	None
FMS-HG18-09A	None	None	None	Dissolved manganese
FMS-HG18-09B	None	None	None	Dissolved manganese
FMS-HG18-10A	None	None	None	None
FMS-HG18-10B	None	None	None	None
FMS-HG18-11A	None	None	None	Dissolved manganese
FMS-HG18-11B	None	None	None	Dissolved manganese
FMS-HG18-13A	None	None	None	None
FMS-HG18-13B	None	None	None	None
FMS-HG18-14A	None	None	None	None
FMS-HG18-14B	None	None	None	None
FMS-HG18-15A	Dissolved arsenic	Dissolved arsenic	Not sampled as well frozen	Dissolved manganese
FMS-HG18-15B	None	None	None	Dissolved manganese
FMS-HG18-16A	None	None	None	Dissolved manganese
FMS-HG18-16B	None	None	None	None

Table 13: Dissolved Groundwater Concentrations Exceeding the NSE PSS

Monitoring Well ID	Dissolved Groundwater Concentrations Exceeding the NSE PSS			
	September 2018	November 2018	March 2019	June 2019
FMS-HG18-02A	Aluminium and arsenic	Aluminium and arsenic	Arsenic and copper	Arsenic and copper
FMS-HG18-02B	Aluminium, iron, and manganese	Aluminium, cadmium, and copper	Aluminum, cadmium, and copper	Aluminum and copper
FMS-HG18-03A	Arsenic	Aluminium and arsenic	Arsenic	Aluminum and arsenic
FMS-HG18-03B	Cadmium, copper, and zinc	Aluminium	Cadmium, copper, and silver	Silver
FMS-HG18-04A	Aluminium, arsenic, and cadmium	Aluminium and arsenic	Arsenic	Aluminum
FMS-HG18-04B	Cadmium, manganese, and zinc	Cadmium, iron, manganese, and zinc	Cadmium, iron, manganese, and zinc	Cadmium and zinc
FMS-HG18-05A	Aluminium, arsenic, and cadmium	Aluminium and arsenic	Arsenic	Aluminum
FMS-HG18-05B	Aluminium, arsenic, and cadmium	Aluminium, cadmium and copper	Aluminum, cadmium, and copper	Aluminum, cadmium, and copper
FMS-HG18-06A	Aluminium, arsenic, iron, manganese, and total mercury	Aluminium and cadmium	Aluminum, arsenic, and iron	Aluminum and cadmium
FMS-HG18-07A	Arsenic	Arsenic	Not sampled as well frozen	Arsenic
FMS-HG18-07B	Aluminium, arsenic, and iron	Aluminium, arsenic, and iron	Not sampled as well frozen	Aluminum, arsenic, and iron
FMS-HG18-08A	None	None	None	None
FMS-HG18-08B	Copper	Aluminium and cadmium	Aluminum	Aluminum, cadmium, and silver

Monitoring Well ID	Dissolved Groundwater Concentrations Exceeding the NSE PSS			
	September 2018	November 2018	March 2019	June 2019
FMS-HG18-09A	None	None	None	None
FMS-HG18-09B	Cadmium, silver, and zinc	Cadmium and copper	Cadmium, copper, and iron	Aluminum, cadmium, copper, and iron
FMS-HG18-10A	Cadmium and zinc	Aluminium	Aluminum	Aluminum
FMS-HG18-10B	Aluminium and cadmium	Aluminium	Aluminum and cadmium	Aluminum
FMS-HG18-11A	Cadmium and manganese	Cadmium and manganese	Cadmium and manganese	Cadmium and manganese
FMS-HG18-11B	Aluminium, cadmium, copper, manganese, and total mercury	Aluminium, cadmium, cobalt, copper, iron, and manganese	Aluminum, cobalt, copper, iron, and manganese	Aluminum, cadmium, cobalt, iron, manganese, and selenium
FMS-HG18-13A	None	Aluminium	Aluminum	None
FMS-HG18-13B	Aluminium, copper, and silver	Aluminium, copper, and silver	Aluminum, cadmium, copper, and silver	Aluminum and silver
FMS-HG18-14A	Arsenic and cadmium	Cadmium	Cadmium	Aluminum
FMS-HG18-14B	Cadmium	Aluminium, cadmium, and copper	Aluminum and cadmium	Aluminum and cadmium
FMS-HG18-15A	Aluminium and arsenic	Aluminium, arsenic, mercury, and total mercury	Not sampled as well frozen	Arsenic
FMS-HG18-15B	None	None	Aluminum	None
FMS-HG18-16A	None	None	Silver	None
FMS-HG18-16B	Aluminium, cadmium, and copper	Aluminium, cadmium, copper, and silver	Aluminum, copper, and silver	Aluminum, cadmium, copper, and silver

6.0 CLOSURE

The information presented in this factual report describes the current understanding of the hydrogeological conditions at the FMS Project site based on existing information and a baseline field investigation, with the objective of supporting the EIS process necessary to develop the Project.

We trust that the above is adequate for your current needs. Should you have any questions, comments, or concerns please do not hesitate to contact the undersigned.

Signature Page

Golder Associates Ltd.

Matt Bowman, B.Sc.
Environmental Scientist

THE ASSOCIATION OF PROFESSIONAL GEOSCIENTISTS OF NOVA SCOTIA est. 1997 0170

Natalie Korczak, M.Sc., P.Geo.
Environmental Specialist

Phyllis McCrindle, M.Sc., P.Geo.
Associate, Senior Hydrogeologist

MB/BT/NK/PM/sb/sm

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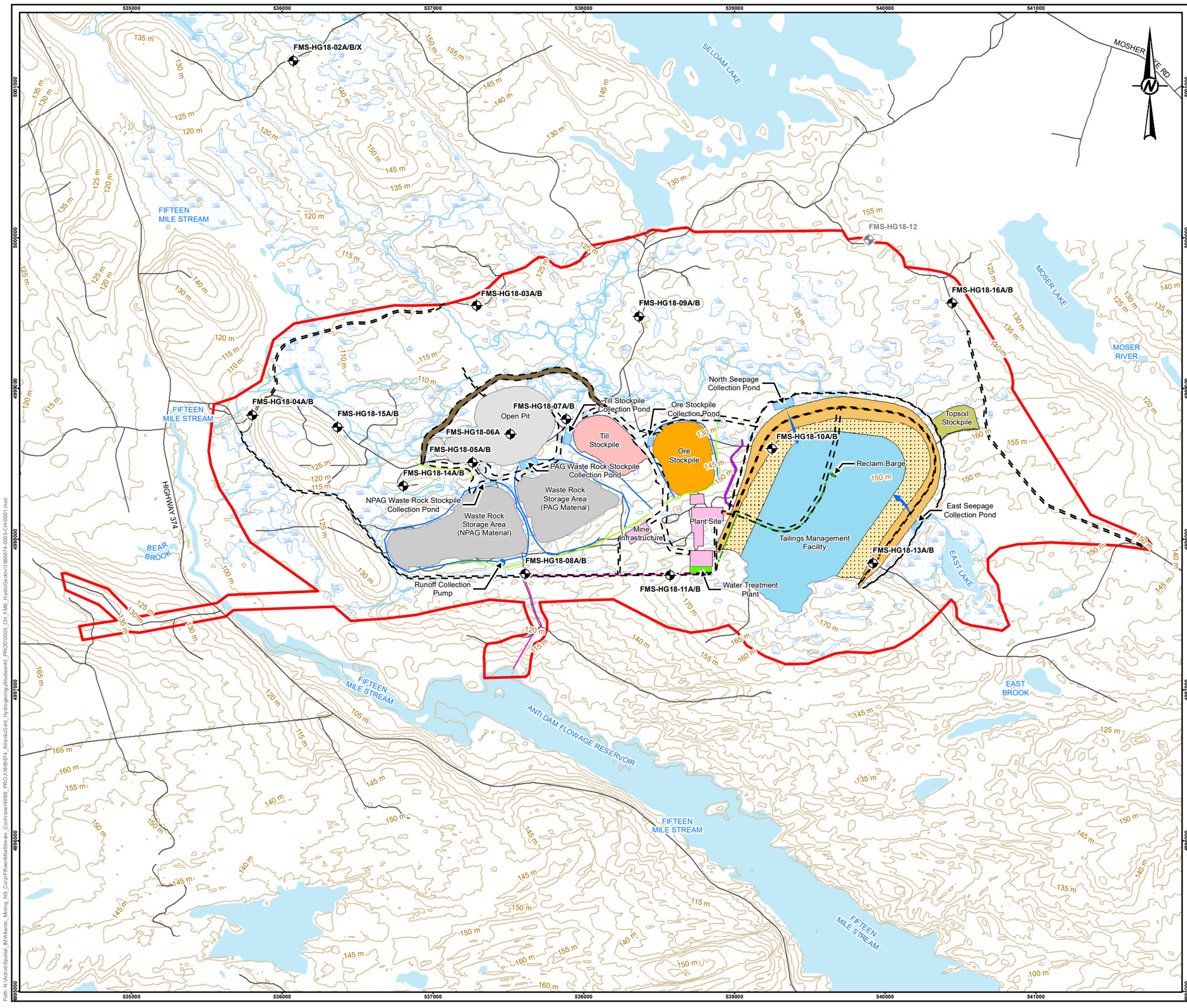


KEY MAP

SCALE 1:5,000,000

LEGEND

- HYDROGEOLOGICAL DRILLING LOCATION
- REMOVED FROM SCOPE
- FIFTEEN MILE STREAM EIS PROJECT AREA
- EXISTING ROAD
- ACCESS ROAD
- TOPOGRAPHIC CONTOUR, 5 METRE INTERVAL
- WATERCOURSE
- WETLAND
- WATERBODY

PROPOSED SITE INFRASTRUCTURE

- DIVERSION DAM
- EMBANKMENT
- OPEN PIT
- ORE STOCKPILE
- PLANT SITE
- POND; COLLECTION PONDS
- RECLAIM BARGE
- RUNOFF COLLECTION SUMP
- SPILLWAY OUTLET CHANNEL
- TAILINGS
- TILL STOCKPILE
- TOPSOIL STOCKPILE
- WASTE ROCK STORAGE
- WATER TREATMENT PLANT
- TAILINGS PIPELINE
- COLLECTION DITCH
- RECLAIM PIPELINE
- NON-CONTACT WATER DITCH
- WATER TREATMENT PIPELINE

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. MCCALLUM ENVIRONMENTAL LTD. EIS PROJECT AREA, (VER.190313, RECEIVED 2019-03-18).
2. MCCALLUM ENVIRONMENTAL LTD. PROPOSED INFRASTRUCTURE, (VER.190620, RECEIVED 2019-06-28).
3. MOOSE MOUNTAIN. TOPOGRAPHIC CONTOURS, EMAILED JULY 17, 2018.
4. THE DRILLING LOCATIONS WERE SURVEYED BY WSP, COORDINATES RECEIVED ON AUGUST 29, 2018.
5. BASE DATA DOWNLOADED FROM NOVA SCOTIA GEOGRAPHIC DATA DIRECTORY, NOVA SCOTIA DEPARTMENT OF NATURAL RESOURCES, 2018.
6. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
7. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83,
COORDINATE SYSTEM: UTM ZONE 20, VERTICAL DATUM: CGVD28

0 200 400 800

1:25,000 METRES

CLIENT
ATLANTIC MINING NS CORP

Atlantic Gold

PROJECT
HYDROGEOLOGICAL INVESTIGATION REPORT
FIFTEEN MILE STREAM GOLD PROJECT

TITLE
DRILLING LOCATIONS AND INFRASTRUCTURE

CONSULTANT
GOLDER

YYYY-MM-DD	2019-09-09
DESIGNED	CM
PREPARED	BR
REVIEWED	SB
APPROVED	PM

PROJECT NO.	CONTROL	REV.	FIGURE
1895674	0003	2	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm 0

Path: N:\Active\Spatial_M\Atlantic_Mining_NS_Corp\FifteenMileStream_Cochrane\H#99_PROJ\1895674_AtlanticGold_Hydrogeology\Studies\40_PROD\0005_CH_FMS_HydroGeo\mxd\1895674-0005-CH-0001.mxd

535000 536000 537000 538000 539000 540000 541000 542000

5001000 5000000 4999000 4998000 4997000 4996000

SILTY DRUMLIN
ORGANIC DEPOSITS
SILTY DRUMLIN
FIFTEEN MILE STREAM
SILTY DRUMLIN
STONY TILL PLAIN
FIFTEEN MILE STREAM
SILTY DRUMLIN
BEAR BROOK
SILTY DRUMLIN
FIFTEEN MILE STREAM
ANTI DAM FLOWAGE RESERVOIR
HIGHWAY 374
FIFTEEN MILE STREAM
FIFTEEN MILE STREAM
SILTY DRUMLIN
SELOAM LAKE
MOSHER LAKE
MOSER LAKE
MOSER RIVER
ORGANIC DEPOSITS
EAST LAKE
EAST BROOK
BEDROCK

FMS-HG18-02A/B/X
FMS-HG18-12
FMS-HG18-03A/B
FMS-HG18-09A/B
FMS-HG18-16A/B
FMS-HG18-04A/B
FMS-HG18-15A/B
FMS-HG18-06A
FMS-HG18-07A/B
FMS-HG18-10A/B
FMS-HG18-05A/B
FMS-HG18-14A/B
FMS-HG18-08A/B
FMS-HG18-11A/B
FMS-HG18-13A/B

KEY MAP

SCALE 1:5,000,000

LEGEND

- HYDROGEOLOGICAL DRILLING LOCATION
- REMOVED FROM SCOPE
- FIFTEEN MILE STREAM EIS PROJECT AREA
- EXISTING ROAD
- WATERCOURSE
- WETLAND
- WATERBODY

SURFICIAL GEOLOGY

- BEDROCK - BEDROCK OF VARIOUS TYPES AND AGES; GLACIALLY SCOURED BASINS AND KNOBS, OVERLAIN BY THIN, DISCONTINUOUS VENEER OF STONY TILL
- ORGANIC DEPOSITS - SPHAGNUM MOSS, PEAT, GYTTJA, CLAY
- SILTY DRUMLIN - SILTIER TILL, HIGHER PERCENTAGE OF DISTANT SOURCE MATERIAL INCLUDING RED CLAY
- STONY TILL PLAIN - STONY, SANDY MATRIX, MATERIAL DERIVED FROM LOCAL BEDROCK SOURCES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. MCCALLUM ENVIRONMENTAL LTD. EIS PROJECT AREA, (VER.190313, RECEIVED 2019-03-18).
2. THE DRILLING LOCATIONS WERE SURVEYED BY WSP, COORDINATES RECEIVED ON AUGUST 29, 2018.
3. DP ME 36, VERSION 2, 2006. DIGITAL VERSION OF NOVA SCOTIA DEPARTMENT OF NATURAL RESOURCES MAP ME 1992-3, SURFICIAL GEOLOGY MAP OF THE PROVINCE OF NOVA SCOTIA, SCALE 1:500 000, BY R. R. STEA, H. CONLEY AND Y. BROWN, 1992
4. BASE DATA DOWNLOADED FROM NOVA SCOTIA GEOGRAPHIC DATA DIRECTORY, NOVA SCOTIA DEPARTMENT OF NATURAL RESOURCES, 2018.
5. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY
6. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83,
COORDINATE SYSTEM: UTM ZONE 20, VERTICAL DATUM: CGVD28

0 200 400 800
1:25,000 METRES

CLIENT
ATLANTIC MINING NS CORP

Atlantic Gold

PROJECT
HYDROGEOLOGICAL INVESTIGATION REPORT
FIFTEEN MILE STREAM GOLD PROJECT

TITLE
SURFICIAL GEOLOGY

CONSULTANT
GOLDER

YYYY-MM-DD	2019-09-09
DESIGNED	CM
PREPARED	BR
REVIEWED	SB
APPROVED	PM

PROJECT NO.	CONTROL	REV.	FIGURE
1895674	0003	2	**2**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm 0

Path: N:\Active\Spatial_IM\Atlantic_Mining_NS_Corp\FifteenMileStream_Cochrane\MXD\99_PRO\1895674_AtlantisGold_HydrogeologyStudies\40_PROD\0005_CH_FMS_HydroGeo\mxd\1895674-0005-CH-0002.mxd

APPENDIX A

Record of Borehole Logs

Lithological and Geotechnical Rock Description Terminology

CORE CONDITION

Total Core Recovery (TCR): TCR records the total amount of core recovered over the measured length drilled for each core run.

Solid Core Recovery (SCR): SCR is defined as the length of full axial diameter (full circumference) core recovered in a run. The full diameter is defined as the pieces of core not intersected by any fractures.

Rock Quality Designation (RQD): RQD is based on the total cumulative length of sound core recovered in lengths greater than 10 cm (4 inches) as measured along the center line axis of the core from the mid-point of one natural fracture to the mid-point of the next natural fracture.

Note that the Fracture per 0.25 m refers to the sum of naturally broken fractures logged, excluding mechanical breaks. Note that lost core is counted as 1 fracture per cm of lost core length.

Joint Roughness (Jr): Describes the small-scale geometry of the joint surface (Barton, 1974).

Joint Alteration (Ja): This rating distinguishes between fractures which are filled with alteration minerals such as clay, and those which are not (Barton, 1974).

Joint Condition Rating (Jcon): The Joint Condition Rating is a numeral description used in RMR_{76} (Bieniawski, 1976) ranging from 0 to 25 based on the shape, roughness, and infill character observed in a discontinuity.

Hydraulic Conductivity (K): The hydraulic conductivity is a calculated value based on packer testing (falling head tests and constant rate injections) as well as single well response testing (rising/ falling head tests). The packer testing was carried out at the completion of the borehole, with the single well response testing carried out after the installation of standpipe piezometers.

LEGEND (ISRM, BROWN, 1981)

Strength

R1	Very weak rock
R2	Weak rock
R3	Medium strong rock
R4	Strong rock
R5	Very strong rock

Weathering

W1	Fresh
W2	Slightly Weathered
W3	Moderately Weathered
W4	Highly Weathered
W5	Completely Weathered
W6	Residual Soil

Features

Structure Type

BD	Bedding	CO	Contact
FO	Foliation	HBD	Healed Bedding
HCO	Healed Contact	HVN	Healed Vein
JN	Joint	VN	Vein
SH	Shear Zone		

Shape

CU	Curved	IR	Irregular
PL	Planar	ST	Stepped
UN	Undulating		

Roughness

K	Slickensided	PO	Polished
RO	Rough	SM	Smooth

Infill

-	Clean	CT	Coating < 1 mm
IN	Infilling > 1 mm	SA	Slightly Altered
SO	Staining Only		

Infill Type

Bx	Breccia/ Broken Rock	Ca	Calcite
Chl	Chlorite	Cl	Clay
FeOx	Iron Oxide	Gv	Gravel
Go	Gouge	Gv	Gravel
M	Silt	Py	Pyrite
Sa	Sand		

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-02A

SHEET 1 OF 3

LOCATION: N 536074.781; E 5001177.735

DRILLING DATE: August 6, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 45

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
0		GROUND SURFACE		135.97															
		Overburden drilled out. For soil stratigraphy refer to Record of Borehole FMS-HG18-02X		0.00															
				133.35							JN,UN,SM SA,FeOx	2	2	20					
		Slightly weathered, medium bedded, grey, medium with fine grains, moderately porous, medium strong interbedded GREYWACKE-ARGILLITE - Broken core from 2.86 m to 3.19 m		2.62	1						BD,UN,RO SA,FeOx	3	2	22		R3	W2		
					2						BD,UN,SM CT,Chl 1 mm	2	4	16		R3	W2		
											JN,UN,RO IN,Gv 20 mm	3	5	0					
											BD,UN,SM SO,FeOx	2	1	20					
											BD,UN,SM CT,Cl 1 mm	2	4	16					3.56 mbgs Aug. 15, 2018
											BD,UN,SM SO,FeOx	2	1	20					
		- Broken/lost core from 3.75 m to 4.05 m, lost drill fluid circulation			3											R3	W2		
											JN,UN,RO SO,FeOx	3	1	25					
		- Broken core from 4.51 m to 4.83 m																	Bentonite Seal
											BD,UN,SM CT,FeOx 1 mm	2	3	20					
					4						BD,UN,SM CT,FeOx 1 mm	2	3	20		R3	W2		
											BD,UN,SM -	2	1	20					
				129.70															
		Fresh, medium bedded, grey, medium grained, faintly to moderately porous, medium strong to very strong interbedded GREYWACKE-ARGILLITE		6.27															
					5						JN,UN,SM SA,Chl	2	2	20		R4	W1		
											JN,UN,SM -	2	1	20					
					6						SH,PL,K CT,Chl 1 mm	0.5	4	6		R3	W1		
					7											R5	W1		
		CONTINUED NEXT PAGE																	

Rotary Drill
HQ3 Core

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/MA
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-02A

SHEET 2 OF 3

LOCATION: N 536074.781; E 5001177.735

DRILLING DATE: August 6, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 45

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
9		*--- CONTINUED FROM PREVIOUS PAGE ---*																	
		Fresh, medium bedded, grey, medium grained, faintly to moderately porous, medium strong to very strong interbedded GREYWACKE-ARGILLITE			7						JN,PL,RO CT,FeOx 1 mm CO,UN,K SA,Chl	1.5 1.5	3 2	20 6		R5	W1		
10					8						SH,UN,RO CT,Py 1 mm BD,UN,RO - JN,UN,RO CT,Py 1 mm JN,PL,RO CT,Ca 1 mm	3 3 3 1.5	3 1 3 3	22 25 22 20		R3	W1		
				125.20 10.77															
11		Fresh, medium bedded, grey-green, fine with medium grains, faintly to moderately porous, medium strong to strong, interbedded ARGILLITE-GREYWACKE, with rare, intensely micro-defected, vuggy altered zones									BD,UN,SM SO,Py JN,UN,RO SO,Py BD,UN,SM SO,Py	2 3 2	1 1 1	20 25 20					
					9						BD,UN,RO SO,Py BD,UN,SM CT,Ca 1 mm BD,UN,K SA,Py BD,UN,SM - BD,UN,SM SA,Ca BD,UN,RO - BD,UN,SM -	3 2 1.5 2 2 3 2	1 3 2 1 2 1 1	25 20 6 20 20 25 20		R3	W1		Bentonite Seal
12		- Broken core from 12.08 m to 12.24 m									JN,UN,SM CT,Ca 1 mm JN,PL,RO CT,Ca 1 mm	2 1.5	3 3	20 20					
13	Rotary Drill HQ3 Core				10						BD,UN,SM CT,Ca 1 mm JN,UN,RO - JN,UN,RO CT,Ca 1 mm JN,UN,SM - BD,UN,SM -	2 3 3 2 2	3 1 3 1 1	20 25 22 20 20		R3	W1		
14											JN,PL,RO CT,Ca 1 mm	1.5	3	20					
15					11						JN,PL,RO SA,Ca JN,PL,RO SA,Ca BD,PL,RO CT,Chl 1 mm BD,PL,RO SA,Chl	1.5 1.5 1.5 1.5	2 2 4 2	20 20 16 20		R4	W1		14.44 mbgs
											JN,UN,SM - BD,PL,SM CT,Cl 1 mm CO,PL,SM CT,Cl 1 mm CO,PL,SM CT,Cl 1 mm BD,PL,SM -	2 1 1 1 1	1 4 4 4 1	20 12 12 12 16		R3	W1		
16		- Broken/lost core from 15.60 m to 15.87 m			12														Silica Sand
					13						JN,UN,RO -	3	1	25		R4	W1		
17											JN,UN,SM SA,Ca JN,UN,SM CT,Ca 1 mm	2 2	2 3	20 20					
					14						BD,UN,RO CT,CA 1 mm JN,UN,RO -	3 3	3 1	22 25		R3	W1		17.36 mbgs 50 mm Diam. PVC #10 Slot Screen
18											JN,PL,RO CT,Ca 1 mm BD,PL,SM SA,Chl	1.5 1	3 2	20 16					
		CONTINUED NEXT PAGE																	

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/MA
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-02A

SHEET 3 OF 3

LOCATION: N 536074.781; E 5001177.735

DRILLING DATE: August 6, 2018

DATUM: CGVD28

DRILL RIG: CME 45

INCLINATION: -90° AZIMUTH: ---

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
18		*--- CONTINUED FROM PREVIOUS PAGE ---*																	
	Rotary Drill HQ3 Core	Fresh, medium bedded, grey-green, fine with medium grains, faintly to moderately porous, medium strong to strong, interbedded ARGILLITE-GREYWACKE, with rare, intensely micro-defected, vuggy altered zones - Broken core from 18.16 m to 18.27 m			14						BD,UN,RO - JN,PL,RO CT,Ca 1 mm	3 1.5	1 3	25 20		R3	W1		
19		- Broken core from 19.33 m to 19.45 m, drill flush return reduced from full to partial			15						BD,PL,SM - BD,PL,SM CT,Gv 1 mm	1 1	1 3	16 16		R3	W1		
				116.20															
20		Fresh, medium bedded, light grey, medium with fine grains, faintly porous, medium strong to strong, interbedded GREYWACKE-ARGILLITE		19.77							JN,UN,SM SA,Chl	2	2	20					
					16						JN,PL,RO SA,Chl JN,PL,RO SA,Chl JN,PL,RO SO,Chl	1.5 1.5 1.5	2 2 1	20 20 20		R4	W1		20.41 mbgs Silica Sand 21.03 mbgs
21																			
											JN,UN,SM - JN,UN,RO CT,Ca 1 mm JN,CU,RO -	2 3 3	1 3 1	20 22 25					
22					17						JN,UN,SM CT,Gv 1 mm	2	3	20		R4	W1		
											JN,PL,RO CT,Ca 1 mm JN,PL,RO CT,Ca 1 mm	1.5 1.5	3 3	20 20					Bentonite Seal
23																			
					18						BD,UN,SM CT,Gv 1 mm BD,UN,RO -	2 3	3 1	20 25		R3	W1		
24				111.73															
		End of Drillhole		24.24															
25		NOTES: 1. Packer testing (falling head test, constant rate injection) performed from 6.83 m to 24.24 m depth. 2. Single well response testing (rising head test) performed from 17.36 m to 20.41 m depth.																	
26																			
27																			

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/MA
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-02B

SHEET 1 OF 2

LOCATION: N 536073.896; E 5001174.328

DRILLING DATE: August 10, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 45

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRE-NGTH INDEX	WEATH-ERING INDEX	FEATURES	PIEZOMETER
		GROUND SURFACE		135.85															
0		Overburden drilled out. For soil stratigraphy refer to Record of Borehole FMS-HG18-02X		0.00															
1	Rotary Drill / HTW Casing																		Bentonite Seal
2																			1.83 mbgs Silica Sand 2.46 mbgs
3																			3.35 mbgs Aug. 15, 2018
4				131.87															
	Rotary Drill / HQ3 Core	Slightly to moderately weathered, medium bedded, grey, medium with fine grains, moderately porous, medium strong, interbedded GREYWACKE-ARGILLITE - Broken core from 4.40 m to 4.80 m		3.98	1						BD,UN,SM CT,Cl 1 mm BD,UN,SM SA,Chl BD,UN,RO -	2 2 3	4 2 1	16 20 25		R3	W2		
5					2						JN,UN,RO IN,Cl 4 mm BD,UN,SM CT,M 1 mm	3 2	8 4	6 16		R3	W2		50 mm Diam. PVC #10 Slot Screen
		- Broken core from 5.63 m to 5.79 m			3						BD,UN,RO IN,Cl 4 mm BD,PL,RO IN,Cl 4 mm BD,UN,RO SA,Chl	3 1.5 3	8 8 2	6 6 22		R3	W2		
6											BD,UN,SM CT,Gv 1 mm BD,UN,SM SA,FeOx JN,UN,RO CT,Cl 1 mm BD,UN,RO SO,FeOx BD,PL,RO SA,FeOx JN,IR,RO CT,Ca 1 mm	2 2 3 3 1.5 3	3 2 4 1 2 3	20 20 20 25 20 22					
7					4						CO,PL,K SA,FeOx BD,UN,SM CT,Ca 1 mm JN,UN,RO CT,Ca 1 mm	0.5 2 3	2 3 3	6 20 22		R3	W2		7.03 mbgs
					5						BD,UN,SM CT,Ca 1 mm	2	3	20		R3	W2		Silica Sand
8				127.63							CO,PL,SM CT,FeOx 1 mm	1	3	16					
		End of Drillhole NOTE: 1. Single well response testing (rising head test) performed from 2.46 m to		8.22															
9		*CONTINUED NEXT PAGE*																	

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/MA
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-02B

SHEET 2 OF 2

LOCATION: N 536073.896; E 5001174.328

DRILLING DATE: August 10, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 45

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-6} 10^{-5} 10^{-4} 10^{-3})	ROCK STRE-NGTH INDEX	WEATH-ERING INDEX	FEATURES	PIEZOMETER
9		*--- CONTINUED FROM PREVIOUS PAGE ---*																	
		7.03 m depth.																	
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/MA
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF BOREHOLE: FMS-HG18-02X

SHEET 1 OF 3

LOCATION: N 5363075.000 ;E 5001186.000

BORING DATE: August 6-7, 2018

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

DRILL RIG: CME 45

DRILLING CONTRACTOR: Logan Drilling

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	REC. LENGTH (mm) / SA. LENGTH (mm)	BLOWS/0.15m	N VALUE	STANDARD PENETRATION RESISTANCE, N VALUE (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q -, U -)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl)	REMARKS, ADDITIONAL LAB. TESTING & GRAIN SIZE DISTRIBUTION (%)	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE										GR SA SI CL	
0	Rotary Drill / HTW Casing	(SM/GM) SILTY SAND and GRAVEL; brown, contains cobbles and/or boulders (GLACIAL TILL); non-cohesive, dry, compact to very dense		0.00	1	SS	432/610	1, 5, 8, 12	13	13 ■			
		- trace to some organic to 0.61 m depth			2	SS	178/178	50/50/0.03	>50	>50 ■	○	38 42 17 3	Bentonite chips from 0.00 m to 1.66 m
1		Borehole continued on RECORD OF DRILLHOLE FMS-HG18-02X											
2													
3													
4													
5													
6													
7													
8													
9													
10													

DEPTH SCALE

1 : 50

GOLDER

LOGGED: CM/MA

CHECKED: SB

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-02X

SHEET 2 OF 3

LOCATION: N 5363075; E 5001186

DRILLING DATE: August 6-7, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 45

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		BEDROCK SURFACE																	
	Rotary Drill HQ3 Core	Slightly weathered to fresh, medium bedded, grey, medium with fine grains, moderately to faintly porous, medium strong, interbedded GREYWACKE-ARGILLITE - Lost core from 1.38 m to 1.58 m - Broken core from 1.58 m to 1.85 m, lost drill fluid circulation		1.01	1	80 60 40 20	80 60 40 20	80 60 40 20	5 10 15 20	0 30 60 90	BD,IR,SM CT,M 1 mm JN,UN,SM IN,Gv 5 mm	2 2	4 5	16 6		R3	W2		Bentonite chips from 0.00 m to 1.66 m
2					2											R3	W2		Bentonite pellets from 1.66 m to 2.27 m
											JN,UN,SM IN,Cl 6 mm JN,PL,RO SA,FeOx	2 1.5	15 2	0 20					
					3						BD,PL,SM SO,FeOx BD,UN,SM IN,Cl 10 mm BD,ST,RO -	1 2 3	1 15 1	16 0 25		R3	W2		
3											BD,PL,SM SA,FeOx	1	2	16					
		- Broken/lost core from 3.30 m to 3.39 m									SH,UN,SM IN,Cl 30 mm	2	15	0					
		- Lost core from 3.70 m to 3.82 m - Broken/lost core from 3.82 m to 4.01 m																	
4					4						JN,UN,RO SA,FeOx	3	2	22		R3	W2		
											JN,UN,RO SO,FeOx	3	1	25					
5											SH,UN,SM IN,Cl 30 mm	2	15	0					
		- Broken core from 5.28 m to 5.41 m			5											R3	W2		
					6						CO,UN,SM CT,FeOx 1 mm BD,UN,SM -	2 2	3 1	20 20		R3	W2		Cave
6											BD,UN,SM SA,FeOx	2	2	20					
		- Broken core from 6.67 m to 6.75 m			7											R3	W2		
7																			
					8						JN,PL,RO SA,Py BD,UN,SM SA,FeOx BD,PL,RO SO,FeOx BD,PL,RO - JN,PL,RO CT,FeOx 1 mm JN,UN,SM SA,FeOx	1.5 2 1.5 1.5 1.5 2	2 2 1 1 3 2	20 20 20 20 20 20		R3	W2		
8		- Broken core from 8.13 m to 8.39 m																	
					9						JN,UN,SM SA,Py BD,ST,SM CT,Ca 1 mm BD,UN,SM - BD,UN,SM SA,Py BD,PL,RO CT,Ca 1 mm BD,UN,SM SA,Ca BD,PL,SM SA,FeOx	2 2 2 2 1.5 2 1	2 3 1 2 3 2 2	20 20 20 20 20 20 16		R3	W1		
9																			
				9.67	10						JN,UN,SM SA,FeOx	2	2	20		R3	W1		
10		*CONTINUED NEXT PAGE*																	

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/MA
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-02X

SHEET 3 OF 3

LOCATION: N 5363075; E 5001186

DRILLING DATE: August 6-7, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 45

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																	
10	Rotary Drill HQ3 Core	Fresh, medium bedded, grey, medium with fine grains, faintly porous, medium strong to very strong, interbedded GREYWACKE-ARGILLITE			10						BD,PL,RO SO,FeOx JN,UN,SM SA,FeOx BD,UN,SM CT,M 1 mm	1.5 2 2	1 2 4	20 20 16		R3	W1		
11					11						JN,PL,RO CT,Ca 1 mm CO,UN,SM IN,Gv 3 mm BD,UN,SM SA,Py	1.5 2 2	3 4 2	20 6 20		R4	W1		
12											CO,UN,SM -	2	1	20					
13					12						BD,PL,RO SA,Ca BD,PL,RO CT,Ca 1 mm BD,PL,RO CT,Ca 1 mm JN,PL,RO -	1.5 1.5 1.5 1.5	2 3 3 1	20 20 20 20		R5	W1	Cave	
14					13						JN,UN,RO CT,Ca 1 mm BD,UN,SM -	3 2	3 1	22 20		R5	W1		
15											BD,PL,SM SA,Chl JN,PL,RO CT,Ca 1 mm	1 1.5	2 3	16 20					
16					14						CO,PL,K SA,Chl BD,UN,RO CT,Ca 1 mm BD,UN,SM SA,Chl BD,UN,RO CT,Chl 1 mm JN,UN,RO CT,Ca 1 mm CO,UN,RO -	0.5 3 2 3 3 3	2 3 2 4 3 1	6 22 20 20 22 25		R4	W1		
17		End of Drillhole NOTES: 1. Hole lost and abandoned due to squeezing upper rock. 2. Location coordinates approximate (determined by handheld GPS)		16.73															
18																			
19																			

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/MA
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF BOREHOLE: FMS-HG18-03A

SHEET 1 OF 2

LOCATION: N 537293.474 ;E 4999550.326

BORING DATE: August 12-13, 2018

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	REC. LENGTH (mm) / SA. LENGTH (mm)	BLOWS/0.15m	N VALUE	STANDARD PENETRATION RESISTANCE, N VALUE (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl)	REMARKS, ADDITIONAL LAB. TESTING & GRAIN SIZE DISTRIBUTION (%)	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		121.58								GR SA SI CL	
0	Rotary Drill HQ3 Core	FILL - (GM) sandy SILTY GRAVEL; brown; non-cohesive, dry, very dense		0.00	1	SS	550/610	4 28 52	80	80 ■	○	47 32 18 3	
		(GM/SM) sandy SILTY GRAVEL to SILTY GRAVEL and SAND; brown to grey, contains cobbles and/or boulders (GLACIAL TILL); non-cohesive, moist, dense to very dense		120.97 0.61	2	SS	50/50	64 50/0.05	>50	>50 ■			
1					3	SS	260/300	93 105 50/0.00	>155	>155 ■	○	45 34 18 3	
					4	SS	70/70	55/0.08	55	55 ■			
2					5	SS	200/200	28 57/0.05	>50	>50 ■			
3		- OS6 sampled from 3.17 m to 3.78 m depth			6	SS	340/610	16 14 28 40	42	42 ■			Bentonite Seal
4					7	SS	410/410	60 44 72/0.10	>116	>116 ■	○	42 38 17 3	4.48 mbgs Aug. 15, 2018
5													
		(ML) SILT, some sand, trace gravel; brown; non-cohesive, moist, very dense		115.85 5.73									
6				115.26	8	SS	180/180	70 57/0.03	>50	>50 ■	○	3 8 84 5	
		Borehole continued on RECORD OF DRILLHOLE FMS-HG18-03A		6.32									
7		NOTE: 1. "OS" denotes oversized split spoon sample (0.08 m outer diameter)											
8													
9													
10													

DEPTH SCALE

1 : 50

GOLDER

LOGGED: AKV/MA

CHECKED: SB

MIS-BHS 014 1895674.GPJ GAL-MIS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-03A

SHEET 2 OF 2

LOCATION: N 537293.474; E 4999550.326

DRILLING DATE: August 12-13, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		BEDROCK SURFACE	115.26															
7	Rotary Drill HQ3 Core	Slightly weathered, medium bedded, grey, medium to fine grained, faintly porous, medium strong GREYWACKE-ARGILLITE	6.32	1						JN,UN,RO -	3	1	25		R3	W2		
										VN,PL,SM CT,M 1 mm	1	4	12					
										VN,UN,RO -	3	1	25					
										JN,UN,RO -	3	1	25					
										JN,PL,SM SA,FeOx	1	2	16					Bentonite Seal
										JN,UN,RO SO,FeOx	3	1	25					
8										JN,ST,SM SA,FeOx	2	2	20					
										JN,UN,SM CT,FeOx 0.5 mm	2	3	20					
				2						JN,ST,SM CT,FeOx 0.5 mm	2	3	20		R3	W2		8.24 mbgs
										JN,PL,SM SO	1	1	16					
										JN,PL,SM -	1	1	16					Silica Sand
9										JN,UN,SM -	2	1	20					8.93 mbgs
										JN,PL,SM -	1	1	16					
										JN,CU,SM SA,Cl	2	2	20					
										JN,PL,SM -	1	1	16					
										JN,PL,SM CT,FeOx 1 mm	1	3	16					
										JN,PL,SM CT,FeOx	1	3	16					
10				3											R3	W2		
										JN,CU,SM IN,FeOx 2 mm	2	4	6					50 mm Diam. PVC #10 Slot Screen
11										JN,PL,SM CT,FeOx 0.5 mm	1	3	16					
										JN,PL,SM CT,FeOx 0.5 mm	1	3	16					
				4						JN,PL,SM CT,FeOx 0.5 mm	1	3	16		R3	W2		
12			109.50															11.98 mbgs
		End of Drillhole	12.08															
		NOTES:																
		1. Packer testing (falling head test) performed from 9.38 m to 12.08 m depth.																
13		2. Single well response testing (rising head test) performed from 8.93 m to 11.98 m depth.																
14																		
15																		

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: AKV/MA
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-03B

SHEET 1 OF 1

LOCATION: N 537290.611; E 4999550.812

DRILLING DATE: August 14, 2018

DATUM: CGVD28

DRILL RIG: CME 75

INCLINATION: -90° AZIMUTH: ---

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		GROUND SURFACE		121.77															
0		Overburden drilled out. For soil stratigraphy refer to Record of Borehole FMS-HG18-03A		0.00															
1																			Bentonite Seal
2																			
3	Rotary Drill HQ3 Core																		3.20 mbgs Silica Sand 3.84 mbgs
4																			4.07 mbgs Aug. 15, 2018
				116.97															
5		Slightly weathered, medium bedded, grey, medium grained, highly to faintly porous, medium strong to strong GREYWACKE - Broken core from 4.80 m to 5.09 m		4.80	1						JN,CU,SM CT,Cl 1 mm JN,UN,SM SA,FeOx JN,UN,SM -	2 2 2	4 2 1	16 20 20		R3	W2		50 mm Diam. PVC #10 Slot Screen
6											JN,PL,SM IN,Cl 3 mm	1	8	6					
7				114.72	2						JN,ST,SM SO,FeOx JN,CU,RO CT,Cl 1 mm	2 3	1 4	20 20		R4	W2		6.89 mbgs
		End of Drillhole NOTE: 1. Single well response testing (rising head test) performed from 3.84 m to 6.89 m depth.		7.05															
8																			
9																			

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: AKV/MA
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF BOREHOLE: FMS-HG18-04A

SHEET 1 OF 4

LOCATION: N 535801.108 ;E 4998824.548

BORING DATE: June 13-14, 2018

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	REC. LENGTH (mm) / SA. LENGTH (mm)	BLOWS/0.15m	N VALUE	STANDARD PENETRATION RESISTANCE, N VALUE (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q -, U -)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl)	REMARKS, ADDITIONAL LAB. TESTING & GRAIN SIZE DISTRIBUTION (%)	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		106.66								GR SA SI CL	
0	Rotary Drill, HTW Casing	TOPSOIL - (PT) Fibrous PEAT; dark brown; non-cohesive, dry, loose		0.00	1A			6					
		FILL - (ML/GM) sandy SILT and GRAVEL; brown, contains organic matter, cobbles and/or boulders; non-cohesive, dry, loose		0.05	1B	SS	203/610	3 2 10	5	5			
				105.85	2-1	SS	0/76	50/0.08	>50	>50			
1		(GM) sandy SILTY GRAVEL; grey, contains cobbles and/or boulders; non-cohesive, wet, dense to very dense		0.81	2	SS	152/229	17 50/0.08	>50	>50			
					3-1	SS	0/330	16 17 50/0.03	>67	>67			
				105.06									
2		(GM/ML) sandy GRAVEL and SILT; reddish brown, with occasional cobbles and/or boulders (GLACIAL TILL); non-cohesive, moist, compact to very dense - OS3 sampled from 1.81 m to 2.41 m depth		1.60	3	SS	330/610	12 16 20 21	36	36		33 26 25 16	1.98 mbgs Aug. 15, 2018
3					4	SS	356/610	12 12 13 27	25	25			
4					5	SS	330/610	12 19 24 22	43	43		31 29 23 17	
					6	SS	533/610	17 20 17 21	37	37			
5					7	SS	229/229	18 50/0.08	>50	>50			Bentonite Seal
				101.47									
6		Borehole continued on RECORD OF DRILLHOLE FMS-HG18-04A NOTE: 1. "OS" denotes oversized split spoon sample (0.08 m outer diameter)		5.19									
7													
8													
9													
10													

DEPTH SCALE

1 : 50

GOLDER

LOGGED: CM/CDM/KL

CHECKED: SB

MIS-BHS 014 1895674.GPJ GAL-MIS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-04A

SHEET 2 OF 4

LOCATION: N 535801.108; E 4998824.548

DRILLING DATE: June 13-14, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		BEDROCK SURFACE		101.47															
	Rotary Drill HQ3 Core	Slightly weathered, thinly bedded, dark grey, fine grained, moderately to slightly porous, medium strong mudstone ARGILLITE		5.19							JN,IR,RO IN,Cl 3 mm	3	8	6					
											BD,UN,SM CT,Cl 1 mm	2	4	16					
											JN,PL,SM CT,Cl 1 mm	1	4	12					
											BD,PL,SM CT,Cl 1 mm	1	3	16					
					1						JN,PL,SM CT,FeOx 1 mm					R3	W2		
6											JN,UN,SM -	2	1	20					
											BD,PL,SM IN,Cl 3 mm	1	8	6					
											JN,PL,SM SA,FeOx	1	2	16					
											BD,UN,SM IN,FeOx 3 mm	2	4	6					
											JN,UN,SM SA,FeOx	2	2	20					
											JN,UN,SM CT,M 1 mm	2	4	16					
7											BD,PL,SM SA,FeOx	1	2	16					
											BD,PL,SM -	1	1	16					
					2						BD,PL,SM -	1	1	16		R3	W2		
											BD,PL,SM -	1	1	16					
				98.84															
		Slightly weathered, thinly to medium bedded, grey, fine with medium grains, slightly porous, medium strong, interbedded ARGILLITE-GREYWACKE		7.82															
8											BD,UN,SM -	2	1	20					
					3						BD,UN,SM CT,Bx 1 mm	2	3	20		R3	W2		
9											BD,UN,SM -	2	1	20					
				97.34							BD,PL,RO -	1.5	1	20					
		Slightly weathered, thinly to medium bedded, grey-green, fine and medium grained, slightly to moderately porous, weak to medium strong, interbedded silicified ARGILLITE-GREYWACKE		9.32															Bentonite Seal
10											BD,PL,SM -	1	1	16					
					4						BD,PL,SM -	1	1	16		R3	W2		
											BD,UN,SM CT,Chl 1 mm	2	4	16					
		- Mechanical broken core from 10.67 m to 10.82 m									BD,PL,SM -	1	1	16					
11											BD,PL,SM -	1	1	16					
											BD,PL,SM -	1	1	16					
											BD,UN,SM -	2	1	20					
											BD,UN,SM -	2	1	20					
					5						VN,PL,SM SA,Ca	1	2	16		R2	W2		
											VN,UN,SM SA,Ca	2	2	20					
											BD,UN,SM -	2	1	20					
											BD,UN,SM SA,Ca	2	2	20					
12											BD,UN,SM -	2	1	20					
											BD,UN,SM CT,M 1 mm	2	4	16					
		- Mechanical broken core from 12.09 m to 12.42 m																	
											JN,UN,RO -	3	1	25					
											JN,UN,RO CT,Bx 1 mm	3	3	22					
13					6						CO,UN,SM IN,M 3 mm	2	4	6		R3	W2		
											BD,PL,SM SA,Ca	1	2	16					
											BD,UN,SM SA,M	2	2	20					
		- Broken core from 13.62 m to 13.68 m, Drill flush return reduced from full to partial																	13.72 mbgs
14					7						BD,UN,SM -	2	1	20		R2	W2		Silica Sand
											BD,PL,SM SA,M	1	2	16					
		CONTINUED NEXT PAGE																	

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/CDM/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-04A

SHEET 3 OF 4

LOCATION: N 535801.108; E 4998824.548

DRILLING DATE: June 13-14, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																	
15	Rotary Drill HQ3 Core	Slightly weathered, thinly to medium bedded, grey-green, fine and medium grained, slightly to moderately porous, weak to medium strong, interbedded silicified ARGILLITE-GREYWACKE - Broken core from 14.35 m to 15.25 m			7						BD,CU,SM SA,M BD,UN,SM SA,M	2 2	2 2	20 20		R2	W2		
					8											R2	W2		Silica Sand 14.88 mbgs
16					9						CO,UN,RO CT,Bx 1 mm JN,UN,RO SA,M	3 3	3 2	22 22		R2	W2		
					10						JN,UN,SM CT,Bx 1 mm JN,UN,RO -	2 3	3 1	20 25		R3	W2		
17		- Broken core from 15.78 m to 16.22 m									JN,UN,RO CT,Ca 1 mm JN,UN,RO CT,Ca 1 mm JN,UN,RO SA,Ca	3 3 3	3 3 2	22 22 22					
				89.23	11						JN,CU,RO -	3	1	25		R3	W2		
		Fresh, thinly bedded, grey to dark grey, fine with medium grains, slightly to faintly porous, weak to medium strong, interbedded ARGILLITE-GREYWACKE		17.43							CO,UN,SM SA,Chl BD,UN,SM - BD,PL,SM - JN,UN,SM - BD,UN,SM -	2 2 1 1 2 2	2 1 1 1 1 1	20 20 16 16 20 20					50 mm Diam. PVC #10 Slot Screen
18											BD,PL,SM -	1	1	16					
											BD,UN,SM SA,Ca	2	2	20					
					12						BD,UN,SM CT,Bx 1 mm	2	3	20		R3	W1		
19											JN,PL,SM CT,Cl 1 mm	1	4	12					
				87.12															
		Fresh, medium bedded, green-grey, medium grained, moderately to slightly porous, medium to very strong, silicified GREYWACKE		19.54							JN,UN,RO CT,Ca 1 mm	3	3	22					
20					13											R3	W1		
											VN,UN,RO CT,Ca 1 mm	3	3	22					
21		- Broken core from 20.91 m to 21.07 m																	20.98 mbgs
											VN,PL,RO CT,Ca 1 mm	1.5	3	20					
					14						JN,IR,RO SA,Chl	3	2	22		R3	W1		
22											JN,PL,K SA,Chl JN,IR,RO CT,Ca 1 mm	0.5 3	2 3	6 22					Silica Sand
					15						JN,UN,RO -	3	1	25		R5	W1		
23																			
		CONTINUED NEXT PAGE																	

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/CDM/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-04A

SHEET 4 OF 4

LOCATION: N 535801.108; E 4998824.548

DRILLING DATE: June 13-14, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRE-NGTH INDEX	WEATH-ERING INDEX	FEATURES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																	
24	Rotary Drill HQ3 Core	Fresh, medium bedded, green-grey, medium grained, moderately to slightly porous, medium to very strong, silicified GREYWACKE			15						JN,UN,RO SO,Py	3	1	25		R5	W1		
											JN,UN,RO SO,Py	3	1	25					
					16						VN,UN,SM CT,Chl 1 mm	2	4	16		R5	W1		
				82.24							HCO,-,- -	4	0.75	25					Silica Sand
25		Fresh, thinly bedded, dark grey and green, fine grained, faintly porous, medium strong, interbedded siltstone and mudstone ARGILLITE		24.42							BD,UN,SM SO,Ca	2	1	20					
											BD,UN,SM SO,Ca	2	1	20					
					17											R3	W1		
											BD,PL,SM -	1	1	16					
											BD,PL,SM -	1	1	16					
											BD,PL,SM -	1	1	16					
				80.92															
26		End of Drillhole		25.74															
		NOTES:																	
		1. Packer testing (falling head test, constant rate injection) performed from 19.46 m to 25.74 m and 7.39 m to 25.74 m depth																	
		2. Single well response testing (rising head test) performed from 14.88 m to 20.98 m depth.																	
27																			
28																			
29																			
30																			
31																			
32																			

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/CDM/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-04B

SHEET 1 OF 1

LOCATION: N 535800.771; E 4998822.675

DRILLING DATE: June 16, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
0		GROUND SURFACE		106.67															
0	Rotary Drill / HWT Casing	Overburden drilled out. For soil stratigraphy refer to Record of Borehole FMS-HG18-04A		0.00															Bentonite Seal
1																			
2																			
3																			2.88 mbgs Aug. 15, 2018
3																			3.35 mbgs
3																			Silica Sand
4																			4.07 mbgs
4				102.13															
4	Rotary Drill / HQ3 Core	Slightly weathered, thinly bedded, grey, fine grained, slightly porous, medium strong ARGILLITE		4.54	1						BD,PL,SM CT,FeOx 1 mm BD,PL,RO IN,FeOx 3 mm BD,PL,SM CT,FeOx 1 mm	1 1.5 1	3 4 3	16 6 16		R3	W2		
5											BD,UN,SM -	2	1	20					
5											BD,PL,RO CT,Py 1 mm	1.5	3	20					
5					2											R3	W2		50 mm Diam. PVC #10 Slot Screen
6											BD,PL,RO -	1.5	1	20					
6											BD,PL,RO -	1.5	1	20					
6											BD,UN,SM SO,FeOx	2	1	20					
6											BD,UN,RO SO,Chl	3	1	25					
6											BD,PL,SM -	1	1	16					
6											JN,UN,RO SO,FeOx	3	1	25					
7					3						BD,UN,RO SO,FeOx	3	1	25		R3	W2		7.12 mbgs
7											JN,PL,RO CT,Py 1 mm	1.5	3	20					Silica Sand
7											BD,PL,SM -	1	1	16					
7				98.88							BD,PL,RO -	1.5	1	20					
7											BD,PL,RO CT,Py 1 mm	1.5	3	20					
8		End of Drillhole		7.79															
8		NOTE: 1. Single well response testing (rising head test) performed from 4.07 m to 7.12 m depth.																	
9																			

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF BOREHOLE: FMS-HG18-05A

SHEET 1 OF 3

LOCATION: N 537263.208 ;E 4998507.475

BORING DATE: May 29-30, 2018

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	REC. LENGTH (mm) / SA. LENGTH (mm)	BLOWS/0.15m	N VALUE	STANDARD PENETRATION RESISTANCE, N VALUE / SHEAR STRENGTH Cu, kPa	HYDRAULIC CONDUCTIVITY, k, cm/s / WATER CONTENT PERCENT	REMARKS, ADDITIONAL LAB. TESTING & GRAIN SIZE DISTRIBUTION (%)	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		113.53								GR SA SI CL	
0	Rotary Drill / H Casing	TOPSOIL - (SM) SILTY SAND; brown; non-cohesive, dry, very loose		0.89	1A			1					
		(GM) sandy SILTY GRAVEL; brown (GLACIAL TILL); non-cohesive, dry, compact to very dense			1B	SS	279 / 610	3 7 21	10	10		51 35 11 3	
					2	SS	229 / 279	21 50/0.13	>50	>50			
1		(SM/ML) gravelly SILTY SAND to gravelly SAND and SILT; brown, contains cobbles and/orboulders (GLACIAL TILL); non-cohesive, wet, very dense		112.64 0.89									
					3	SS	381 / 610	33 29 38 40	67	67		34 41 21 4	
2					4	SS	229 / 381	28 28 50/0.08	>78	>78			2.28 mbgs Aug. 15, 2018
3					5	SS	431 / 610	19 35 31 45	66	66		19 35 42 4	
		(GM) sandy SILTY GRAVEL; grey (GLACIALTILL); non-cohesive, wet, very dense		109.72 3.81 109.47 4.06	6	SS	254 / 254	35 50/0.10	>50	>50			Bentonite Seal
4		Borehole continued on RECORD OF DRILLHOLE FMS-HG18-05A											
5													
6													
7													
8													
9													
10													

STANDARD PENETRATION RESISTANCE, N VALUE: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ● / rem V. ⊕ U - ○; 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6} 10^{-5} 10^{-4} 10^{-3}

WATER CONTENT PERCENT: Wp ⊢ ○ W ⊣ WI; 20 40 60 80

DEPTH SCALE

1 : 50

GOLDER

LOGGED: CM/KL

CHECKED: SB

MIS-BHS 014 1895674.GPJ GAL-MIS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-05A

SHEET 2 OF 3

LOCATION: N 537263.208; E 4998507.475

DRILLING DATE: May 29-30, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		BEDROCK SURFACE	109.47															
		Moderately to slightly weathered, very thinly to thinly bedded, fine to medium grained, faintly porous, medium strong to strong, interbedded ARGILLITE (siltstone and mudstone) - Broken core from 4.06 m to 4.24 m - Broken core from 4.52 m to 4.60 m	4.06	1						JN,UN,SM CT,Cl 1 mm JN,IR,SM CT,Cl 1 mm JN,PL,SM SO,FeOx	2 2 1	4 4 1	16 16 16		R3	W3		
				2						BD,UN,RO SA,FeOx JN,PL,SM SO,FeOx JN,UN,SM CT,M 1 mm	3 1 2	2 1 4	22 16 16		R3	W3		
5										JN,PL,RO SO,FeOx	1.5	1	20					
				3						JN,UN,RO SO,FeOx JN,UN,RO SO,FeOx JN,PL,RO SO,FeOx	3 3 1.5	1 1 1	25 25 20		R3	W2		
6										JN,PL,RO SA,Py JN,UN,RO SO,FeOx	1.5 3	2 1	20 25					Bentonite Seal
										JN,PL,RO - JN,UN,RO -	1.5 3	1 1	20 25					
				4						JN,UN,RO SO,FeOx JN,PL,SM - JN,UN,SM IN,Bx 5 mm BD,UN,RO SO,FeOx HCO,UN,- -	3 1 2 3 4	1 1 5 1 3.75	25 16 6 25 25		R4	W2		
8																		
				5						BD,UN,SM CT,FeOx 1 mm JN,CU,RO CT,FeOx 1 mm JN,PL,SM -	2 3 1	3 3 1	20 22 16		R4	W2		8.23 mbgs Silica Sand
9		- Broken core from 9.10 m to 9.22 m	104.22															9.17 mbgs
		Slightly weathered, very thinly to thickly bedded, grey, fine grained, faintly porous, strong banded ARGILLITE siltstone (with mudstone folded banding/foliation)	9.31							JN,UN,SM SA,FeOx BD,IR,RO SA,FeOx	2 3	2 2	20 22					
										BD,UN,SM -	2	1	20					
10				6						BD,UN,SM SO,FeOx BD,UN,RO - BD,UN,SM SO,FeOx BD,UN,RO SO,Py JN,IR,RO SO,FeOx JN,PL,SM SA,FeOx	2 3 2 3 3 1	1 1 1 1 1 2	20 25 20 25 25 16		R3	W2		
										JN,UN,SM SO,Py BD,IR,SM SA,FeOx	2 2	1 2	20 20					
11																		50 mm Diam. PVC #10 Slot Screen
				7						JN,PL,RO SA,FeOx JN,PL,RO SO,Py	1.5 1.5	2 1	20 20		R4	W2		
12										VN,UN,RO CT,Cl 1 mm	3	4	20					
				8						JN,CU,RO SO,FeOx JN,UN,RO SA,FeOx	3 3	1 2	25 22		R4	W2		
13		*CONTINUED NEXT PAGE*																

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-05A

SHEET 3 OF 3

LOCATION: N 537263.208; E 4998507.475

DRILLING DATE: May 29-30, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRE-NGTH INDEX	WEATH-ERING INDEX	FEATURES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																	
	Rotary Drill / HQ3 Core	Slightly weathered, very thinly to thickly bedded, grey, fine grained, faintly porous, strong banded ARGILLITE siltstone (with mudstone folded banding/foliation)			8						JN,UN,RO CT,FeOx 1 mm SH,UN,RO CT,FeOx 1 mm	3 3	3 3	22 22		R4	W2		50 mm Diam. PVC #10 Slot Screen 13.50 mbgs
				99.72															
		End of Drillhole		13.81															
14		NOTES:																	
		1. Packer testing (falling head test, constant rate injection) performed from 6.00 m to 13.81 m and 8.57 m to 13.81 m depth.																	
15		2. Single well response testing (rising head test) performed from 9.17 m to 13.7 m depth.																	
16																			
17																			
18																			
19																			
20																			
21																			
22																			

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-05B

SHEET 1 OF 1

LOCATION: N 537262.405; E 4998509.096

DRILLING DATE: June 1, 2018

DATUM: CGVD28

DRILL RIG: CME 75

INCLINATION: -90° AZIMUTH: ---

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
0		GROUND SURFACE		113.68															
0	Rotary Drill / HWT Casing	Overburden drilled out. For soil stratigraphy refer to Record of Borehole FMS-HG18-05A		0.00															Bentonite Seal 2.09 mbgs 2.09 mbgs Aug. 15, 2018 Silica Sand 2.84 mbgs
4				109.44															
4	Rotary Drill / HQ3 Core	Slightly weathered, thinly bedded, medium grained, grey, faintly porous, medium strong to strong ARGILLITE siltstone		4.24	1						JN,PL,RO SO,FeOx JN,PL,SM -	1.5 1	1 1	20 16		R3	W2		50 mm Diam. PVC #10 Slot Screen
5											JN,PL,RO CT,FeOx 1 mm JN,PL,RO SA,FeOx JN,PL,RO SA,FeOx HBD,PL,RO -	1.5 1.5 1.5 4	3 2 2 0.75	20 20 20 25					
6					2						JN,UN,RO SO,FeOx JN,UN,RO SO,FeOx JN,UN,RO SO,Py	3 3 3	1 1 1	25 25 25		R4	W2		5.89 mbgs Silica Sand
6				107.32															
6		End of Drillhole NOTE: 1. Single well response testing (rising head test) performed from 2.84 m to 5.89 m depth.		6.36															

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF BOREHOLE: FMS-HG18-06A

SHEET 1 OF 2

LOCATION: N 537513.226 ;E 4998697.251

BORING DATE: June 2, 2018

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	REC. LENGTH (mm) / SA. LENGTH (mm)	BLOWS/0.15m	N VALUE	STANDARD PENETRATION RESISTANCE, N VALUE (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q -, U -)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl)	REMARKS, ADDITIONAL LAB. TESTING & GRAIN SIZE DISTRIBUTION (%)	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		111.97								GR SA SI CL	
0	Power Auger 102 mm Diam. (Solid Stem)	FILL - ASPHALT, ORGANICS, GRAVEL and SILT; non-cohesive, dry, loose to dense		0.00	1	SS	305/457	5 5 45	50	50			Bentonite Seal
				111.31									
1		(SM/GM) SITY SAND and GRAVEL; brown (GLACIAL TILL); non-cohesive, moist to wet, loose to compact - OS2 sampled from 0.61 m to 1.22 m depth		0.66	2A 2B	SS	356/610	11 5 4 6	9	9			Native Backfill
2					3	SS	356/610	9 11 11 10	22	22	○	35 38 25 2	1.41 mbgs Aug. 15, 2018
					4	SS	356/610	15 14 12 20	26	26			
3		Borehole continued on RECORD OF DRILLHOLE FMS-HG18-06A		109.01 2.96									
4		NOTE: 1. "OS" denotes oversized split spoon sample (0.08 m outer diameter)											
5													
6													
7													
8													
9													
10													

DEPTH SCALE

1 : 50

GOLDER

LOGGED: CM/KL

CHECKED: SB

MIS-BHS 014 1895674.GPJ GAL-MIS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-06A

SHEET 2 OF 2

LOCATION: N 537513.226; E 4998697.251

DRILLING DATE: June 2, 2018

DATUM: CGVD28

DRILL RIG: CME 75

INCLINATION: -90° AZIMUTH: ---

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		BEDROCK SURFACE		109.01															
3	Rotary Drill HQ3 Core	Moderately to slightly weathered, thinly bedded, dark grey, fine grained, slightly porous, medium strong mudstone ARGILLITE - Broken core from 2.96 m to 3.09 m - Broken core from 3.41 m to 3.47 m		2.96	1						BD,PL,RO CT,FeOx 1 mm BD,CU,RO CT,FeOx 1 mm JN,UN,RO CT,FeOx 1 mm JN,PL,RO CT,FeOx 1 mm BD,UN,RO CT,FeOx 1 mm BD,UN,RO CT,FeOx BD,UN,RO SA,FeOx JN,UN,RO SA,FeOx BD,PL,RO SA,FeOx BD,PL,SM SA,FeOx	1.5 3 3 1.5 3 3 3 1.5 1	3 3 3 3 3 3 2 2 2	20 22 22 20 22 22 22 20 16		R3	W3		3.33 mbgs
4		- Broken core from 3.92 m to 4.10 m			2						BD,PL,SM SO,FeOx BD,PL,RO SA,Py BD,UN,RO SO,Py BD,PL,SM SO,Py	1 1.5 3 1	1 2 1 1	16 20 25 16		R3	W2		
5					3						BD,UN,SM SO,FeOx JN,UN,RO SO,Py BD,UN,RO SO,Py	2 3 3	1 1 1	20 25 25		R3	W2		50mm Diam. PVC #10 Slot Screen
6		- Broken core from 5.26 m to 5.42 m, flush return low from upper borehole, reductions often full loss of circulation below this fracture			4						JN,UN,RO SO,Py BD,UN,SM SA,FeOx BD,UN,SM - BD,PL,RO SO,Py JN,UN,RO SO,Py BD,PL,RO SA,FeOx BD,PL,RO SO,Py BD,UN,SM - BD,UN,SM SO,FeOx	3 2 2 1.5 3 1.5 1.5 2 2	1 1 1 1 1 2 1 1 1	25 20 20 20 25 20 20 20 20		R3	W2		
7		VOID - Inferred mine opening, silt at bottom (likely drill cuttings from exploration drilling, no recovery)		6.32 105.65	5											R3	W2		6.86 mbgs Cave
8				103.61															
		End of Drillhole		8.36															
9																			
10																			
11																			

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF BOREHOLE: FMS-HG18-07A

SHEET 1 OF 3

LOCATION: N 537889.273 ;E 4998795.880

BORING DATE: June 3, 2018

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	REC. LENGTH (mm) / SA. LENGTH (mm)	BLOWS/0.15m	N VALUE	STANDARD PENETRATION RESISTANCE, N VALUE / SHEAR STRENGTH Cu, kPa	HYDRAULIC CONDUCTIVITY, k, cm/s / WATER CONTENT PERCENT	REMARKS, ADDITIONAL LAB. TESTING & GRAIN SIZE DISTRIBUTION (%)	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		112.98								GR SA SI CL	
	Rotary Drill, H Casing	TOPSOIL - (PT) Fibrous PEAT; dark brown; non-cohesive, wet, very loose		0.00 / 0.06	1A			1					
		(GM/SM) sandy SILTY GRAVEL to gravelly SILTY SAND; grey brown (GLACIAL TILL); non-cohesive, wet, compact to very dense			1B	SS	229 / 610	7 6 17	13	13			0.45 mbgs Aug. 15, 2018
1		- OS2 sampled from 0.61 m to 1.22 m depth			2	SS	330 / 610	11 13 14 12	27	27		50 28 19 3	
2					3	SS	203 / 610	21 24 14 17	38	38			
3					4	SS	406 / 610	21 26 18 30	44	44		31 40 26 3	
				109.68	5	SS	50 / 102	50/0.10	>50	>50			Bentonite Seal
		Borehole continued on RECORD OF DRILLHOLE FMS-HG18-07A		3.3									
4		NOTE: 1. "OS" denotes oversized split spoon sample (0.08 m outer diameter)											
5													
6													
7													
8													
9													
10													

STANDARD PENETRATION RESISTANCE, N VALUE: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ● / rem V. ⊕ U - ○; 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6} 10^{-5} 10^{-4} 10^{-3}

WATER CONTENT PERCENT: Wp — W — Wl; 20 40 60 80

DEPTH SCALE

1 : 50

GOLDER

LOGGED: CM/KL

CHECKED: SB

MIS-BHS 014 1895674.GPJ GAL-MIS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-07A

SHEET 2 OF 3

LOCATION: N 537889.273; E 4998795.88

DRILLING DATE: June 3, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRE-NGTH INDEX	WEATH-ERING INDEX	FEATURES	PIEZOMETER
		BEDROCK SURFACE		109.68															
		Slightly weathered to fresh, thinly to very thinly bedded, dark grey, faintly porous, medium strong, banded ARGILLITE (mudstone and siltstone)		3.30	1						BD,PL,RO -	1.5	1	20		R3	W2		
											BD,PL,SM -	1	1	16					
											SH,PL,RO IN,Cl 4 mm	1.5	8	6					
											BD,PL,RO -	1.5	1	20					
4					2						JN,UN,RO CT,Cl 1 mm	3	4	20		R3	W2		
											BD,UN,SM CT,Py 1 mm	2	3	20					
											BD,UN,RO SO,Py	3	1	25					
					3						BD,UN,RO -	3	1	25		R3	W2		
5																			
											VN,UN,RO CT,Py 1 mm	3	3	22					Bentonite Seal
					4											R3	W1		
											BD,UN,RO -	3	1	25					
6											BD,UN,SM CT,Cl 1 mm	2	4	16					
											JN,CU,RO SA,Chl	3	2	22					
				106.43															
		Fresh, medium bedded, green grey and dark grey, fine grained, faintly porous, weak mudstone and medium strong siltstone banded ARGILLITE		6.55							HCO,UN,- -	4	0.75	25					
											SH,UN,RO IN,Cl 3 mm	3	8	6					
											BD,UN,RO SO,Py	3	1	25					
											BD,PL,RO -	1.5	1	20					
7											BD,PL,RO SO,Py	1.5	1	20					
											BD,UN,RO -	3	1	25					7.01 mbgs
					5											R2	W1		
											BD,UN,RO CT,Cl 1 mm	3	4	20					Silica Sand
											BD,PL,RO -	1.5	1	20					
											BD,PL,RO -	1.5	1	20					7.68 mbgs
	Rotary Drill										VN,UN,RO CT,Py 1 mm	3	3	22					
8	HQ3 Core	- Broken core from 7.93 m to 8.01 m																	
											JN,UN,RO CT,Chl 1 mm	3	4	20					
											CO,IR,RO CT,Py 1 mm	3	3	22					
											BD,PL,RO SA,Py	1.5	2	20					
					6											R3	W1		
											CO,PL,SM SA,Py	1	2	16					
9											JN,UN,RO CT,Py	3	3	22					
																			50 mm Diam. PVC #10 Slot Screen
				103.37							JN,PL,RO CT,Ca 1 mm	1.5	3	20					
		Fresh, medium bedded, light grey, medium grained, faintly porous, strong GREYWACKE		9.61							HCO,-,- -	4	0.75	25					
											JN,PL,RO -	1.5	1	20					
10					7						JN,PL,RO CT,Ca 1 mm	1.5	3	20		R4	W1		
											JN,UN,RO CT,Ca 1 mm	3	3	22					
																			10.73 mbgs
11											JN,UN,RO CT,Ca 1 mm	3	3	22					
											JN,UN,SM SO,Py	2	1	20					Silica Sand
					8											R4	W1		
											JN,PL,RO SA,Chl	1.5	2	20					
12											JN,UN,RO SO,Py	3	1	25					
		CONTINUED NEXT PAGE																	

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE

1 : 50

GOLDER

LOGGED: CM/KL

CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-07A

SHEET 3 OF 3

LOCATION: N 537889.273; E 4998795.88

DRILLING DATE: June 3, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-6} 10^{-5} 10^{-4} 10^{-3})	ROCK STRE-NGTH INDEX	WEATH-ERING INDEX	FEATURES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																	
				190.61 / 12.37							JN,PL,RO SA,Chl	1.5	2	20					
		End of Drillhole																	
		NOTES:																	
13		1. Packer testing (falling head test, constant rate injection) performed from 4.65 m to 12.37 m depth.																	
		2. Single well response testing (rising head test) performed from 7.68 m to 10.73 m depth.																	
14																			
15																			
16																			
17																			
18																			
19																			
20																			
21																			

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-07B

SHEET 1 OF 1

LOCATION: N 537883.789; E 4998796.171

DRILLING DATE: June 5, 2018

DATUM: CGVD28

DRILL RIG: CME 75

INCLINATION: -90° AZIMUTH: ---

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		GROUND SURFACE		112.78															
0	Rotary Drill / H Casing	Overburden drilled out. For soil stratigraphy refer to Record of Borehole FMS-HG18-07B		0.00															Bentonite Seal 0.29 mbgs Aug. 15, 2018 0.91 mbgs Silica Sand 1.71 mbgs
1																			
2																			
3				109.52															50 mm Diam. PVC #10 Slot Screen
4	Rotary Drill / HQ3 Core	Slightly weathered, medium bedded, grey, medium grained, faintly porous, medium strong ARGILLITE - Broken core from 3.39 m to 3.66 m, drill flush return colour changed to brown, no change in volume		3.26	1											R3	W2		
					2						JN,UN,SM CT,Ca 1 mm JN,UN,SM - JN,UN,RO SA,Ca JN,PL,RO CT,Ca 1 mm JN,UN,RO SO,Py JN,PL,RO IN,Cl 6 mm JN,UN,RO -	2 2 3 1.5 3 1.5 3	3 1 2 3 1 15 1	20 20 22 20 25 0 25		R3	W2		
				107.93															4.78 mbgs
5		End of Drillhole NOTE: 1. Single well response testing (rising head test) performed from 1.71 m to 4.76 m depth.		4.85															
6																			
7																			
8																			
9																			

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF BOREHOLE: FMS-HG18-08A

SHEET 1 OF 3

LOCATION: N 537612.690 ;E 4997771.114

BORING DATE: July 30-31, 2018

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	REC. LENGTH (mm) / SA. LENGTH (mm)	BLOWS/0.15m	N VALUE	STANDARD PENETRATION RESISTANCE, N VALUE (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q -, U -)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl)	REMARKS, ADDITIONAL LAB. TESTING & GRAIN SIZE DISTRIBUTION (%)	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		140.03								GR SA SI CL	
0	Rotary Drill, HW Casing	FILL - (GM/SM) SILTY GRAVEL and SAND; grey; non-cohesive, dry, compact to very dense		0.00	1	SS	330 / 610	1 7 8 14	15	15			
				139.05	2	SS	279 / 381	19 27 50/0.08	>77	>77		43 39 16 2	
1		(GM) sandy SILTY GRAVEL; grey, contains frequent cobbles and/or boulders (GLACIAL TILL); non-cohesive, wet, dense to very dense		0.98									Bentonite Seal
2					3	SS	50 / 102	50/0.03	>50	>50			2.60 mbgs Aug. 15, 2018
3				136.98									
		Borehole continued on RECORD OF DRILLHOLE FMS-HG18-08A		3.05									
4													
5													
6													
7													
8													
9													
10													

DEPTH SCALE

1 : 50

GOLDER

LOGGED: CM/KL

CHECKED: SB

MIS-BHS 014 1895674.GPJ GAL-MIS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-08A

SHEET 2 OF 3

LOCATION: N 537612.69; E 4997771.114

DRILLING DATE: July 30-31, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRE-NGTH INDEX	WEATH-ERING INDEX	FEATURES	PIEZOMETER
		BEDROCK SURFACE		136.98															
	Rotary Drill HQ3 Core	Slightly weathered to fresh, medium bedded, grey, medium with fine grains, faintly to slightly porous, medium strong, interbedded GREYWACKE-ARGILLITE		3.05	1						JN,PL,RO SA,FeOx BD,UN,SM SO,FeOx	1.5 2	2 1	20 20		R3	W2		
		- Broken core from 3.66 m to 3.78 m																	
4					2						BD,UN,SM CT,Gv 1 mm BD,UN,SM IN,Cl 4 mm BD,UN,SM SO,FeOx	2 2 2	3 8 1	20 6 20		R3	W2		
		- 4.35 m bedding with clay and aperture, lost drill flush circulation									JN,UN,RO SA,FeOx	3	2	22					
5					3						JN,UN,RO SO,FeOx BD,UN,RO SO,FeOx CO,UN,SM CT,Gv 1 mm BD,UN,SM CT,Cl 1 mm	3 3 2 2	1 1 3 4	25 25 20 16		R3	W2		
		- Broken core from 5.79 m to 5.97 m																	
6		- Broken core from 6.15 m to 6.40 m																	Bentonite Seal
					4						JN,ST,SM SA,FeOx JN,UN,SM SA,FeOx JN,UN,RO CT,Ca 1 mm	2 2 3	2 2 3	20 20 22		R3	W2		
7																			
8				132.03															
		Fresh, medium to thinly bedded, grey-green, fine with medium grains, faintly porous, medium strong, interbedded ARGILLITE-GREYWACKE		8.00	5						JN,ST,RO SO,Py JN,UN,RO CT,Ca 1 mm	3 3	1 3	25 22		R3	W1		
		- Broken core from 8.37 m to 8.45 m																	9.37 mbgs
9																			Silica Sand
10					6						JN,UN,SM SA,FeOx BD,UN,SM SA,FeOx	2 2	2 2	20 20		R3	W1		10.29 mbgs
											JN,PL,RO SO,FeOx	1.5	1	20					
11					7						VN,UN,RO SO,FeOx BD,PL,SM SA,FeOx BD,PL,SM SO,FeOx BD,UN,SM SA,FeOx	3 1 1 2	1 2 1 2	25 16 16 20		R3	W1		50 mm Diam. PVC #10 Slot Screen
12											BD,UN,SM SO,FeOx	2	1	20					
		CONTINUED NEXT PAGE																	

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-08A

SHEET 3 OF 3

LOCATION: N 537612.69; E 4997771.114

DRILLING DATE: July 30-31, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRE-NGTH INDEX	WEATH-ERING INDEX	FEATURES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																	
13	Rotary Drill HQ3 Core	Fresh, medium to thinly bedded, grey-green, fine with medium grains, faintly porous, medium strong, interbedded ARGILLITE-GREYWACKE			7						VN,CU,RO SA,Ca	3	2	22		R3	W1		50 mm Diam. PVC #10 Slot Screen
					8						BD,UN,SM SA,FeOx	2	2	20		R3	W1		13.34 mbgs
				126.10							JN,UN,SM -	2	1	20					Silica Sand
14		End of Drillhole		13.93															
		NOTES:																	
		1. Packer testing (falling head test, constant rate injection) performed from 4.16 m to 13.93 m and 7.39 m to 13.93 m depth.																	
		2. Single well response testing (rising head test) performed from 10.29 m to 13.34 m depth.																	
15																			
16																			
17																			
18																			
19																			
20																			
21																			

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-08B

SHEET 1 OF 1

LOCATION: N 537611.398; E 4997771.205

DRILLING DATE: August 1, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		GROUND SURFACE		139.98															
0	Rotary Drill / HW Casing	Overburden drilled out. For soil stratigraphy refer to Record of Borehole FMS-HG18-08A		0.00															Bentonite Seal 0.91 mbgs Silica Sand 1.39 mbgs 2.17 mbgs Aug. 15, 2018
1																			
2																			
3				136.78															
3	Rotary Drill / HQ3 Core	Moderately weathered, medium bedded, grey, medium with fine grains, slightly to moderately porous, medium strong to weak, interbedded GREYWACKE-ARGILLITE		3.20	1						BD,CU,SM CT,FeOx 1 mm JN,UN,SM SA,FeOx JN,UN,SM SO,FeOx	2 2 2	3 2 1	20 20 20		R3	W3		
4		- Broken core from 3.90 m to 4.55 m			2						JN,PL,SM SO,FeOx JN,PL,SM SA,FeOx JN,UN,RO SA,FeOx	1 1 3	1 2 2	16 16 22		R2	W3		50 mm Diam. PVC #10 Slot Screen
5		- Clay seam from 5.63 m to 5.76 m - Broken core from 5.76 m to 6.09 m			3											R2	W3		5.96 mbgs Silica Sand
6				133.53							JN,PL,SM CT,FeOx 1 mm	1	3	16					
		End of Drillhole		6.45															
7		NOTE: 1. Single well response testing (rising head test) performed from 1.39 m to 5.96 m depth.																	
8																			
9																			

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF BOREHOLE: FMS-HG18-09A

SHEET 1 OF 3

LOCATION: N 538367.381 ;E 4999479.784

BORING DATE: June 5-6, 2018

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	REC. LENGTH (mm) / SA. LENGTH (mm)	BLOWS/0.15m	N VALUE	REMARKS, ADDITIONAL LAB. TESTING & GRAIN SIZE DISTRIBUTION (%)	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		123.58						GR SA SI CL	
0	Rotary Drill / HWT Casing	TOPSOIL - (PT) Fibrous PEAT; dark brown; non-cohesive, moist, very loose		0.00 / 0.05	1A			2			
		(GM) sandy SILTY GRAVEL; brown, contains cobbles and/or boulders (GLACIAL TILL); non-cohesive, moist, loose to very dense			1B	SS	305 / 610	3 4 10	7		
					2	SS	51 / 51	50/0.05	>50		
1											
2					3	SS	254 / 457	6 28 50/0.15	>78	35 34 28 3	2.16 mbgs Aug. 15, 2018
3					4	SS	229 / 457	40 50 50/0.15	>100		Bentonite Seal
4		- OS5 sampled from 4.01 m to 4.62 m depth			5	SS	432 / 610	28 40 37 38	77	42 28 28 2	
				118.79							
5		Borehole continued on RECORD OF DRILLHOLE FMS-HG18-09A NOTE: 1. "OS" denotes oversized split spoon sample (0.08 m outer diameter)		4.79							
6											
7											
8											
9											
10											

STANDARD PENETRATION RESISTANCE, N VALUE: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ● ; rem V. ⊕ U - ○ ; 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6} 10^{-5} 10^{-4} 10^{-3}

WATER CONTENT PERCENT: Wp — W — Wl ; 20 40 60 80

DEPTH SCALE

1 : 50

GOLDER

LOGGED: CM/KL

CHECKED: SB

MIS-BHS 014 1895674.GPJ GAL-MIS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-09A

SHEET 3 OF 3

LOCATION: N 538367.381; E 4999479.784

DRILLING DATE: June 5-6, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		BEDROCK SURFACE		118.79															
5	Rotary Drill HQ3 Core	Slightly weathered to fresh, thinly to medium bedded, light grey, medium grained, faintly porous, strong to very strong GREYWACKE - Broken core from 4.88 m to 4.93 m		4.79	1											R4	W2		
					2						JN,PL,RO SA,FeOx	1.5	2	20		R5	W2		Bentonite Seal
6											BD,PL,SM -	1	1	16					
											JN,PL,RO SO,Py	1.5	1	20					6.40 mbgs
7					3						JN,PL,RO CT,Chl 1 mm	1.5	4	16		R5	W1		
																			Silica Sand
8											JN,PL,RO SA,Ca	1.5	2	20		R4	W1		
					4						CO,UN,SM SO,Py	2	1	20					
											JN,UN,SM SA,Py	2	2	20					
											CO,UN,RO -	3	1	25					
9																R5	W1		8.98 mbgs
											VN,UN,SM CT,Chl 1 mm	2	4	16					
10				113.44	5						HCO,PL,- -	4	0.75	25		R3	W1		
		Fresh, thinly bedded, dark grey, fine grained, faintly porous, medium strong mudstone ARGILLITE		10.14							JN,PL,RO -	1.5	1	20					
											BD,UN,SM SO,Py	2	1	20					50 mm Diam. PVC #10 Slot Screen
											BD,UN,SM SO,Py	2	1	20					
11											JN,UN,SM SO,Py	2	1	20					
											BD,PL,SM -	1	1	16					
					6						BD,UN,SM CT,Cl 1 mm	2	4	16		R3	W1		
											BD,PL,SM -	1	1	16					
											BD,UN,SM -	2	1	20					
12				111.20															12.03 mbgs Silica Sand
		End of Drillhole		12.38															
13		NOTES: 1. Packer testing (falling head test, constant rate injection) performed from 6.1 m to 12.38 m depth. 2. Single well response testing (rising head test) performed from 8.98 m to 12.03 m depth.																	

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-09B

SHEET 1 OF 1

LOCATION: N 538367.24; E 4999477.376

DRILLING DATE: June 7, 2018

DATUM: CGVD28

DRILL RIG: CME 75

INCLINATION: -90° AZIMUTH: ---

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		GROUND SURFACE		123.62															
0	Rotary Drill / HWT Casing	Overburden drilled out. For soil stratigraphy refer to Record of Borehole FMS-HG18-09A		0.00															Bentonite Seal 1.59 mbgs Aug. 15, 2018 2.44 mbgs Silica Sand 3.14 mbgs 50 mm Diam. PVC #10 Slot Screen
1																			
2																			
3																			
4																			
5				117.81															
6	RD / HQ3	Slightly weathered, medium bedded, grey, medium grained, faintly porous, strong GREYWACKE		5.81 117.30	1						JN,PL,RO SO,Py	1.5	1	20		R4	W2		6.10 mbgs Silica Sand
		End of Drillhole NOTE: 1. Single well response testing (rising head test) performed from 3.14 m to 6.19 m depth.		6.32															
7																			
8																			
9																			

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF BOREHOLE: FMS-HG18-10A

SHEET 1 OF 3

LOCATION: N 539251.877 ;E 4998600.504

BORING DATE: August 4, 2018

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	REC. LENGTH (mm) / SA. LENGTH (mm)	BLOWS/0.15m	N VALUE	STANDARD PENETRATION RESISTANCE, N VALUE (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q -, U -)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl)	REMARKS, ADDITIONAL LAB. TESTING & GRAIN SIZE DISTRIBUTION (%)	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		140.31								GR SA SI CL	
0	Rotary Drill, HW Casing	POSSIBLE FILL - (SM/GM) SILTY SAND and GRAVEL; grey brown; non-cohesive, dry, compact		0.00	1	SS	330 / 610	5, 13, 12, 17	25	25			
				139.70									
1		(GM) sandy SILTY GRAVEL; grey (GLACIAL TILL); non-cohesive, dry, very dense		0.61	2	SS	559 / 610	16, 30, 50, 40	80	80		52 33 13 2	Bentonite Seal
				138.86									
2		(GW-GM) GRAVEL, some sand, some fines; grey green (RESIDUAL SOIL); non-cohesive, moist, very dense		1.45	3	SS	330 / 584	26, 32, 20, 50/0.13	52	52			1.60 mbgs Aug. 15, 2018
				137.96									
		Borehole continued on RECORD OF DRILLHOLE FMS-HG18-10A		2.35									
3													
4													
5													
6													
7													
8													
9													
10													

DEPTH SCALE

1 : 50

GOLDER

LOGGED: CM/AKV

CHECKED: SB

MIS-BHS 014 1895674.GPJ GAL-MIS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-10A

SHEET 2 OF 3

LOCATION: N 539251.877; E 4998600.504

DRILLING DATE: August 4, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		BEDROCK SURFACE	137.96															
		Slightly weathered, medium bedded, grey, medium with fines grains, slightly porous, medium strong, interbedded GREYWACKE-ARGILLITE - Broken core from 2.72 m to 2.78 m	2.35							BD,IR,SM -	2	1	20					
				1						JN,UN,SM CT,FeOx 1 mm	2	3	20		R3	W2		
										JN,UN,SM CT,FeOx 1 mm	2	3	20					
3										JN,UN,SM CT,FeOx 1 mm	2	3	20					
										JN,CU,RO CT,FeOx 1 mm	3	3	22					
										JN,UN,SM SA,FeOx	2	2	20					
				2						JN,UN,SM SA,FeOx	2	2	20		R3	W2		
										JN,UN,SM SA,FeOx	2	2	20					
		- Broken core from 3.80 m to 3.84 m																
4										JN,UN,SM CT,M 1 mm	2	4	16					
				3						JN,UN,SM SA,FeOx	2	2	20		R3	W2		
5										JN,UN,SM SO,FeOx	2	1	20					
										JN,UN,RO IN,Cl 4 mm	3	8	6					Bentonite Seal
				4											R3	W2		
										JN,UN,RO CT,FeOx 1 mm	3	3	22					
6		- Clay seam from 6.05 m to 6.08 m																
	Rotary Drill																	
7	HQ3 Core			5						JN,UN,SM CT,M 1 mm	2	4	16		R3	W2		
										VN,UN,RO CT,Py 1 mm	3	3	22					
										JN,UN,SM CT,FeOx 1 mm	2	3	20					
										JN,UN,SM CT,FeOx 1 mm	2	3	20					
										JN,UN,SM CT,FeOx 1 mm	2	3	20					
										JN,UN,SM CT,FeOx 1 mm	2	3	20					
8																W2		
			132.12							JN,IR,SM SO,FeOx	2	1	20					
		Fresh, medium bedded, grey, medium with fine grains, slightly porous, medium strong, interbedded GREYWACKE-ARGILLITE	8.19															8.38 mbgs
				6						JN,PL,RO CT,Ca 1 mm	1.5	3	20		R3			
		Drill flush return reduced from full to partial around contact								JN,ST,SM CT,Py 1 mm	2	3	20			W1		Silica Sand
9										JN,CU,SM SA,Cl	2	2	20					9.22 mbgs
										JN,UN,RO -	3	1	25					
										JN,UN,SM -	2	1	20					
10				7						JN,UN,RO -	3	1	25		R3	W1		
										JN,IR,RO -	3	1	25					50 mm Diam. PVC #10 Slot Screen
										BD,UN,SM SA,Cl	2	2	20					
										JN,PL,RO SO,Py	1.5	1	20					
11				8						JN,PL,SM -	1	1	16		R3	W1		
		CONTINUED NEXT PAGE																

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/AKV
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-10A

SHEET 3 OF 3

LOCATION: N 539251.877; E 4998600.504

DRILLING DATE: August 4, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRE-NGTH INDEX	WEATH-ERING INDEX	FEATURES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																	
12	Rotary Drill / HQ3 Core	Fresh, medium bedded, grey, medium with fine grains, slightly porous, medium strong, interbedded GREYWACKE-ARGILLITE Drill flush return reduced from full to partial around contact		128.01	8						JN,ST,SM CT,Chl 1 mm JN,CU,RO CT,Ca 1 mm	2 3	4 3	16 22		R3	W1		50 mm Diam. PVC #10 Slot Screen 12.27 mbgs
		End of Drillhole		12.30															
13		NOTES: 1. Packer testing (falling head test, constant rate injection) performed from 5.02 m to 12.3 m and 7.94 m to 12.3 m depth. 2. Single well response testing (rising head test) performed from 9.22 m to 12.27 m depth.																	
14																			
15																			
16																			
17																			
18																			
19																			
20																			

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/AKV
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-10B

SHEET 1 OF 1

LOCATION: N 539248.832; E 4998600.75

DRILLING DATE: August 6, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
0		GROUND SURFACE		140.19															
0	Rotary Drill / HW Casing	Overburden drilled out. For soil stratigraphy refer to Record of Borehole FMS-HG18-10A		0.00															Bentonite Seal 1.29 mbgs 1.34 mbgs Aug. 15, 2018 Silica Sand 1.90 mbgs
2				138.09															
2	Rotary Drill / HQ3 Core	Slightly weathered to fresh, medium bedded, grey, medium to fine grained, moderately porous, medium strong, interbedded GREYWACKE-ARGILLITE - Broken core from 2.10 m to 2.36 m - Broken core from 2.41 m to 2.88 m		2.10	1											R3	W2		
3											JN,UN,RO CT,FeOx	3	3	22					
3					2						JN,UN,RO SO,FeOx	3	1	25		R3	W2		
3											JN,UN,RO CT,FeOx	3	3	22					
3		- Lost core from 3.57 m to 3.75 m									JN,UN,RO CT,FeOx	3	3	22					
4											JN,UN,SM SO,FeOx	2	1	20					
4		- Broken core from 4.04 m to 4.16 m			3						JN,UN,RO -	3	1	25		R3	W2		50mm Diam. PVC #10 Slot Screen
4											JN,UN,SM CT,Ca	2	3	20					
4											VN,PL,SM - 15 mm	1	1	16					
5											VN,PL,SM CT,FeOx 1 mm	1	3	16					
5											JN,UN,RO -	3	1	25					
5					4						JN,PL,RO SA,FeOx	1.5	2	20		R3	W2		
6											JN,PL,SM IN,Cl 4 mm	1	8	6					
6				133.63	5						JN,IR,RO -	3	1	25		R3	W1		6.47 mbgs
7		End of Drillhole NOTE: 1. Single well response testing (rising head test) performed from 1.9 m to 6.47 m depth.		6.56															

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: AKV/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF BOREHOLE: FMS-HG18-11A

SHEET 1 OF 3

LOCATION: N 538575.327 ;E 4997758.942

BORING DATE: August 2, 2018

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	REC. LENGTH (mm) / SA. LENGTH (mm)	BLOWS/0.15m	N VALUE	STANDARD PENETRATION RESISTANCE, N VALUE (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q -, U -)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl)	REMARKS, ADDITIONAL LAB. TESTING & GRAIN SIZE DISTRIBUTION (%)	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		162.38								GR SA SI CL	
0	Rotary Drill, HW Casing	FILL - (SM) SILTY SAND, some gravel, some peat; brown; non-cohesive, dry, loose		0.00	1A	SS	457 / 610	3, 4, 4	8	8 ■			Bentonite Seal
		(SM) gravelly SILTY SAND; grey brown, contains cobbles and/or boulders (GLACIAL TILL); non-cohesive, dry, compact to very dense		161.90	1B			4					
1				0.48	2	SS	279 / 356	10, 25, 50/0.05	>75	>75 ■			
		Borehole continued on RECORD OF DRILLHOLE FMS-HG18-11A		161.30 1.08									
2													
3													
4													
5													
6													
7													
8													
9													
10													

DEPTH SCALE

1 : 50

GOLDER

LOGGED: CM/KL

CHECKED: SB

MIS-BHS 014 1895674.GPJ GAL-MIS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-11A

SHEET 2 OF 3

LOCATION: N 538575.327; E 4997758.942

DRILLING DATE: August 2, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		BEDROCK SURFACE		161.30															
	Rotary Drill HQ3 Core	Slightly weathered, medium bedded, grey, medium grained, slightly to faintly porous, medium to very strong GREYWACKE, with vuggy quartz, iron stained pyrite veinlets and some silicified beds		1.08	1						BD,PL,SM - JN,UN,RO SA,FeOx	1 3	1 2	16 22		R3	W2		
											JN,UN,SM CT,FeOx 1 mm JN,UN,SM CT,M 1 mm JN,UN,SM CT,M 1 mm JN,PL,RO SA,FeOx	2 2 2 1.5	3 4 4 2	20 16 16 20					
2					2						JN,UN,RO SO,FeOx BD,UN,RO SA,FeOx	3 3	1 2	25 22		R3	W2		
											JN,UN,RO SO,FeOx	3	1	25					
											JN,PL,RO CT,FeOx 1 mm	1.5	3	20					
3											JN,PL,RO SA,FeOx	1.5	2	20					
											BD,UN,RO SO,FeOx	3	1	25					
					3						BD,UN,RO SO,FeOx BD,UN,RO SO,FeOx BD,PL,RO CT,FeOx 1 mm BD,PL,RO SA,FeOx JN,UN,RO SA,FeOx JN,UN,RO CT,Gv 1 mm CO,CU,RO CT,FeOx 1 mm JN,UN,RO SO,FeOx JN,UN,RO SO,FeOx	3 3 1.5 1.5 3 3 3 3 3	1 1 3 2 2 3 3 1 1	25 25 20 20 22 22 22 25 25		R3	W2		3.90 mbgs Aug. 15, 2018 Bentonite Seal
4																			
5					4						JN,PL,RO SO,FeOx JN,PL,RO SO,FeOx	1.5 1.5	1 1	20 20		R5	W2		
6											CO,UN,SM SA,FeOx CO,UN,RO SA,FeOx	2 3	2 2	20 22					
											JN,PL,RO SA,FeOx	1.5	2	20					
7					5						BD,UN,SM SO,FeOx	2	1	20		R4	W2		
											BD,UN,RO SO,FeOx	3	1	25					7.29 mbgs Silica Sand 7.87 mbgs
8																			
					6											R4	W2		50 mm Diam. PVC #10 Slot Screen
9																			
											BD,PL,RO SA,FeOx JN,PL,RO SA,FeOx JN,UN,RO SO,FeOx VN,PL,RO SA,FeOx	1.5 1.5 3 1.5	2 2 1 2	20 20 25 20					
					7						JN,UN,RO SA,FeOx	3	2	22		R4	W2		
10																			
		CONTINUED NEXT PAGE																	

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-11A

SHEET 3 OF 3

LOCATION: N 538575.327; E 4997758.942

DRILLING DATE: August 2, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRE-NGTH INDEX	WEATH-ERING INDEX	FEATURES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																	
	Rotary Drill / HQ3 Core	Slightly weathered, medium bedded, grey, medium grained, slightly to faintly porous, medium to very strong GREYWACKE, with vuggy quartz, iron stained pyrite veinlets and some silicified beds		151.46	7											R4	W2		50 mm Diam. PVC #10 Slot Screen 10.92 mbgs
11		End of Drillhole		10.92															
		NOTES: 1. Packer testing (falling head test, constant rate injection) performed from 3.16 m to 10.92 m depth. 2. Single well response testing (rising head test) performed from 7.87 m to 10.92 m depth.																	
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-11B

SHEET 1 OF 1

LOCATION: N 538573.361; E 4997760.251

DRILLING DATE: August 3, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
0		GROUND SURFACE		162.41															
0	Rotary Drill / HW Casing	Overburden drilled out. For soil stratigraphy refer to Record of Borehole FMS-HG18-11A		0.00															Bentonite Seal
1				161.14															
1	Rotary Drill / HQ3 Core	Slightly weathered, medium bedded, grey, medium grained, faintly porous, strong to very strong GREYWACKE		1.27	1						JN,PL,RO SA,Ca	1.5	2	20		R4	W2		1.37 mbgs Silica Sand 1.85 mbgs
2					2						JN,PL,RO SA,FeOx JN,UN,RO SO,FeOx	1.5 3	2 1	20 25		R5	W2		50mm Diam. PVC #10 Slot Screen
3											JN,PL,RO SO,FeOx	1.5	1	20					
3											BD,UN,RO SA,FeOx	3	2	22					3.33 mbgs Aug. 15, 2018
4											JN,PL,RO SO,FeOx	1.5	1	20					
4					3						JN,PL,RO SO,FeOx	1.5	1	20		R5	W2		
4											BD,UN,SM SA,FeOx BD,PL,RO SO,FeOx BD,UN,RO SO,FeOx	2 1.5 3	2 1 1	20 20 25					
5				157.47															4.90 mbgs
5		End of Drillhole NOTE: 1. Single well response testing (rising head test) performed from 1.85 m to 4.9 m depth.		4.94															

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF BOREHOLE: FMS-HG18-13A

SHEET 1 OF 3

LOCATION: N 539918.735 ;E 4997839.078

BORING DATE: August 7, 2018

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	REC. LENGTH (mm) / SA. LENGTH (mm)	BLOWS/0.15m	N VALUE	STANDARD PENETRATION RESISTANCE, N VALUE (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl; 20 40 60 80)	REMARKS, ADDITIONAL LAB. TESTING & GRAIN SIZE DISTRIBUTION (%)	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		151.29								GR SA SI CL	
0	Rotary Drill / HW Casing	(SM) gravelly SILTY SAND; brown, contains argillite/greywacke fragments (GLACIAL TILL); non-cohesive, dry, dense to very dense		0.00	1	SS	230 / 610	4 19 24 35	43	43			
1					2	SS	230 / 230	60 50/0.08	>50	>50			
		- OS3 sampled from 1.22 m to 1.60 m depth			3	SS	330 / 380	47 77 50/0.08	>127	>127		35 37 25 3	Bentonite Seal
				149.40	4	SS	0 / 76	50/0.05	>50	>50			
2		Weathered BEDROCK (Drilled out) - Washed out during setting of casing and drilling of initial run in bedrock		1.89									
				148.59									
3		Borehole continued on RECORD OF DRILLHOLE FMS-HG18-13A		2.70									
		NOTE: 1. "OS" denotes oversized split spoon sample (0.08 m outer diameter)											
4													
5													
6													
7													
8													
9													
10													

DEPTH SCALE

1 : 50

GOLDER

LOGGED: AKV/KL

CHECKED: SB

MIS-BHS 014 1895674.GPJ GAL-MIS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-13A

SHEET 2 OF 3

LOCATION: N 539918.735; E 4997839.078

DRILLING DATE: August 7, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		BEDROCK SURFACE		148.59															
		Slightly weathered to fresh, medium bedded, grey, medium to fine grained, slightly to faintly porous, medium strong ARGILLITE-GREYWACKE		2.70	1						JN,PL,RO -	1.5	1	20		R3	W2		
3		- Broken core from 2.7 m to 2.80 m - Broken core from 2.93 m to 3.13 m - Broken core from 3.24 m to 3.39 m - Lost core from 3.39 m to 3.65 m - Broken core from 3.65 m to 3.91 m																	3.67 mbgs Aug. 15, 2018
4					2						JN,UN,SM CT,FeOx 1 mm	2	3	20		R3	W2		
		- Broken core from 4.69 m to 4.75 m									JN,PL,SM CT,FeOx 1 mm	1	3	16					
5		- Lost core from 4.89 m to 4.96 m - Broken core from 5.08 m to 5.31 m - Clay seam from 5.31 m to 5.57 m			3						JN,PL,SM CT,FeOx 1 mm	1	3	16		R3	W3		Bentonite Seal
6											JN,IR,RO SA,FeOx JN,UN,RO SA,FeOx	3 3	2 2	22 22					
											JN,UN,SM CT,Cl 1 mm	2	4	16					
		- Broken core from 6.33 m to 6.52 m			4						JN,UN,SM -	2	1	20		R3	W2		
7	Rotary Drill NQ3 Core										JN,PL,SM -	1	1	16					
											JN,PL,SM -	1	1	16					
					5						JN,PL,SM SO,FeOx	1	1	16		R3	W2		
											VN,UN,RO CT,FeOx 1 mm JN,UN,SM CT,FeOx 1 mm	3 2	3 3	22 20					
8																			
					6						JN,UN,SM -	2	1	20		R3	W1		
											JN,IR,RO -	3	1	25					8.84 mbgs
9																			Silica Sand
											JN,IR,RO -	3	1	25					9.38 mbgs
											JN,UN,SM -	2	1	20					
10					7						JN,CU,SM - JN,UN,SM CT,Cl 1 mm	2 2	1 4	20 16		R3	W1		
		- Broken core from 10.04 m to 10.07 m																	50 mm Diam. PVC #10 Slot Screen
11					8											R3	W1		
		CONTINUED NEXT PAGE																	

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: AKV/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-13A

SHEET 3 OF 3

LOCATION: N 539918.735; E 4997839.078

DRILLING DATE: August 7, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRE-NGTH INDEX	WEATH-ERING INDEX	FEATURES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																	
12	Rotary Drill / NQ3 Core			138.86	8											R3	W1		50 mm Diam. PVC #10 Slot Screen 12.38 mbgs
		End of Drillhole		12.43															
13		NOTES: 1. Packer testing (falling head test, constant rate injection) performed from 8.09 m to 12.43 m depth. 2. Single well response testing (rising head test) performed from 9.38 m to 12.43 m depth.																	
14																			
15																			
16																			
17																			
18																			
19																			
20																			

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: AKV/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-13B

SHEET 1 OF 1

LOCATION: N 539918.735; E 4997839.078

DRILLING DATE: August 8-9, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
0		GROUND SURFACE		151.33															
	Rotary Drill / HW Casing	Overburden drilled out. For soil stratigraphy refer to Record of Borehole FMS-HG18-13A		0.00															Bentonite Seal 1.80 mbgs 1.79 mbgs Aug. 15, 2018 Silica Sand 2.52 mbgs
				148.74															
	Rotary Drill / HQ3 Core	Slightly weathered, medium bedded, greenish grey, medium to fine grained, slightly to faintly porous, medium strong ARGILLITE-GREYWACKE - Broken core from 2.59 m to 3.08 m - Lost core from 3.08 m to 3.46 m - Broken core from 3.46 m to 3.51 m - Broken core from 3.51 m to 3.67 m		2.59	1												R3	W2		
					2											R3	W2		
					3						JN,PL,SM SO,FeOx	1	1	16		R3	W2		50 mm Diam. PVC #10 Slot Screen
											JN,CU,SM CT,Cl 1 mm	2	4	16					
					4						JN,PL,SM IN,Cl 2 mm JN,UN,SM IN,Bx 5 mm	1 2	8 5	6 6		R3	W2		
				145.71															5.57 mbgs
		End of Drillhole NOTE: 1. Single well response testing (rising head test) performed from 2.52 m to 5.57 m depth.		5.62															

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: AKV/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF BOREHOLE: FMS-HG18-14A

SHEET 1 OF 3

LOCATION: N 536802.336 ;E 4998352.852

BORING DATE: June 8, 2018

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	REC. LENGTH (mm) / SA. LENGTH (mm)	BLOWS/0.15m	N VALUE	STANDARD PENETRATION RESISTANCE, N VALUE / SHEAR STRENGTH Cu, kPa	HYDRAULIC CONDUCTIVITY, k, cm/s / WATER CONTENT PERCENT	REMARKS, ADDITIONAL LAB. TESTING & GRAIN SIZE DISTRIBUTION (%)	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		116.89								GR SA SI CL	
0	Rotary Drill / HTW Casing	FILL - (GM/SM) SILTY GRAVEL and SAND; brown, contains cobbles and/or boulders; non-cohesive, dry, dense to very dense		0.00	1	SS	406 / 610	4 9 24 25	33	33			
1					2	SS	381 / 457	30 30 50/0.15	>80	>80		41 41 11 7	
				115.37	3-1	SS	0 / 25	50/0.03	>50	>50			
		(SM) gravelly SILTY SAND; brown grey, contains cobbles and/or boulders (GLACIAL TILL); non-cohesive, wet, very dense		1.52	3	SS	305 / 457	18 41 50/0.15	>91	>91		34 47 13 6	
2					4	SS	229 / 457	29 34 50/0.15	>84	>84			
				114.15									
		Borehole continued on RECORD OF DRILLHOLE FMS-HG18-14A		2.74									
3													
4													Bentonite Seal
5													
6													
7													
8													
9													
10													

STANDARD PENETRATION RESISTANCE, N VALUE: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ● / rem V. ⊕ U - ○; 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6} 10^{-5} 10^{-4} 10^{-3}

WATER CONTENT PERCENT: Wp ⊢ ○ W ⊣ WI; 20 40 60 80

DEPTH SCALE

1 : 50

GOLDER

LOGGED: CM/CDM

CHECKED: SB

MIS-BHS 014 1895674.GPJ GAL-MIS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-14A

SHEET 2 OF 3

LOCATION: N 536802.336; E 4998352.852

DRILLING DATE: June 8, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRE-NGTH INDEX	WEATH-ERING INDEX	FEATURES	PIEZOMETER
		BEDROCK SURFACE	114.15															
3	Rotary Drill HQ3 Core	Slightly weathered, thinly bedded, fine grained, dark grey, Slightly to moderately porous, medium to very strong mudstone ARGILLITE	2.74	1						BD,UN,SM SA,FeOx	2	2	20		R3	W2		
				2											R3	W2		
		Drill flush return partial from weathered top of rock								JN,UN,RO SO,FeOx	3	1	25					
		- Broken core from 2.74 m to 2.84 m								JN,PL,RO SA,FeOx	1.5	2	20					
4				3						BD,PL,SM SA,FeOx	1	2	16		R3	W2		
		- Lost drill flush circulation								SH,UN,RO CT,M 1 mm	3	4	20					
										HVN,PL,RO -	4	0.75	25					
										JN,UN,RO SO,FeOx	3	1	25					
5										JN,UN,RO CT,FeOx 1 mm	3	3	22					4.75 mbgs Aug. 15, 2018
										JN,UN,RO SA,FeOx	3	2	22					
										JN,UN,SM SA,FeOx	2	2	20					
				4						JN,UN,RO SO,FeOx	3	1	25		R4	W2		
																		Bentonite Seal
6										JN,UN,RO SA,FeOx	3	2	22					
										JN,PL,RO SA,FeOx	1.5	2	20					
										JN,UN,RO -	3	1	25					
										JN,UN,SM SA,FeOx	2	2	20					
										JN,UN,SM -	2	1	20					
7										JN,UN,SM CT,M 1 mm	2	4	16					
				5						JN,PL,RO SA,FeOx	1.5	2	20		R5	W2		
										JN,UN,SM CT,Bx 1 mm	2	3	20					
			108.89							JN,PL,RO SA,FeOx	1.5	2	20					
8		Slightly weathered, medium bedded, grey, medium grained, faintly porous, medium to strong, interbedded GREYWACKE-ARGILLITE, with rip-up structure along bedding contacts	8.00							JN,UN,RO SO,FeOx	3	1	25					
										JN,PL,RO SA,FeOx	1.5	2	20					
				6											R4	W2		
										CO,UN,RO SO,FeOx	3	1	25					8.84 mbgs
9										JN,UN,SM SO,FeOx	2	1	20					Silica Sand
										JN,PL,RO -	1.5	1	20					9.55 mbgs
										JN,UN,RO CT,Bx 1 mm	3	3	22					
10				7											R3	W2		
										BD,UN,RO SO,FeOx	3	1	25					50 mm Diam. PVC #10 Slot Screen
11			105.89							JN,UN,SM SO,FeOx	2	1	20					
		Slightly weathered, medium bedded, light grey, medium grained, faintly porous, medium to strong GREYWACKE	11.00	8						JN,PL,RO SA,Ca	1.5	2	20		R3	W2		
		CONTINUED NEXT PAGE																

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/CDM
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-14A

SHEET 3 OF 3

LOCATION: N 536802.336; E 4998352.852

DRILLING DATE: June 8, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRE-NGTH INDEX	WEATH-ERING INDEX	FEATURES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																	
12	Rotary Drill HQ3 Core	Slightly weathered, medium bedded, light grey, medium grained, faintly porous, medium to strong GREYWACKE			8											R3	W2		50 mm Diam. PVC #10 Slot Screen
											JN,UN,RO CT,FeOx 1 mm	3	3	22					
13					9											R4	W2		12.60 mbgs
											BD,UN,RO -	3	1	25					Silica Sand
				103.08															
14		End of Drillhole		13.81															
		NOTES:																	
		1. Packer testing (falling head test, constant rate injection) performed from 4.1 m to 13.81 m, 6.04 m to 13.81 m and 11.52 m to 13.81 m depth.																	
15		2. Single well response testing (rising head test) performed from 9.55 m to 12.6 m depth.																	
16																			
17																			
18																			
19																			
20																			

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/CDM
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-14B

SHEET 1 OF 1

LOCATION: N 536804.298; E 4998352.727

DRILLING DATE: June 10, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
0		GROUND SURFACE		116.97															
0	Rotary Drill / HTW Casing	Overburden drilled out. For soil stratigraphy refer to Record of Borehole FMS-HG18-14A		0.00															Bentonite Seal 1.22 mbgs Silica Sand 1.86 mbgs
1																			
2				114.47															
3	Rotary Drill / HQ3 Core	Slightly weathered, medium bedded, grey, medium and fine grained, moderately to slightly porous, medium to very strong, interbedded GREYWACKE-ARGILLITE Partial Flush return from top of rock, lost at 3.08 m		2.50	1						BD,UN,RO SA,FeOx	3	2	22		R3	W2		
											SH,UN,SM IN,Cl 4 mm	2	8	6					
											BD,UN,SM SA,FeOx	2	2	20					
											BD,PL,RO -	1.5	1	20					
					2						BD,UN,SM CT,Bx 1 mm	2	3	20		R3	W2		
					3						BD,UN,SM SA,FeOx	2	2	20		R3	W2		
4											BD,UN,RO SA,FeOx	3	2	22					
					4											R4	W2		50 mm Diam. PVC #10 Slot Screen
		- Void from 4.54 m to 4.56 m									SH,UN,RO CT,Cl 1 mm	3	4	20					4.71 mbgs Aug. 15, 2018
5											JN,PL,SM SA,FeOx	1	2	16					
					5						JN,CU,RO SO,FeOx	3	1	25		R4	W2		
6											JN,IR,RO SO,FeOx	3	1	25					6.43 mbgs
					6						JN,PL,RO SO,FeOx	1.5	1	20		R5	W2		Silica Sand
		- Broken core from 7.18 m to 7.24 m									BD,UN,SM SA,FeOx	2	2	20					
				109.14															
8		End of Drillhole NOTE: 1. Single well response testing (rising head test) performed from 1.86 m to 6.43 m depth.		7.83															
9																			

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/CDM
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF BOREHOLE: FMS-HG18-15A

SHEET 1 OF 3

LOCATION: N 536367.439 ;E 4998746.870

BORING DATE: June 11, 2018

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	REC. LENGTH (mm) / SA. LENGTH (mm)	BLOWS/0.15m	N VALUE	STANDARD PENETRATION RESISTANCE, N VALUE (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q -, U -)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl)	REMARKS, ADDITIONAL LAB. TESTING & GRAIN SIZE DISTRIBUTION (%)	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		107.46								GR SA SI CL	
0	Rotary Drill / HTW Casing	TOPSOIL - (PT) Fibrous PEAT; dark brown; non-cohesive, dry, very loose		0.00									
		(GM) sandy SILTY GRAVEL; brown, contains cobbles and/or boulders (GLACIAL TILL); non-cohesive, dry to wet, loose to very dense		0.10	1	SS	305/610	1 1 6	7	7 ■			
					2-1	SS	0/50	23 50/0.05	>50	>50 ■			
1					2	SS	127/229	12 50/0.08	>50	>50 ■			0.66 mbgs Aug. 15, 2018
				106.03									
		(ML/GM) sandy SILT and GRAVEL; brown, contains cobbles and/or boulders (GLACIAL TILL); non-cohesive, wet, dense to very dense		1.43	3	SS	102/152	50/0.15	>50	>50 ■			
2					4	SS	127/254	35 50/0.10	>50	>50 ■			
				105.11									
		Borehole continued on RECORD OF DRILLHOLE FMS-HG18-15A		2.35									Bentonite Seal
3													
4													
5													
6													
7													
8													
9													
10													

DEPTH SCALE

1 : 50

GOLDER

LOGGED: CM/CDM

CHECKED: SB

MIS-BHS 014 1895674.GPJ GAL-MIS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-15A

SHEET 2 OF 3

LOCATION: N 536367.439; E 4998746.87

DRILLING DATE: June 11, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		BEDROCK SURFACE		105.11															
3	Rotary Drill HQ3 Core	Slightly weathered to fresh, medium bedded, grey, fine to medium grained, moderately to faintly porous, medium strong, interbedded ARGILLITE-GREYWACKE - Broken core from 3.02 m to 3.14 m		2.35	1						BD,PL,RO SA,FeOx BD,UN,SM SA,FeOx BD,UN,SM CT,FeOx 1 mm BD,UN,SM CT,FeOx 1 mm BD,UN,SM SA,FeOx BD,UN,SM CT,M 1 mm BD,UN,SM CT,Cl 1 mm	1.5 2 2 2 2 1.5 1.5	2 2 3 2 4 3 1	20 20 20 20 16 20 20		R3	W2		
					2						JN,PL,RO CT,FeOx 1 mm BD,PL,RO SO,FeOx BD,UN,SM SO,Py	2	1	20		R3	W2		
4					3						BD,UN,SM SA,FeOx CO,PL,SM CT,M 1 mm BD,PL,SM CT,Bx 1 mm BD,PL,SM CT,M 1 mm BD,PL,SM - SH,PL,RO IN,Cl 4 mm BD,PL,SM CT,Cl 1 mm BD,PL,SM -	2 1 1 1 1 1.5 1	2 4 3 4 1 6 4 1	20 12 16 12 16 6 12 16		R3	W2		Bentonite Seal
5					4						BD,UN,SM - BD,PL,RO - CO,UN,SM -	2 1.5 2	1 1 1	20 20 20		R3	W1		5.49 mbgs
6					5						CO,UN,SM - CO,PL,SM SO,Py BD,UN,SM SA,Chl BD,PL,RO - BD,PL,RO CT,Py 1 mm	2 1 2 1.5 1.5	1 1 2 1 3	20 16 20 20 20		R3	W1		Silica Sand 7.73 mbgs
8					6						CO,UN,SM SA,Py BD,PL,SM -	2 1	2 1	20 16		R3	W1		
9					7						CO,UN,SM - JN,UN,SM CT,Ca 1 mm BD,UN,SM CT,Ca 1 mm VN,UN,SM -	2 2 2 2	1 3 3 1	20 20 20 20		R3	W1		50 mm Diam. PVC #10 Slot Screen 10.78 mbgs
11		End of Drillhole		96.58 10.88															
		NOTES:																	
		CONTINUED NEXT PAGE																	

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/CDM
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-15A

SHEET 3 OF 3

LOCATION: N 536367.439; E 4998746.87

DRILLING DATE: June 11, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-6} 10^{-5} 10^{-4} 10^{-3})	ROCK STRE-NGTH INDEX	WEATH-ERING INDEX	FEATURES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																	
12		1. Packer testing (falling head test, constant rate injection) performed from 5.12 m to 10.83 m depth. 2. Single well response testing (rising head test) performed from 7.73 m to 10.78 m depth.																	
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/CDM
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-15B

SHEET 1 OF 1

LOCATION: N 536367.09; E 4998743.627

DRILLING DATE: June 13, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		GROUND SURFACE		107.56															
0	Rotary Drill / HTW Casing	Overburden drilled out. For soil stratigraphy refer to Record of Borehole FMS-HG18-15A		0.00															Bentonite Seal 0.76 mbgs 0.92 mbgs Aug. 15, 2018
1																			
2				105.55															
2	Rotary Drill / HQ3 Casing	Slightly weathered, medium bedded, light and dark grey, medium and fine grained, slightly to faintly porous, medium strong, interbedded GREYWACKE-ARGILLITE, with rip-up structures on contact beddings		2.01							BD,PL,SM CT,M 1 mm	1	4	12					
											JN,CU,RO CT,FeOx 1 mm	3	3	22					
3					1						CO,PL,SM CT,Cl 1 mm	1	4	12		R3	W2		50 mm Diam. PVC #10 Slot Screen
											BD,PL,SM SA,Cl	1	2	16					
											BD,PL,RO SO,FeOx	1.5	1	20					
					2						CO,UN,RO CT,Cl 1 mm	3	4	20		R3	W2		
4				103.39							CO,UN,SM SA,FeOx	2	2	20					4.07 mbgs
		End of Drillhole NOTE: 1. Single well response testing (rising head test) performed from 1.03 m to 4.08 m depth.		4.17															
5																			
6																			
7																			
8																			
9																			

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: CM/CDM
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF BOREHOLE: FMS-HG18-16A

SHEET 1 OF 3

LOCATION: N 540442.988 ;E 4999567.685

BORING DATE: August 9-10, 2018

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	REC. LENGTH (mm) / SA. LENGTH (mm)	BLOWS/0.15m	N VALUE	STANDARD PENETRATION RESISTANCE, N VALUE (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q -, U -)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl)	REMARKS, ADDITIONAL LAB. TESTING & GRAIN SIZE DISTRIBUTION (%)	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		142.17								GR SA SI CL	
0	Rotary Drill / HW Casing	(SM) gravelly SILTY SAND; reddish brown (GLACIAL TILL); non-cohesive, dry, loose to compact		0.00	1	SS	400 / 610	4 5 4 4	9	9		26 44 22 8	
1					2	SS	180 / 610	3 4 8 7	12	12		38 36 19 7	Bentonite Seal
				140.65									
		(GM/SM) SILTY GRAVEL and SAND; brown (GLACIAL TILL); non-cohesive, moist, dense to very dense		1.52	3	SS	340 / 340	68 50/0.05	>50	>50			
2				140.11	4	SS	0 / 51	50/0.05	>50	>50			
		Borehole continued on RECORD OF DRILLHOLE FMS-HG18-16A		2.06									
3													
4													
5													
6													
7													
8													
9													
10													

DEPTH SCALE

1 : 50

GOLDER

LOGGED: AKV/KL

CHECKED: SB

MIS-BHS 014 1895674.GPJ GAL-MIS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-16A

SHEET 2 OF 3

LOCATION: N 540442.988; E 4999567.685

DRILLING DATE: August 9-10, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		BEDROCK SURFACE	140.11															
		Slightly weathered to fresh, medium bedded, grey, medium to fine grained, slightly to faintly porous, medium strong GREYWACKE-ARGILLITE	2.06															
		- Broken core from 2.06 m to 2.18 m - Broken core from 2.52 m to 2.53 m		1						JN,PL,SM IN,Cl 5 mm JN,PL,SM SA,FeOx JN,CU,RO CT,FeOx 1 mm	1 1 3	15 2 3	0 16 22		R3	W2		
3		- Lost core from 2.99 m to 3.08 m								JN,UN,SM CT,FeOx 1 mm	2	3	20					2.79 mbgs Aug. 15, 2018
		- Broken core from 3.23 m to 3.25 m - Broken core from 3.36 m to 3.36 m		2											R3	W2		
		- Lost core from 3.64 m to 4 m																
4		- Broken core from 4 m to 4.1 m																
		- Broken core from 4.5 m to 4.75 m		3						JN,PL,SM CT,Cl 1 mm JN,UN,SM SO,FeOx JN,PL,RO SO,FeOx JN,UN,RO IN,Cl 5 mm	1 2 1.5 3	4 1 1 15	12 20 20 0		R3	W2		Bentonite Seal
5										JN,UN,RO - JN,PL,RO -	3 1.5	1 1	25 20					
										JN,UN,SM CT,Cl 1 mm JN,PL,SM -	2 1	4 1	16 16					
				4						JN,PL,SM - JN,PL,SM IN,Cl 6 mm JN,PL,SM -	1 1 1	1 15 1	16 0 16		R3	W2		
		- Broken core from 5.64 m to 5.88 m - Lost core from 5.88 m to 5.95 m																
6										JN,IR,RO CT,FeOx JN,UN,SM - JN,PL,SM -	3 2 1	3 1 1	22 20 16					
										JN,PL,RO CT,FeOx 1 mm	1.5	3	20					
7										JN,UN,RO CT,FeOx 1 mm	3	3	22					
				5						JN,PL,SM IN,FeOx 2 mm JN,PL,SM -	1 1	4 1	6 16		R3	W2		7.25 mbgs
										JN,PL,SM CT,FeOx 1 mm	1	3	16					Silica Sand 7.86 mbgs
8										JN,PL,SM CT,FeOx 1 mm JN,PL,SM CT,FeOx 1 mm JN,PL,SM - JN,PL,SM - JN,PL,SM - JN,UN,RO CT,FeOx 1 mm JN,UN,SM CT,FeOx	1 1 1 1 3 2	3 3 1 1 3 3	16 16 16 16 22 20					
				6											R3	W1		
9										JN,UN,SM CT,FeOx 1 mm	2	3	20					
										JN,PL,RO - JN,PL,SM -	1.5 1	1 1	20 16					50 mm Diam. PVC #10 Slot Screen
										JN,UN,SM SO,Cl	2	1	20					
										JN,PL,SM SO,Py	1	1	16					
10										JN,CU,RO -	3	1	25					
				7						JN,PL,SM -	1	1	16		R3	W1		
										JN,PL,SM -	1	1	16					
11			131.15							JN,PL,SM -	1	1	16					10.91 mbgs
		CONTINUED NEXT PAGE																

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: AKV/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-16A

SHEET 3 OF 3

LOCATION: N 540442.988; E 4999567.685

DRILLING DATE: August 9-10, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-6} 10^{-5} 10^{-4} 10^{-3})	ROCK STRE-NGTH INDEX	WEATH-ERING INDEX	FEATURES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																	
12		End of Drillhole NOTES: 1. Packer testing (falling head test, constant rate injection) performed from 7.48 m to 11.02 m depth. 2. Single well response testing (rising head test) performed from 7.86 m to 10.91 m depth.		11.02							JN,PL,RO -								
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			

FEATURES LEGEND

BROKEN CORE FAULT LOST CORE CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: AKV/KL
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

PROJECT: 1895674

RECORD OF DRILLHOLE: FMS-HG18-16B

SHEET 1 OF 1

LOCATION: N 540445.433; E 4999567.498

DRILLING DATE: August 11, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: Logan Drilling

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	ROCK STRENGTH INDEX	WEATHERING INDEX	FEATURES	PIEZOMETER
		GROUND SURFACE		142.19															
0	Rotary Drill / HW Casing	Overburden drilled out. For soil stratigraphy refer to Record of Borehole FMS-HG18-16A		0.00															Bentonite Seal
1																			
2																			1.83 mbgs Silica Sand 2.42 mbgs
3				139.13															
	Rotary Drill / HQ3 Core	Slightly weathered, medium bedded, grey, fine to medium grained, moderately porous, medium strong ARGILLITE-GREYWACKE - Broken core from 3.06 m to 3.3 m - Broken core from 3.33 m to 3.42 m - Broken core from 3.59 m to 3.64 m - Lost core from 3.64 m to 3.78 m		3.06	1											R3	W2		3.39 mbgs Aug. 15, 2018
4		- Clay seam from 4.19 m to 4.28 m			2						JN,UN,SM SO,FeOx JN,UN,SM CT,Cl 1 mm JN,UN,SM CT,Cl 1 mm JN,PL,SM CT,Cl 1 mm JN,UN,SM CT,FeOx 0.5 mm JN,PL,SM - JN,IR,SM CT,Cl 1 mm JN,UN,SM SA,Cl	2 2 1 2 1 2 2	1 4 4 3 1 4 2	20 16 12 20 16 16 20		R3	W2		50 mm Diam. PVC #10 Slot Screen
5		- Broken core from 5.44 m to 5.47 m		136.54	3						JN,ST,SM CT,Cl 0.5 mm JN,PL,SM CT,M 1 mm JN,UN,SM CT,M 1 mm JN,UN,SM SA,FeOx JN,UN,SM SA,Cl	2 1 2 2 2	4 4 2 2 2	16 12 16 20 20		R3	W2		5.47 mbgs Cave
		End of Drillhole NOTE: 1. Single well response testing (rising head test) performed from 2.42 m to 5.47 m depth.		5.65															
6																			
7																			
8																			
9																			

FEATURES LEGEND

BROKEN CORE | FAULT | LOST CORE | CLAY SEAM

HYDRAULIC CONDUCTIVITY LEGEND

PACKER TESTING | SINGLE WELL RESPONSE TESTING

DEPTH SCALE
1 : 50

GOLDER

LOGGED: AKV/MA
CHECKED: CM

MIS-RCK 022 1895674.GPJ GAL-MISS.GDT 4/29/19 ZS

APPENDIX B

Photography of Soil Split Spoons and Rock Cores

Appendix B1 – Soil Split Spoon Photos

1895674 – FIFTEEN MILE STREAM

2019-09-10

FMS-HG18-02X

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-02X
Date (yy/mm/dd): 18/08/06
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: SS1
SPT Blow Counts: 1 | 5 | 8 | 12
Client: Atlantic Gold Corporation
Depth (m): 0.00 to 0.61
SPT N-Value: 13
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-02X

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-02X
Date (yy/mm/dd): 18/08/06
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: SS2
SPT Blow Counts: 50 | 50/1" |
Client: Atlantic Gold Corporation
Depth (m): 0.61 to 0.79
SPT N-Value: —
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-03A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-03A
Date (yy/mm/dd): 2018-08-12
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 1
SPT Blow Counts: 4 12 35 26 4
Client: Atlantic Gold Corporation
Depth (m): 0.0 to 0.61
SPT N-Value: 80
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-03A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-03A
Date (yy/mm/dd): 2018-08-12
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 2
SPT Blow Counts: 50/2
Client: Atlantic Gold Corporation
Depth (m): 0.61 to 0.66
SPT N-Value: 50/2"
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-03A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-03A
Date (yy/mm/dd): 2018-08-12
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 3
SPT Blow Counts: 9 31 50/1
Client: Atlantic Gold Corporation
Depth (m): 0.94 to 1.24
SPT N-Value: 155/6"
0 10 20 30 40 50 60
Scale in cm
Richard

FMS-HG18-03A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-03A
Date (yy/mm/dd): 2018-08-12
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 4
SPT Blow Counts: 55/3"
Client: Atlantic Gold Corporation
Depth (m): 1.64 to 1.71
SPT N-Value: 55/3"
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-03A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-03A
Date (yy/mm/dd): 2018-08-12
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 5
SPT Blow Counts: 28 | 57/2" |
Client: Atlantic Gold Corporation
Depth (m): 2.35 to 2.55
SPT N-Value: 57/2"
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-03A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-03A
Date (yy/mm/dd): 2018-08-12
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 6
SPT Blow Counts: 16 14 28 40
Client: Atlantic Gold Corporation
Depth (m): 3.05 to 3.66
SPT N-Value: 42
0 10 20 30 40 50 60
Scale in cm
FIELD BOREHOLE LOG

FMS-HG18-03A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-03A
Date (yy/mm/dd): 2018-08-12
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 7
SPT Blow Counts: 60 | 44 | 72/4"
Client: Atlantic Gold Corporation
Depth (m): 3.78 to 4.19
SPT N-Value: 116/10"
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-03A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-03A
Date (yy/mm/dd): 2018-08-12
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 8
SPT Blow Counts: 70 57/1"
Client: Atlantic Gold Corporation
Depth (m): 6.14 to 6.32
SPT N-Value: 57/1"
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-04A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-04A
Date (yy/mm/dd): 18/06/13
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: SS1
SPT Blow Counts: 6 | 3 | 2 | 10
Client: Atlantic Gold Corporation
Depth (m): 0.00 to 0.61
SPT N-Value: 5
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-04A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-04A
Date (yy/mm/dd): 18/06/13
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: SS 2
SPT Blow Counts: 17 | 50/3 |
Client: Atlantic Gold Corporation
Depth (m): 0.91 to 1.04
SPT N-Value: –
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-04A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-04A
Date (yy/mm/dd): 18/06/13
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: SS3
SPT Blow Counts: 12 | 16 | 23 | 24
Client: Atlantic Gold Corporation
Depth (m): 1.81 to 2.41
SPT N-Value: 38
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-04A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-04A
Date (yy/mm/dd): 18/06/13
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: SS4
SPT Blow Counts: 12 | 12 | 13 | 27
Client: Atlantic Gold Corporation
Depth (m): 2.62 to 3.23
SPT N-Value: 25
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-04A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-04A
Date (yy/mm/dd): 18/06/13
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: SS5
SPT Blow Counts: 12 | 19 | 24 | 22
Client: Atlantic Gold Corporation
Depth (m): 3.38 to 3.99
SPT N-Value: 43
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-04A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-04A
Date (yy/mm/dd): 18/06/13
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 6
SPT Blow Counts: 17 12 01 17 21
Client: Atlantic Gold Corporation
Depth (m): 4.12 to 4.73
SPT N-Value: 37
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-04A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-04A
Date (yy/mm/dd): 18/06/14
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: SS7
SPT Blow Counts: 18 | 50/3 | 1
Client: Atlantic Gold Corporation
Depth (m): 4.88 to 5.11
SPT N-Value: —
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-05A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-05A
Date (yy/mm/dd): 18/05/29
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 1
SPT Blow Counts: 1 1 3 1 7 1 21
Client: Atlantic Gold Corporation
Depth (m): 0.00 to 0.61
SPT N-Value: 10
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-05A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-05A
Date (yy/mm/dd): 18/05/29
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 2
SPT Blow Counts: 21 | 50 / | /
Client: Atlantic Gold Corporation
Depth (m): 0.61 to 0.89
SPT N-Value:
0 10 20 30 40 50 60
Scale in cm

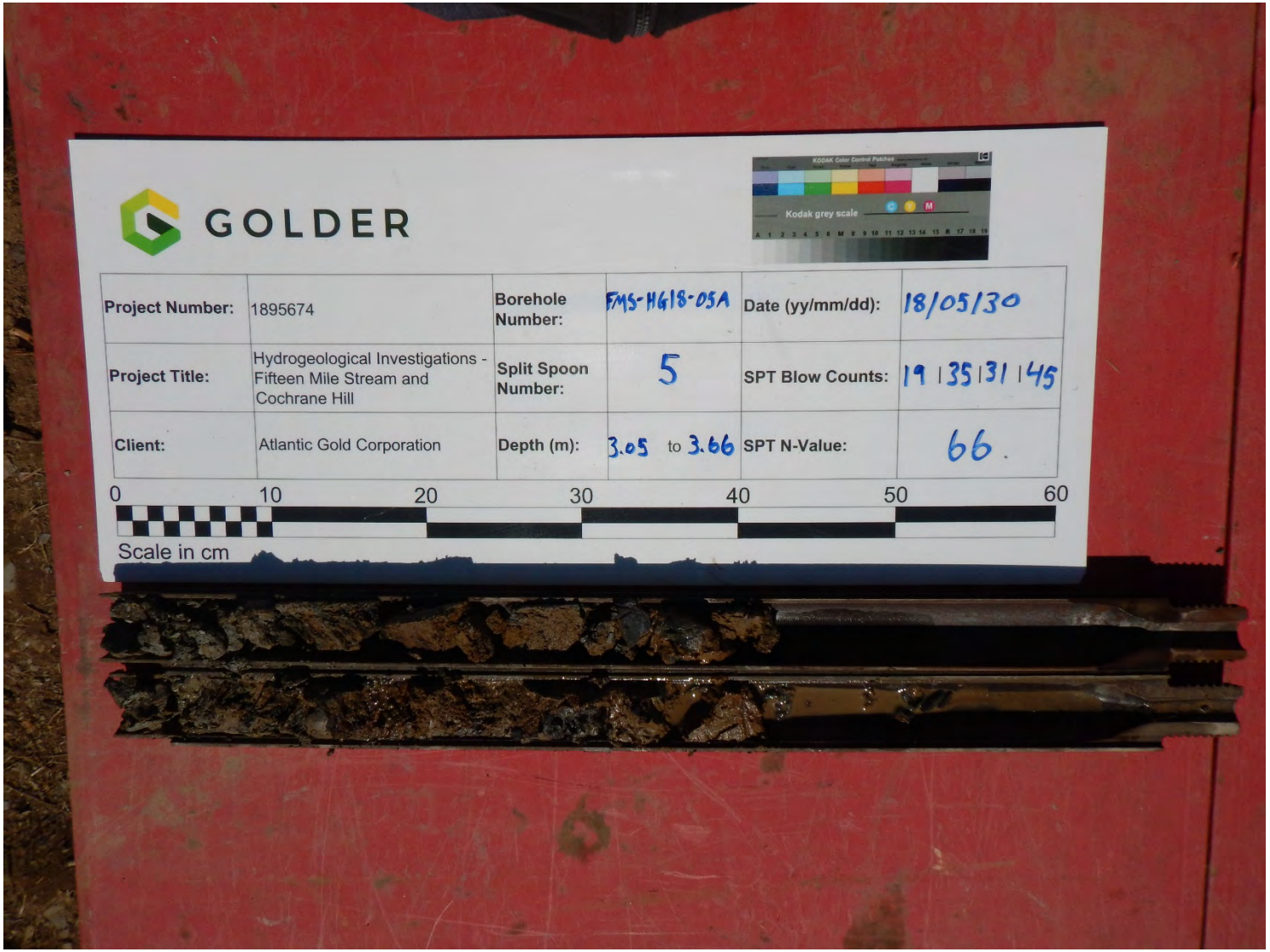
FMS-HG18-05A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-05A
Date (yy/mm/dd): 18/05/29
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 3
SPT Blow Counts: 33|29|38|40
Client: Atlantic Gold Corporation
Depth (m): 1.53 to 2.14
SPT N-Value: 67
0 10 20 30 40 50 60
Scale in cm

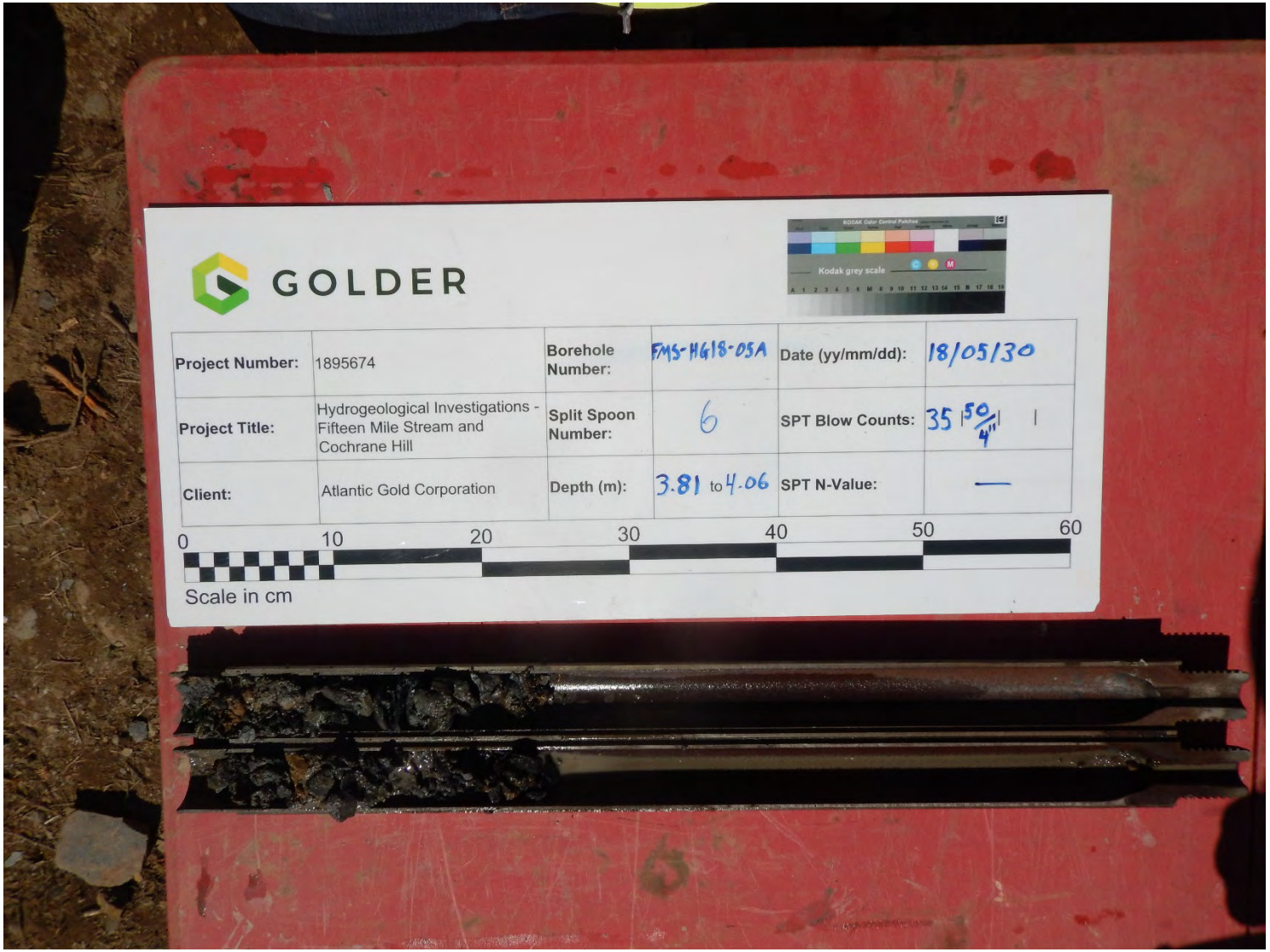
FMS-HG18-05A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-05A
Date (yy/mm/dd): 18/05/30
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 4
SPT Blow Counts: 28 | 28 | 50/3"
Client: Atlantic Gold Corporation
Depth (m): 2.29 to 2.67
SPT N-Value: —
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-05A


GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-05A
Date (yy/mm/dd): 18/05/30
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 5
SPT Blow Counts: 19 | 35 | 31 | 45
Client: Atlantic Gold Corporation
Depth (m): 3.05 to 3.66
SPT N-Value: 66
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-05A


GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-05A
Date (yy/mm/dd): 18/05/30
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 6
SPT Blow Counts: 35 50/4"
Client: Atlantic Gold Corporation
Depth (m): 3.81 to 4.06
SPT N-Value: —
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-06A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-06A
Date (yy/mm/dd): 18/06/02
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 1
SPT Blow Counts: 5 | 5 | 45
Client: Atlantic Gold Corporation
Depth (m): 0 to 0.46
SPT N-Value: —
0 10 20 30 40 50 60
Scale in cm

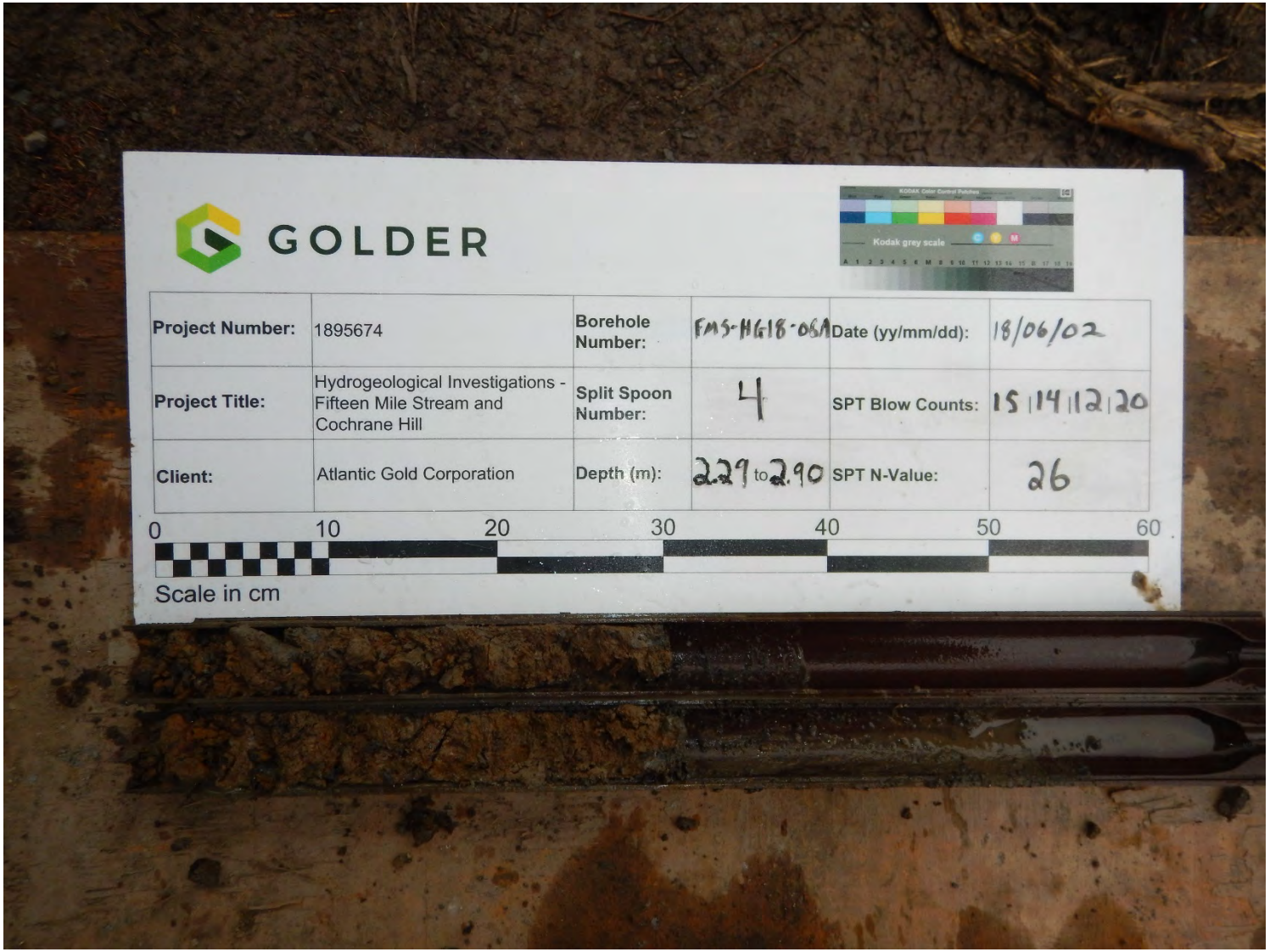
FMS-HG18-06A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-06A
Date (yy/mm/dd): 18/06/02
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 2
SPT Blow Counts: 11 | 5 | 4 | 6
Client: Atlantic Gold Corporation
Depth (m): 0.61 to 1.22
SPT N-Value: 9
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-06A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-06A
Date (yy/mm/dd): 18/06/02
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 3
SPT Blow Counts: 9 | 11 | 11 | 12
Client: Atlantic Gold Corporation
Depth (m): 1.53 to 2.14
SPT N-Value: 22
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-06A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Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-06A
Date (yy/mm/dd): 18/06/02
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 4
SPT Blow Counts: 15 | 14 | 12 | 20
Client: Atlantic Gold Corporation
Depth (m): 2.29 to 2.90
SPT N-Value: 26
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-07A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-07A
Date (yy/mm/dd): 18/06/03
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 1
SPT Blow Counts: 1 | 7 | 6 | 17
Client: Atlantic Gold Corporation
Depth (m): 0.00 to 0.61
SPT N-Value: 13
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-07A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-07A
Date (yy/mm/dd): 18/06/03
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 2
SPT Blow Counts: 11|13|14|12
Client: Atlantic Gold Corporation
Depth (m): 0.61 to 1.22
SPT N-Value: 27
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-07A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-07A
Date (yy/mm/dd): 18/06/03
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 3
SPT Blow Counts: 21 | 24 | 14 | 17
Client: Atlantic Gold Corporation
Depth (m): 1.83 to 2.44
SPT N-Value: 38
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-07A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-07A
Date (yy/mm/dd): 18/06/03
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 4
SPT Blow Counts: 21 | 26 | 18 | 30
Atlantic Gold Corporation
Depth (m): 2.44 to 3.05
SPT N-Value: 44
10
20
30
40
50
60

FMS-HG18-07A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-07A
Date (yy/mm/dd): 18/06/03
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 5
SPT Blow Counts: 50/4"
Client: Atlantic Gold Corporation
Depth (m): 3.20 to 3.30
SPT N-Value: —
0 10 20 30 40 50 60
Scale in cm

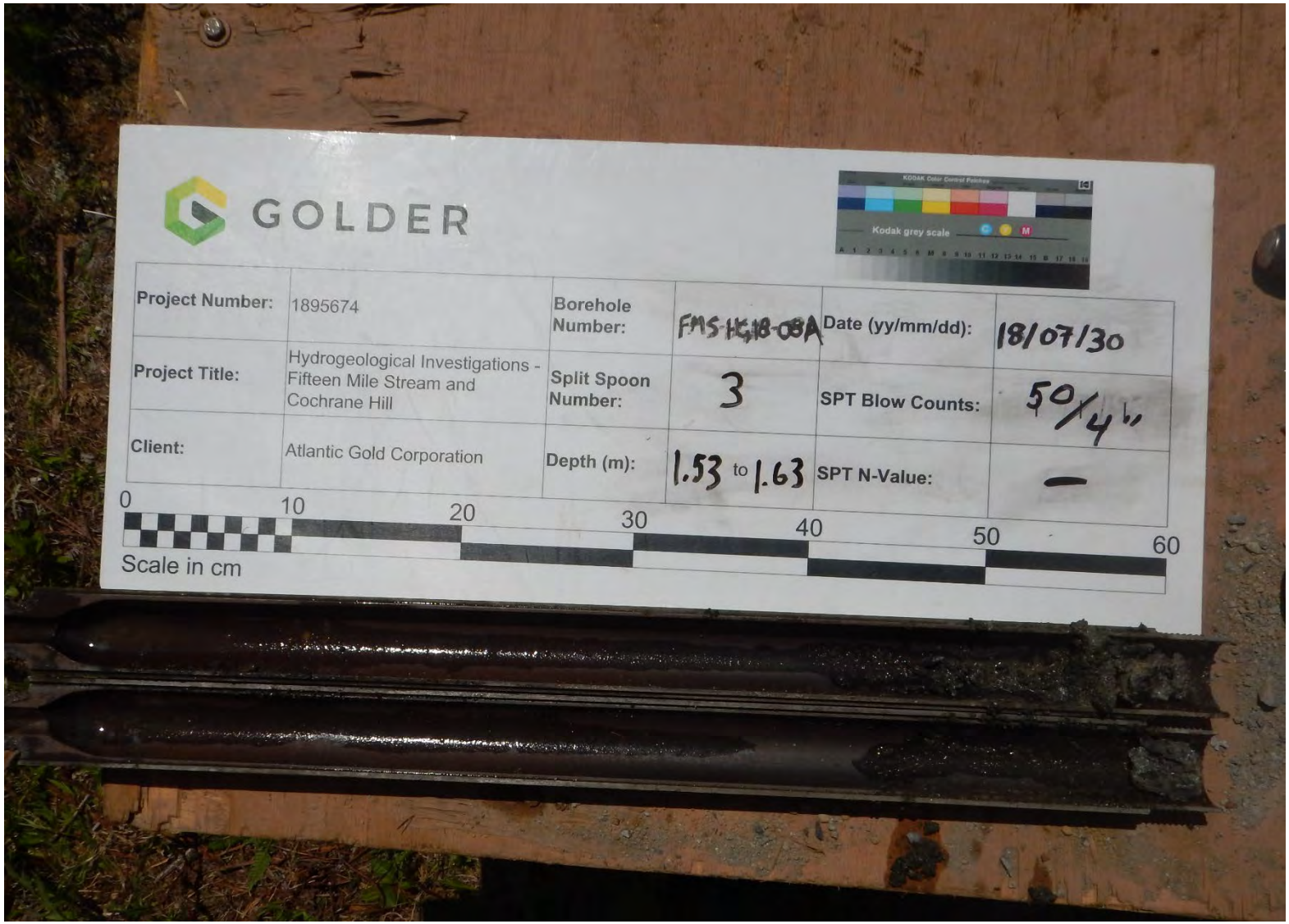
FMS-HG18-08A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-08A
Date (yy/mm/dd): 18/07/30
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 1
SPT Blow Counts: 1 | 7 | 8 | 14
Client: Atlantic Gold Corporation
Depth (m): 0.00 to 0.61
SPT N-Value: 15
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-08A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-08A
Date (yy/mm/dd): 18/07/30
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 2
SPT Blow Counts: 19 27 59
Client: Atlantic Gold Corporation
Depth (m): 0.61 to 0.98
SPT N-Value: –
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-08A


GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-08A
Date (yy/mm/dd): 18/07/30
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 3
SPT Blow Counts: 50/4"
Client: Atlantic Gold Corporation
Depth (m): 1.53 to 1.63
SPT N-Value: –
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-09A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-09A
Date (yy/mm/dd): 18/06/05
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 1
SPT Blow Counts: 2 | 3 | 4 | 10
Client: Atlantic Gold Corporation
Depth (m): 0 to 0.61
SPT N-Value: 7
0 10 20 30 40 50 60
Scale in cm

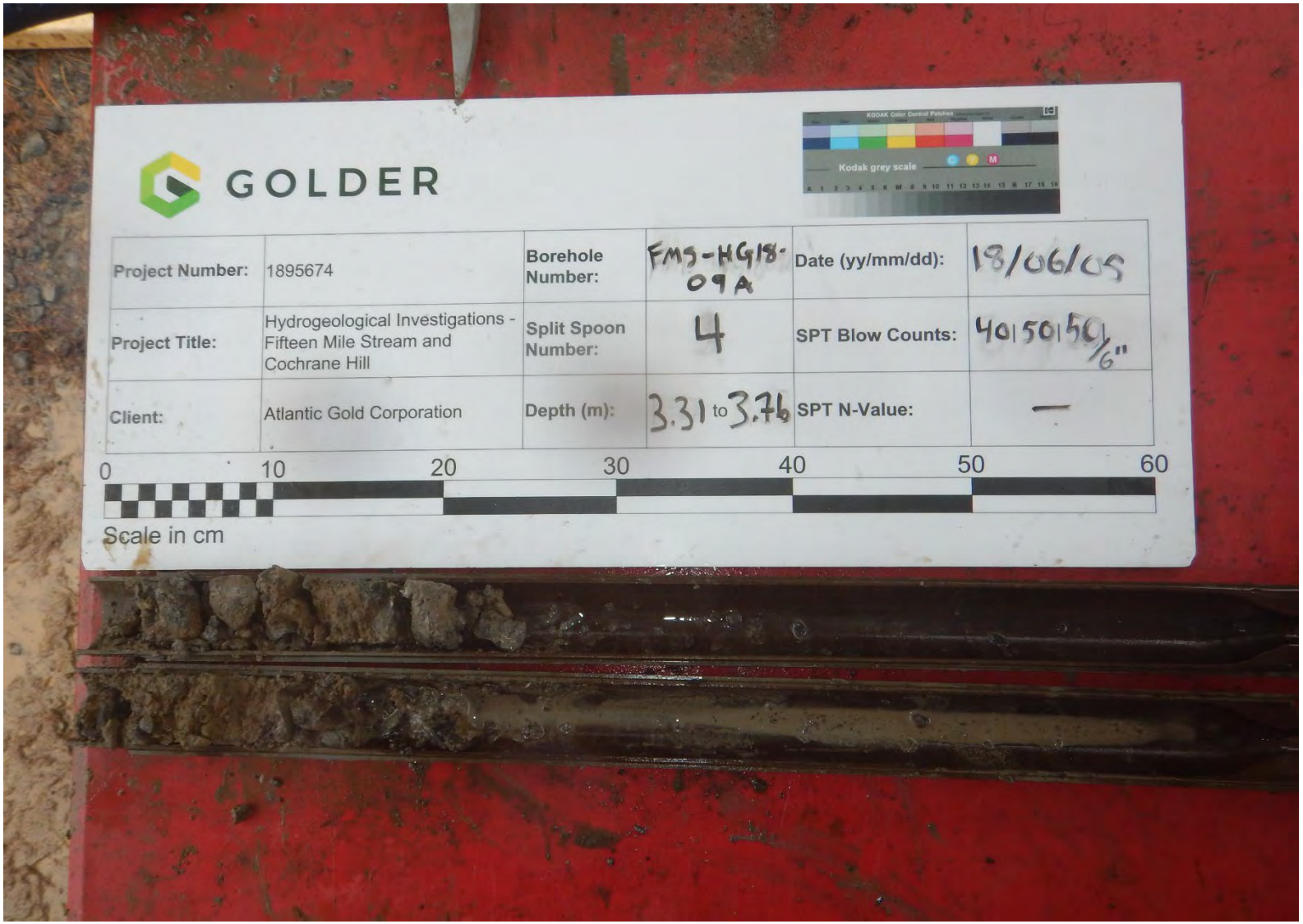
FMS-HG18-09A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-09A
Date (yy/mm/dd): 18/06/05
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 2
SPT Blow Counts: 50/2"
Client: Atlantic Gold Corporation
Depth (m): 0.61 to 0.65
SPT N-Value: ---
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-09A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-09A
Date (yy/mm/dd): 06/05
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 3
SPT Blow Counts: 6 12 8 9 1/6"
Client: Atlantic Gold Corporation
Depth (m): 1.57 to 2.03
SPT N-Value:
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-09A


GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-09A
Date (yy/mm/dd): 18/06/05
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 4
SPT Blow Counts: 40/50/50/6"
Client: Atlantic Gold Corporation
Depth (m): 3.31 to 3.76
SPT N-Value: —
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-09A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-09A
Date (yy/mm/dd): 18/06/06
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 5
SPT Blow Counts: 28 | 40 | 37 | 38
Client: Atlantic Gold Corporation
Depth (m): 4.01 to 4.67
SPT N-Value: 77
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-10A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-10A
Date (yy/mm/dd): 18/08/04
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 1
SPT Blow Counts: 5 | 13 | 12 | 15
Client: Atlantic Gold Corporation
Depth (m): 0 to 2
SPT N-Value: 25
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-10A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-10A
Date (yy/mm/dd): 18/08/04
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 2
SPT Blow Counts: 16 | 30 | 50 | 40
Client: Atlantic Gold Corporation
Depth (m): 0.61 to 1.22
SPT N-Value: 80
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-10A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-10A
Date (yy/mm/dd): 18/08/04
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 3
SPT Blow Counts: 26 | 32 | 20 | 50/5+
Client: Atlantic Gold Corporation
Depth (m): 1.45 to 2.06
SPT N-Value: 52
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-11A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-11A
Date (yy/mm/dd): 18/08/02
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 1
SPT Blow Counts: 3 | 4 | 4 | 4
Client: Atlantic Gold Corporation
Depth (m): 0 to 0.61
SPT N-Value: 8
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-11A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-11A
Date (yy/mm/dd): 18/08/02
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 2
SPT Blow Counts: 10 | 25 | 50/2"
Client: Atlantic Gold Corporation
Depth (m): 0.61 to 0.97
SPT N-Value: –
0
10
20
30
40
50
60

FMS-HG18-13A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-13A
Date (yy/mm/dd): 18/08/07
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 1
SPT Blow Counts: 4 | 9 | 24 | 35
Client: Atlantic Gold Corporation
Depth (m): 0 to 0.61
SPT N-Value: 43
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-13A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-13A
Date (yy/mm/dd): 18/08/07
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 2
SPT Blow Counts: 60 50/3
Client: Atlantic Gold Corporation
Depth (m): 0.61 to 0.84
SPT N-Value:
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-13A

GOLDER
Kodak gray scale
Project Number: 1895674
Borehole Number: FMS-HG18-13A
Date (yy/mm/dd): 18/08/07
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 3
SPT Blow Counts: 47 177 50/3"
Client: Atlantic Gold Corporation
Depth (m): 1.22 to 1.60
SPT N-Value:
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-14A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-14A
Date (yy/mm/dd): 18/06/08
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 1
SPT Blow Counts: 4 | 9 | 24 | 25
Client: Atlantic Gold Corporation
Depth (m): 0 to 0.61
SPT N-Value: 33
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-14A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-14A
Date (yy/mm/dd): 18/06/08
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 2
SPT Blow Counts: 30 | 30 | 50/6
Client: Atlantic Gold Corporation
Depth (m): 0.61 to 1.07
SPT N-Value:
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-14A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-14A
Date (yy/mm/dd): 18/06/08
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: SS3
SPT Blow Counts: 19 | 41 | 50/6
Client: Atlantic Gold Corporation
Depth (m): 1.63 to 2.08
SPT N-Value:
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-14A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-14A
Date (yy/mm/dd): 18/06/09
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: SS4
SPT Blow Counts: 29 | 34 | 50/6"
Client: Atlantic Gold Corporation
Depth (m): 2.29 to 2.74
SPT N-Value:
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-15A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-15A
Date (yy/mm/dd): 18/06/11
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: SS1
SPT Blow Counts: 1 | 1 | 6 | 25
Client: Atlantic Gold Corporation
Depth (m): 0.00 to 0.61
SPT N-Value: 7
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-15A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-15A
Date (yy/mm/dd): 18/06/11
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: SS 2
SPT Blow Counts: 12 | 50/3
Client: Atlantic Gold Corporation
Depth (m): 0.86 to 1.09
SPT N-Value: -
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-15A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-15A
Date (yy/mm/dd): 18/06/11
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: SS3
SPT Blow Counts: 50/6
Client: Atlantic Gold Corporation
Depth (m): 1.43 to 1.58
SPT N-Value: —
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-15A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-15A
Date (yy/mm/dd): 18/06/11
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: SS4
SPT Blow Counts: 37 50/4
Client: Atlantic Gold Corporation
Depth (m): 1.82 to 2.08
SPT N-Value: —
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-16A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-16A
Date (yy/mm/dd): 18/08/09
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 1
SPT Blow Counts: 4 | 5 | 4 | 4
Client: Atlantic Gold Corporation
Depth (m): 0 to 0.61
SPT N-Value: 9
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-16A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-16A
Date (yy/mm/dd): 18/08/09
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 2
SPT Blow Counts: 3 | 4 | 8 | 17
Client: Atlantic Gold Corporation
Depth (m): 0.61 to 1.22
SPT N-Value: 12
0 10 20 30 40 50 60
Scale in cm

FMS-HG18-16A

GOLDER
Kodak grey scale
Project Number: 1895674
Borehole Number: FMS-HG18-16A
Date (yy/mm/dd): 18/08/09
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Split Spoon Number: 3
SPT Blow Counts: 68 50/3
Client: Atlantic Gold Corporation
Depth (m): 1.52 to 1.75
SPT N-Value:
0 10 20 30 40 50 60
Scale in cm

Appendix B2 – Rock Core Box Photos

1895674 – FIFTEEN MILE STREAM

2019-09-10

FMS-HG18-02A

1895674 - FMS & CH Investigations
Borehole Number: FMS-HG-02B
Box Number: 1
Run Number: 1 to 4
Depth: 2.62m to 5.33
GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-02A
Date (yy/mm/dd): 18/08/08
Project Title: Hydrogeological investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1 to 4
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 2.62 to 5.33
Prepared by: CM/MA
Kodak grey scale
Scale in cm

FMS-HG18-02A

1895674 - FMS & CH Investigations
Borehole Number: FMS-HG-02B
Box Number: 1
Run Number: 1 to 4
Depth: 2.62m to 5.33
GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-02A
Date (yy/mm/dd): 18/08/08
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 4 to 6
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 5.33 to 8.17
Prepared by: CM/MA
KODAK Color Control Patches
Kodak grey scale
Scale in cm
6.27
7.77
8.17m

FMS-HG18-02A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-02 A
Date (yy/mm/dd): 18/08/09
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 6 to 9
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 8.17 to 10.85
Prepared by: CM/MA
Kodak grey scale
Scale in cm

FMS-HG18-02A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-02A
Date (yy/mm/dd): 18/08/09
Project Title: Hydrogeological Ifvestigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 9 to 10
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 10.85 to 13.68
Prepared by: CM/MA
KODAK Color Control Patches
Kodak grey scale
Scale in cm

FMS-HG18-02A

Run Number : 9 to 10
Depth: 12.85m to 13.68m
GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-02A
Date (yy/mm/dd): 18/08/09
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 10 to 11
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 13.68 to 16.31
Prepared by: CM/MA
Kodak grey scale
Scale in cm

FMS-HG18-02A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-02A
Date (yy/mm/dd): 18/08/09
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 11 to 13
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 16.32 to 19.19
Prepared by: CM/MA
Kodak grey scale
Scale in cm

FMS-HG18-02A

1895674 - FMS & CH Investigations
Borehole Number: FMS-HG-02B
Box Number: 6
Run Number: 11 to 13
Depth: 16.32m to 19.19m
GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-02A
Date (yy/mm/dd): 18/08/09
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 13 to 15
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 19.19 to 21.87
Prepared by: CM/MA
Kodak grey scale

FMS-HG18-02A

1895674 - FMS & CH Investigat
Borehole Number: FMS-HG-0
Run Number: 13 to 15
Box Number: 7
Depth: 19.19m to 21.87m
GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-02 A
Date (yy/mm/dd): 18/08/09
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 15 to 16
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 21.87 to 24.77
Prepared by: CM/MA
Kodak grey scale
22.77
24.77
EOH

FMS-HG18-2B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-02B
Date (yy/mm/dd): 18/08/10
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1-4
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 3.98 to 6.61
Prepared by: CM/MA
Kodak grey scale
Scale in cm
FMS-HG18-02B
Run#1 - Run#4

FMS-HG18-2B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-02 B#
Date (yy/mm/dd): 18/08/10
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 4-5
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 6.61 to 8.22
Prepared by: CM/MA
KODAK Color Control Patches
Kodak grey scale
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
Scale in cm

FMS-HG18-02X

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-02x
Date (yy/mm/dd): 18/08/06
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1 - 4
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 1.01 to 3.82
Prepared by: CM/MA
Kodak grey scale
Scale in cm
3.67
3.82m

FMS-HG18-02X

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-02X
Date (yy/mm/dd): 19/08/06
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 4 to 6
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 3.82 to 6.52
Prepared by: CM/MA
Kodak grey scale
Scale in cm

FMS-HG18-02X

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-02X
Date (yy/mm/dd): 18/08/07
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 6 to 9
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 6.50 to 9.24
Prepared by: CM/MA
Kodak grey scale
Scale in cm
6.50
6.67
6.95m
9.24m
FMS-HG18-02X

FMS-HG18-02X

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-02X
Date (yy/mm/dd): 18/08/07
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 9 to 11
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 9.24 to 11.85
Prepared by: CM/MA
Kodak grey scale
Scale in cm

FMS-HG18-02X

Run Number: 4 to 6
Depth: 3.32m to 6.5a m
189674-FMS&CH Hydrogeo. Investigations
Bore hole Number: FMS-HG18-02A, Box Number: 4
Run Number: 9. to 11
Depth: 9.24m to 11.85m
189674-FMS&CH Hydrogeo. Investigations
Bore hole Number: FMS-HG18-02A, Box Number: 5
Run Number: 11 to 13
Depth: 11.85m to 14.6
GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-02X
Date (yy/mm/dd): 18/08/08
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 11 to 13
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 11.85-14.65
Prepared by: CM/MA
Kodak grey scale
Scale in cm
3.39
3.79

FMS-HG18-02X

Project Number: 1895674
Borehole Number: FMS-HG18-02X
Date (yy/mm/dd): 18/08/08
Project Title: Hydrogeological Investigations – Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 13 to 14
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 14.69 to 16.73
Prepared by: CM/MA
GOLDER
Kodak grey scale
Scale in cm

FMS-HG18-03A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-03A
Date (yy/mm/dd): 18/08/13
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1 to 2
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 6.32 to 9.06
Prepared by: A.K-Y/M.A.
Kodak grey scale
Scale in cm
6.32m

FMS-HG18-03A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-03A
Date (yy/mm/dd): 18/08/13
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 3-4
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 9.06 to 12.08
Prepared by: A.K.V/M.A.
Kodak grey scale
Scale in cm
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
→12.08m

FMS-HG18-03B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-03B
Date (yy/mm/dd): 18/08/15
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1-2
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 4.80 to 7.05
Prepared by: A.K.V/M.A.
KODAK Color Control Patches
Kodak grey scale
Scale in cm
4.80m
6.29m
7.05m
7.05m
1895674
Hydrogeological Investigations
Box
Core Run
to 12.08m

FMS-HG18-04A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-04A
Date (yy/mm/dd): 18/06/14
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1 to 2
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 5.19 to 7.80
Prepared by: CM/CDM
KODAK Color Control Patches
Kodak grey scale
Scale in cm

FMS-HG18-04A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-04A
Date (yy/mm/dd): 18/06/14
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 3 to 4
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 7.82 to 10.67
Prepared by: CM/KL
Kodak grey scale
Scale in cm

FMS-HG18-04A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-04A
Date (yy/mm/dd): 18/06/14
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 4 to 6
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 10.62 to 13.16
Prepared by: CM/KL
Kodak grey scale
Scale in cm
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

FMS-HG18-04A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-04A
Date (yy/mm/dd): 18/06/14
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 6 to 9
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 13.16 to 15.65
Prepared by: CM/KL
KODAK Color Control Patches
Kodak grey scale
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
Scale in cm

FMS-HG18-04A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-04A
Date (yy/mm/dd): 18/06/14
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 9 to 12
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 156.5 to 183.1
Prepared by: CM/KL
KODAK Color Control Patches
Kodak grey scale
Scale in cm

FMS-HG18-04A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-04A
Date (yy/mm/dd): 18/06/15
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 12-13
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 18.22 to 20.95
Prepared by: CM / KL
Kodak grey scale
Scale in cm

FMS-HG18-04A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-04A
Date (yy/mm/dd): 18/06/15
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 13 to 15
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 20.95 to 22.70
Prepared by: CM / KL
KODAK Color Control Patches
Kodak grey scale
Scale in cm

FMS-HG18-04A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-04A
Date (yy/mm/dd): 18/06/15
Project Title: Hydrogeological investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 15-17
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 22.70 to 25.74
Prepared by: CM / KL
KODAK Color Control Patches
Kodak grey scale
Scale in cm
22.70 m
25.74 m

FMS-HG18-04B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-04B
Date (yy/mm/dd): 18/06/15
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1-3
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 4.54 to 7.45
Prepared by: KL
Kodak grey scale
Scale in cm
4.54m
7.45m

FMS-HG18-04B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-04B
Date (yy/mm/dd): 18/06/15
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 3
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 7.45 to 7.79
Prepared by: KL
KODAK Color Control Patches
Kodak grey scale
Scale in cm
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

FMS-HG18-05A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-05A
Date (yy/mm/dd): 18/05/30
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1 to 4
Core Condition: (Dry/Wet) Dry
Client: Atlantic Gold Corporation
Depth (m): 4.06 to 6.77
Prepared by: CM/KL
Kodak grey scale
Scale in cm
4.52m
4.81m
6.31m
6.77m

FMS-HG18-05A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-05A
Date (yy/mm/dd): 18/05/30
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 4 to 6
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 6.77 to 9.55
Prepared by: CM/KL
KODAK Color Control Patches
Kodak grey scale
Scale in cm
6.77m
9.55m

FMS-HG18-05A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-05A
Date (yy/mm/dd): 18/05/31
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 6 to 7
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 9.55 to 12.31
Prepared by: CM/KL
KODAK Color Control Patches
Kodak grey scale
Scale in cm
9.55m
10.81m
12.31

FMS-HG18-05A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-05A
Date (yy/mm/dd): 18/05/31
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 8
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 12.31 to 13.81
Prepared by: CM/KL
KODAK Color Control Patches
Kodak grey scale
Scale in cm
12.31
13.81

FMS-HG18-05B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-05B
Date (yy/mm/dd): 18/06/01
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1 & 2
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 4.24 to 6.36
Prepared by: CM/KL
Kodak grey scale
Scale in cm
FMS-HG18-05B Box 1
4.24m Top Rock
4.86
6.36m (EOH)

FMS-HG18-06A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-06A
Date (yy/mm/dd): 18/06/03
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1 to 4
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 2.96 to 5.48
Prepared by: CM/KL
Kodak grey scale
Scale in cm
3.41m
4.94m
5.48m

FMS-HG18-06A

GOLDER
Project Number: 1895674.
Borehole Number: FMS-HG18-06A
Date (yy/mm/dd): 18/06/03
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 4 to 5
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 5.48 to 8.36
Prepared by: CM/KL
KODAK Color Control Patches
Kodak grey scale
Scale in cm
6.31m
6.33m
VOID
8.36m

FMS-HG18-07A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-07A
Date (yy/mm/dd): 18/06/03
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1 to 4
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 3.30 to 6.58
Prepared by: CM / KL
Kodak grey scale
Scale in cm
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
3.30m
FMS-HG18-07A Box 1
3.42m
4.56m
4.93m
6.08m

FMS-HG18-07A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-07A
Date (yy/mm/dd): 18/06/04
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 4 to 6
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 6.08 to 8.95
Prepared by: CM / KL
KODAK Color Control Patches
Kodak grey scale
Scale in cm
6.08m
8.95m

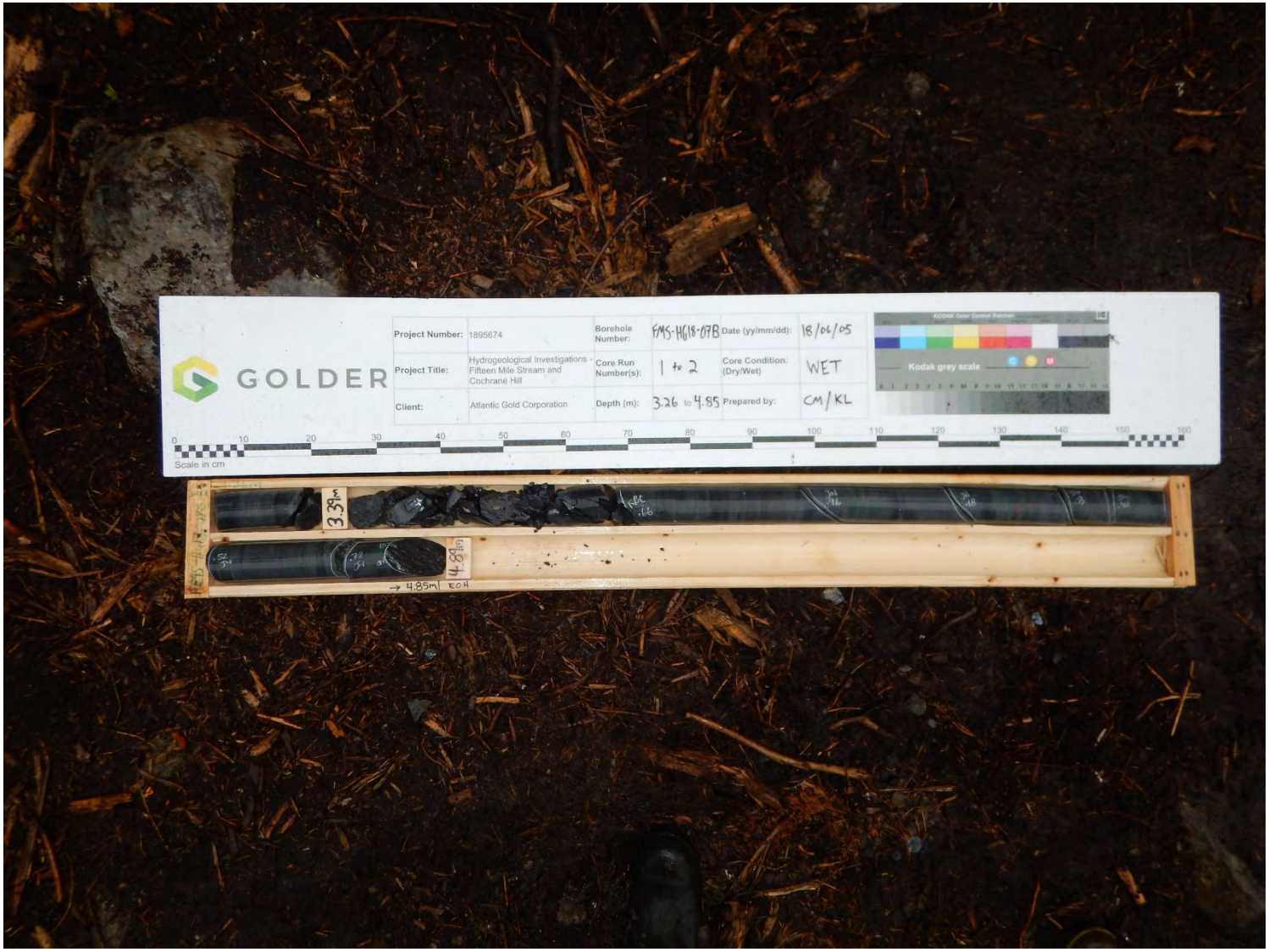
FMS-HG18-07A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-07A
Date (yy/mm/dd): 18/06/04
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 6 to 8
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 8.95 to 11.76
Prepared by: CM / KL
KODAK Color Control Patches
Kodak grey scale
Scale in cm
8.95m
10.13m
11.76m

FMS-HG18-07A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-07A
Date (yy/mm/dd): 18/06/04
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 8
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 11.76 to 12.37
Prepared by: CM / KL
Kodak grey scale
Scale in cm
12.43m

FMS-HG18-07B


GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-07B
Date (yy/mm/dd): 18/06/05
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1 to 2
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 3.26 to 4.85
Prepared by: CM/KL
Kodak grey scale
Scale in cm
3.39m
4.89m
→ 4.85m EOH

FMS-HG18-08A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-08A
Date (yy/mm/dd): 18/07/31
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1-3
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 3.05 to 5.93
Prepared by: CM/KL
Kodak grey scale
Scale in cm
BH

FMS-HG18-08A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-08A
Date (yy/mm/dd): 18/07/31
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 3-5
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 5.93 to 8.79
Prepared by: CM/KL
KODAK Color Control Patches
Kodak grey scale
Scale in cm
6.50
8.00
8.79

FMS-HG18-08A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-08A
Date (yy/mm/dd): 18/07/31
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 5-7
Core Condition (Dry/Wet): WET
Client: Atlantic Gold Corporation
Depth (m): 8.79 to 11.60
Prepared by: CM/KL
Kodak grey scale
Scale in cm

FMS-HG18-08A

FMS-CH Hydrogeo. Investigations
FMS-HG18-08A
RC 5-7 BOX #3
8.79-11.60m
GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-08A
Date (yy/mm/dd): 18/07/31
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 7-8
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 11.60 to 13.93
Prepared by: CM/KL
Kodak grey scale
Scale in cm
11.60m
EOH

FMS-HG18-08B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-08B
Date (yy/mm/dd): 18/08/01
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1-3
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 3.20 to 5.76
Prepared by: CM/KL
Kodak grey scale
3.50
5.00

FMS-HG18-08B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-08B
Date (yy/mm/dd): 18/08/01
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 3
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 5.76 to 6.45
Prepared by: CM/KL
Kodak grey scale
Scale in cm
6.45 EOH

FMS-HG18-09A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-19A
Date (yy/mm/dd): 18/06/06
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1 to 3
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 4.79 to 7.62
Prepared by: CM/KL
Kodak grey scale
Scale in cm
4.88m
6.38

FMS-HG18-09A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-19A
Date (yy/mm/dd): 18/06/06
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 3 to 5
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 7.62 to 10.92
Prepared by: CM/KL
KODAK Color Control Patches
Kodak grey scale
Scale in cm
7.88
9.38

FMS-HG18-09A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-19A
Date (yy/mm/dd): 18/06/07
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 5 to 6
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 10.42 to 12.38
Prepared by: CM/KL
Kodak grey scale
Scale in cm
10.88
12.38

FMS-HG18-09B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-09B
Date (yy/mm/dd): 18/06/07
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 5.81 to 6.32
Prepared by: CM/CDM
Kodak grey scale
Scale in cm
5.81m
6.32m
6.32m← E.O.H
FMS-HG18-09B

FMS-HG18-10A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-10A
Date (yy/mm/dd): 18/06/04
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1-4
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 2.35m-5.04
Prepared by: CM/AKV
Kodak grey scale
Scale in cm
2.35m
3.8m
3.9m
4.67m
5.04m

FMS-HG18-10A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-10A
Date (yy/mm/dd): 18/08/04
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 4-6
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 5.04 to 7.87
Prepared by: CM/AKV
Kodak grey scale
Scale in cm

FMS-HG18-10A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-10A
Date (yy/mm/dd): 18/08/04
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 6 - 7
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 7.87 to 10.74
Prepared by: CM/AKV
Kodak grey scale
Scale in cm
7.87m
10.74m

FMS-HG18-10A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-10A
Date (yy/mm/dd): 18/08/04
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 7 - 8
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 10.74 to 12.31
Prepared by: CM/AKV
KODAK Color Control Patches
Kodak grey scale
Scale in cm
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
10.81m
12.31
12.30m
9.31

FMS-HG18-10B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-10B
Date (yy/mm/dd): 18/08/06
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1-4
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 2.10 to 5.03
Prepared by: AKV / KL
Kodak grey scale
Scale in cm
TOP OF ROCK 2.10m
3.53m
5.03m

FMS-HG18-10B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-10B
Date (yy/mm/dd): 18/08/06
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 4-5
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 5.03 to 6.56
Prepared by: AKV / KL
KODAK Color Control Patches
Kodak grey scale
Scale in cm
5.03
6.56m

FMS-HG18-11A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-11A
Date (yy/mm/dd): 18/08/02
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1-3
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 1.08 to 3.91
Prepared by: CM/KL
Kodak grey scale
Scale in cm
1.08m
1.85
3.43
3.91

FMS-HG18-11A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-11A
Date (yy/mm/dd): 18/08/02
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 3-5
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 3.91 to 6.73
Prepared by: CM/KL
Kodak grey scale
Scale in cm
FMS-HG18-11A

FMS-HG18-11A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-11A
Date (yy/mm/dd): 18/08/02
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 5-7
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 6.73 to 9.49
Prepared by: CM/KL
Kodak grey scale
Scale in cm
6.73 m
7.90
9.49

FMS-HG18-11A

6.73m - 9.49m
GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-11A
Date (yy/mm/dd): 18/08/02
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 7
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 9.49 to 10.92
Prepared by: CM/KL
Kodak grey scale
10.92

FMS-HG18-11B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-11B
Date (yy/mm/dd): 18/08/03
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1-3
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 1.27 to 4.17
Prepared by: CM/KI
KODAK Color Control Patches
Kodak grey scale
Scale in cm
1.27
3.44
4.17

FMS-HG18-11B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-11B
Date (yy/mm/dd): 18/08/03
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 3
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 4.17 to 4.94
Prepared by: CM/KL
Kodak grey scale
Scale in cm
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
FMS-HG18-11B Box 2
4.94 EOH

FMS-HG18-13A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-13A
Date (yy/mm/dd): 13/08/07
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1-3
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 270 to 586
Prepared by: AKV / KL
Kodak gray scale
Scale in cm
3.39
4.97

FMS-HG18-13A

GOLDER
Project Number: 1895674
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Client: Atlantic Gold Corporation
Borehole Number: FMS-HG18-13A
Core Run Number(s): 3-5
Depth (m): 5.86 to 8.38
Date (yy/mm/dd): 13/08/08
Core Condition: (Dry/Wet) WET
Prepared by: AKV / KL
Kodak grey scale
Scale in cm
FMS-HG18-13A
6.39
7.17
8.38

FMS-HG18-13A

1895678 - FMS+CH HYDROGEO. INVESTIGATIONS
FMS-HG18-10A
CR3-CR5
BOX 2
5.86-8.38m
GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-13A
Date (yy/mm/dd): 18/08/08
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 5-6
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 8.38 to 10.89
Prepared by: AKV / KL
KODAK Color Control Patches
Kodak grey scale
Scale in cm
8.38m
9.28m
10.89 M

FMS-HG18-13A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-13A
Date (yy/mm/dd): 13/08/08
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 7
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 10.87 to 12.43
Prepared by: AKV / KL
Kodak gray scale
Scale in cm
FMS-HG18-13A
12.43

FMS-HG18-13B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-13B
Date (yy/mm/dd): 13/08/09
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1-4
Core Condition: (Dry/Wet) DRY
Client: Atlantic Gold Corporation
Depth (m): 2.59 to 5.62
Prepared by: AKV / KL
Kodak grey scale
Scale in cm
2.59m
3.08M
3.51M
5.62m

FMS-HG18-14A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-14A
Date (yy/mm/dd): 18/06/08
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1 to 4
Core Condition: (Dry/Wet) wet
Client: Atlantic Gold Corporation
Depth (m): 2.74 to 5.34
Prepared by: CM/CDM
KODAK Color Control Patches
Kodak grey scale
Scale in cm
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
FMS-HG18-14A-BOX1
.35 HVN
> 5.34m

FMS-HG18-14A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-14A
Date (yy/mm/dd): 18/06/06
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 4 to 6
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 5.34 to 7.96
Prepared by: CM/CDM
KODAK Color Control Patches
Kodak grey scale
Scale in cm
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
5.34
6.31
7.81

FMS-HG18-14A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-14A
Date (yy/mm/dd): 18/06/06
Project Title: Hydrogeological Investigations Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 6 to 7
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 7.96 to 10.69
Prepared by: CM/CDM
KODAK Color Control Patches
Kodak grey scale
Scale in cm
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
FMS-HG18-14A
7.96m
10.69

FMS-HG18-14A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-14A
Date (yy/mm/dd): 18/06/08
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 7 to 9
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 10.69 to 13.35
Prepared by: CM/COM
KODAK Color Control Patches
Kodak grey scale
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
Scale in cm
10.69
12.31
13.35

FMS-HG18-14A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-14A
Date (yy/mm/dd): 18/06/08
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 9
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 13.35 to 13.81
Prepared by: CM/COM
Kodak grey scale
Scale in cm
13.81
13.81m EOH

FMS-HG18-14B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-14B
Date (yy/mm/dd): 18/06/10
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1 to 5
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 2.50 to 5.13
Prepared by: CM/CDM
KODAK Color Control Patches
Kodak grey scale
Scale in cm
2.30M
FMS-HG18-14B
3.33m
3.70
4.83m
5.13m

FMS-HG18-14B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-14B
Date (yy/mm/dd): 18/06/10
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 5 to 6
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 5.13 to 7.83
Prepared by: CM/COM
KODAK Color Control Patches
Kodak grey scale
Scale in cm
5.13m
6.33
7.83m
17.83m

FMS-HG18-15A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-15A
Date (yy/mm/dd): 18/06/12
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1 to 4
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 2.35 to 4.92
Prepared by: CM/CDM
KODAK Color Control Patches
Kodak grey scale
Scale in cm
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
3.09
FMS-HG18-15A

FMS-HG18-15A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-15A
Date (yy/mm/dd): 18/06/12
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 4 to 5
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 4.92 to 7.75
Prepared by: CM/CDM
Kodak grey scale
Scale in cm
FMS-HG18-15A Box 2

FMS-HG18-15A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-15A
Date (yy/mm/dd): 18/06/12
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 5 to 7
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 7.75 to 10.45
Prepared by: CM/COM
KODAK Color Control Patches
Kodak grey scale
Scale in cm
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
FMS-HG18-15A
7.54
9.34
CO
.56
.26

FMS-HG18-15A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-15A
Date (yy/mm/dd): 18/06/12
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 7
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 10.45 to 10.83
Prepared by: CM/CDM
Kodak grey scale
Scale in cm
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

FMS-HG18-15B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-15B
Date (yy/mm/dd): 18/06/13
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1 to 2
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 2.01 to 4.17
Prepared by: CM/CDM
Kodak grey scale
Scale in cm
4.17
14.13 m EOH

FMS-HG18-16A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-16A
Date (yy/mm/dd): 18/08/10
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1-4
Core Condition: (Dry/Wet) WET
Client: Atlantic Gold Corporation
Depth (m): 2.06 to 5.20
Prepared by: AKV / KL
KODAK Color Control Patches
Kodak grey scale
Scale in cm

FMS-HG18-16A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-16A
Date (yy/mm/dd): 18/08/10
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 4-5
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 5.20 to 7.99
Prepared by: AKV / KL
Kodak grey scale
Scale in cm
6.52m
8.02m

FMS-HG18-16A

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-16A
Date (yy/mm/dd): 18/08/10
Project Title: Hydrogeological Investigations - Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 6 - 7
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 7.99 to 11.02
Prepared by: AKV / KL
Kodak grey scale

FMS-HG18-16B

GOLDER
Project Number: 1895674
Borehole Number: FMS-HG18-16B
Date (yy/mm/dd): 18/08/11
Project Title: Hydrogeological Investigations Fifteen Mile Stream and Cochrane Hill
Core Run Number(s): 1 to 3
Core Condition: (Dry/Wet) Wet
Client: Atlantic Gold Corporation
Depth (m): 3.06 to 5.65
Prepared by: AKV/MA
Kodak grey scale
3.54m
4.84m
5.65m

APPENDIX C

Overburden Grain Size Distribution Results

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-02X**
Depth	**0.70m**
Sample No.	**SS2**
Date Received	
Sample Description	
Comments :	

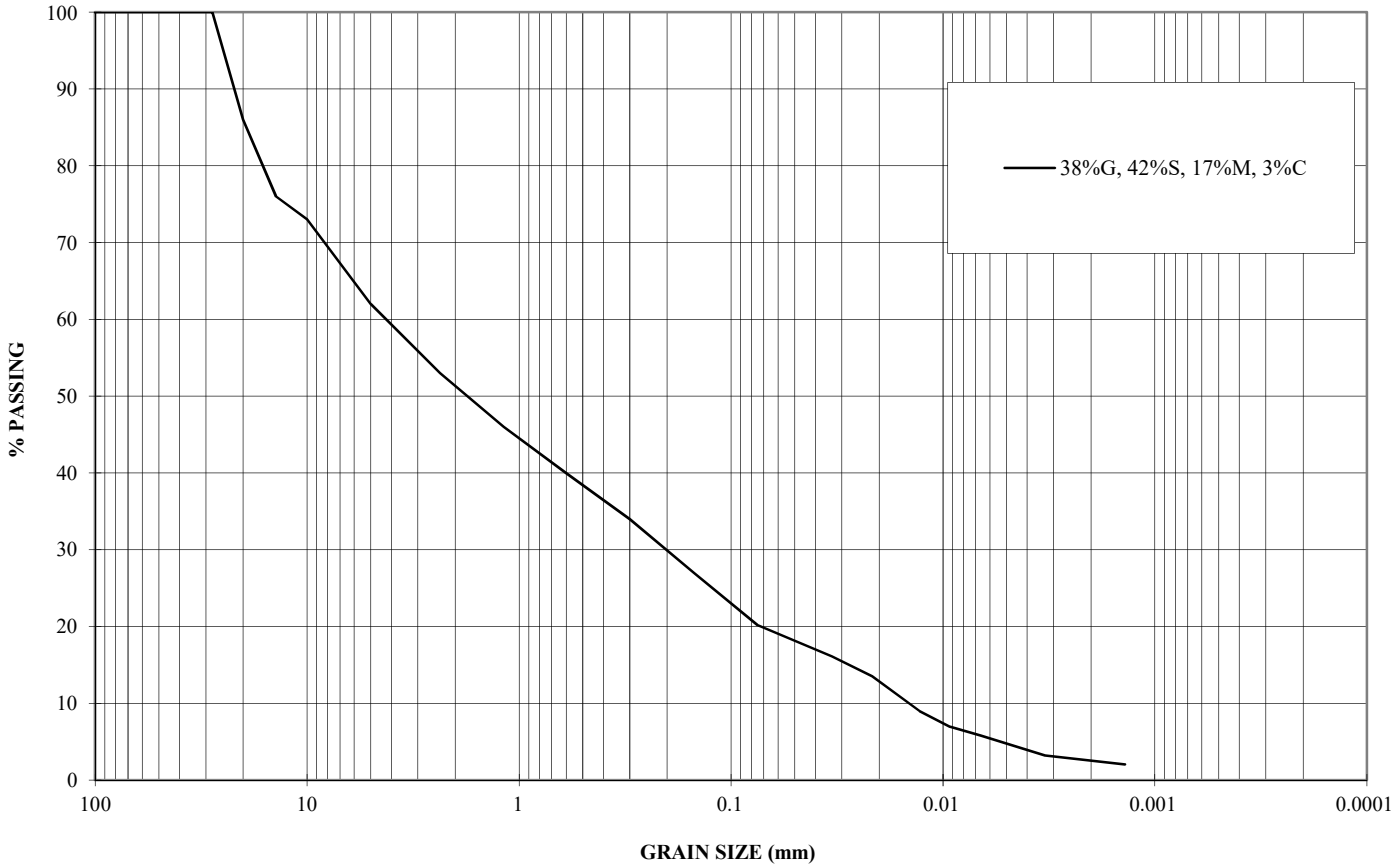
Moisture = 4.2%

Metric Sieve Analysis

	Sieve Size ASTM	Metric (mm)	% Passing
	4"	112	100
	3"	80	100
	2"	56	100
	1 1/2"	40	100
	1"	28	100
	3/4"	20	86
	1/2"	14	76
	3/8"	10	73
	No. 4	5	62
	No. 8	2.36	53
	No. 16	1.18	46
	No. 30	0.6	40
	No. 50	0.3	34
	No. 100	0.15	27
	No. 200	0.075	20.2
Hydrometer Analysis		0.0333	16.1
		0.0215	13.5
		0.0129	9.0
		0.0093	7.0
		0.0066	5.8
		0.0033	3.2
		0.0014	2.1

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-02X - SS2	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-03A**
Depth	**0.31**
Sample No.	**SS1**
Date Received	
Sample Description	
Comments :	

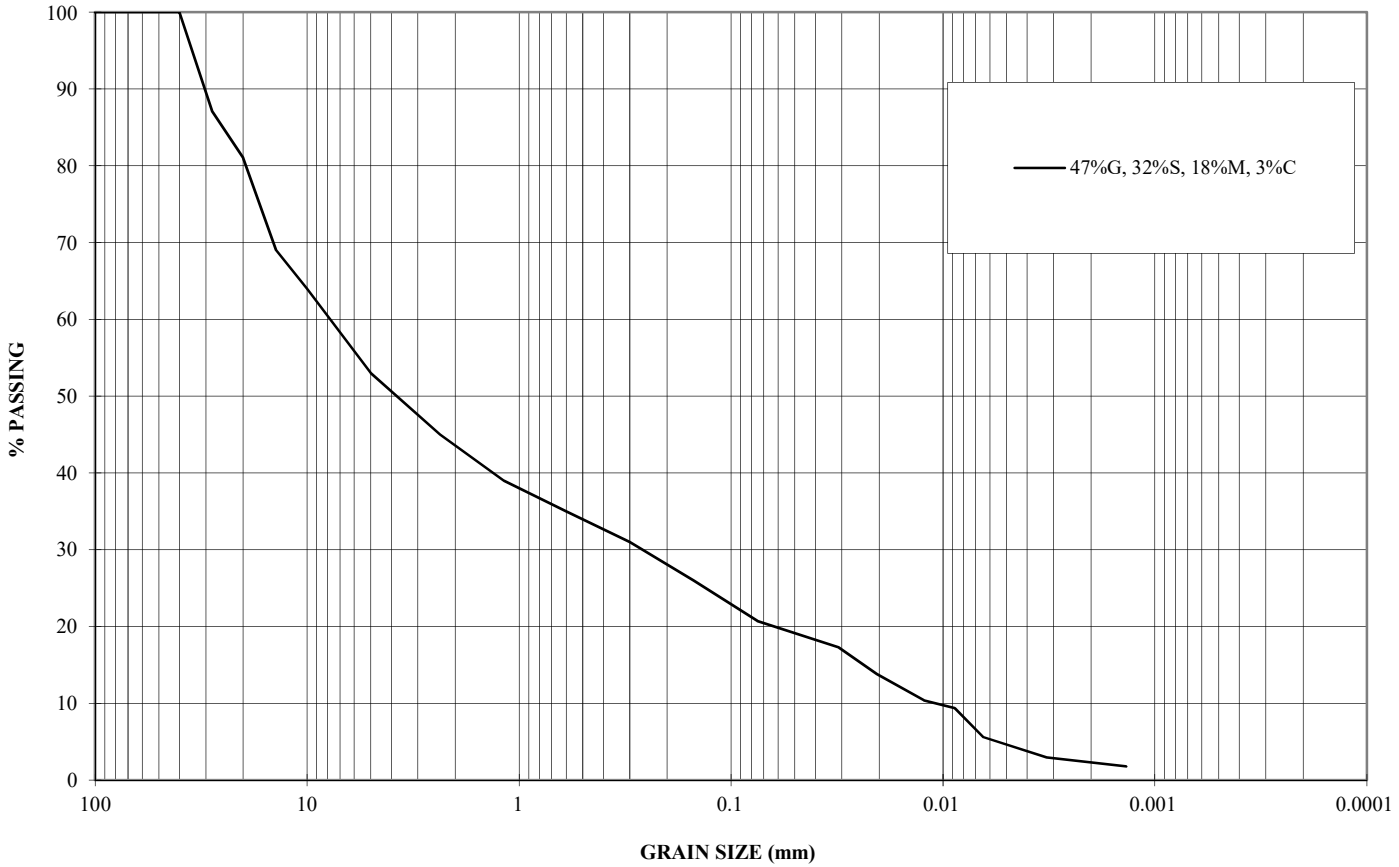
Moisture = 4.4%

Metric Sieve Analysis

	Sieve Size ASTM	Metric (mm)	% Passing
	4"	112	100
	3"	80	100
	2"	56	100
	1 1/2"	40	100
	1"	28	87
	3/4"	20	81
	1/2"	14	69
	3/8"	10	64
	No. 4	5	53
	No. 8	2.36	45
	No. 16	1.18	39
	No. 30	0.6	35
	No. 50	0.3	31
	No. 100	0.15	26
	No. 200	0.075	20.7
Hydrometer Analysis		0.0311	17.3
		0.0205	13.8
		0.0123	10.4
		0.0088	9.4
		0.0065	5.6
		0.0032	3.0
		0.0014	1.8

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-03A - SS1	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-03A**
Depth	**1.09m**
Sample No.	**SS3**
Date Received	
Sample Description	
Comments :	**Non-Plastic**

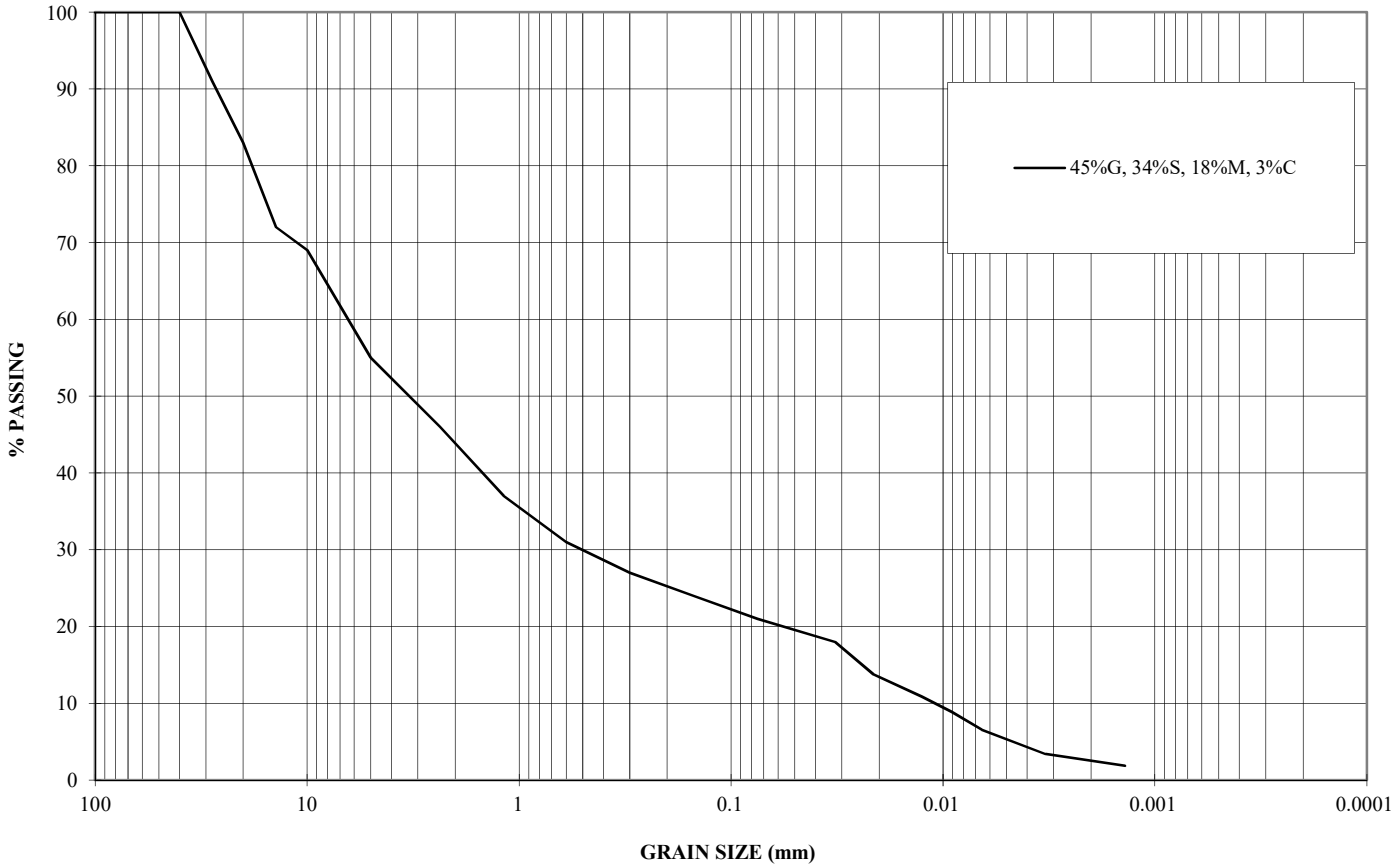
Moisture = 7.1%

Metric Sieve Analysis

Sieve Size ASTM	Metric (mm)	% Passing
4"	112	100
3"	80	100
2"	56	100
1 1/2"	40	100
1"	28	91
3/4"	20	83
1/2"	14	72
3/8"	10	69
No. 4	5	55
No. 8	2.36	46
No. 16	1.18	37
No. 30	0.6	31
No. 50	0.3	27
No. 100	0.15	24
No. 200	0.075	21.0
Hydrometer Analysis	0.0322	18.0
	0.0212	13.8
	0.0126	10.9
	0.0091	8.9
	0.0065	6.5
	0.0033	3.4
	0.0014	1.9

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-03A - SS3	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-03A**
Depth	**3.99m**
Sample No.	**SS7**
Date Received	
Sample Description	
Comments :	

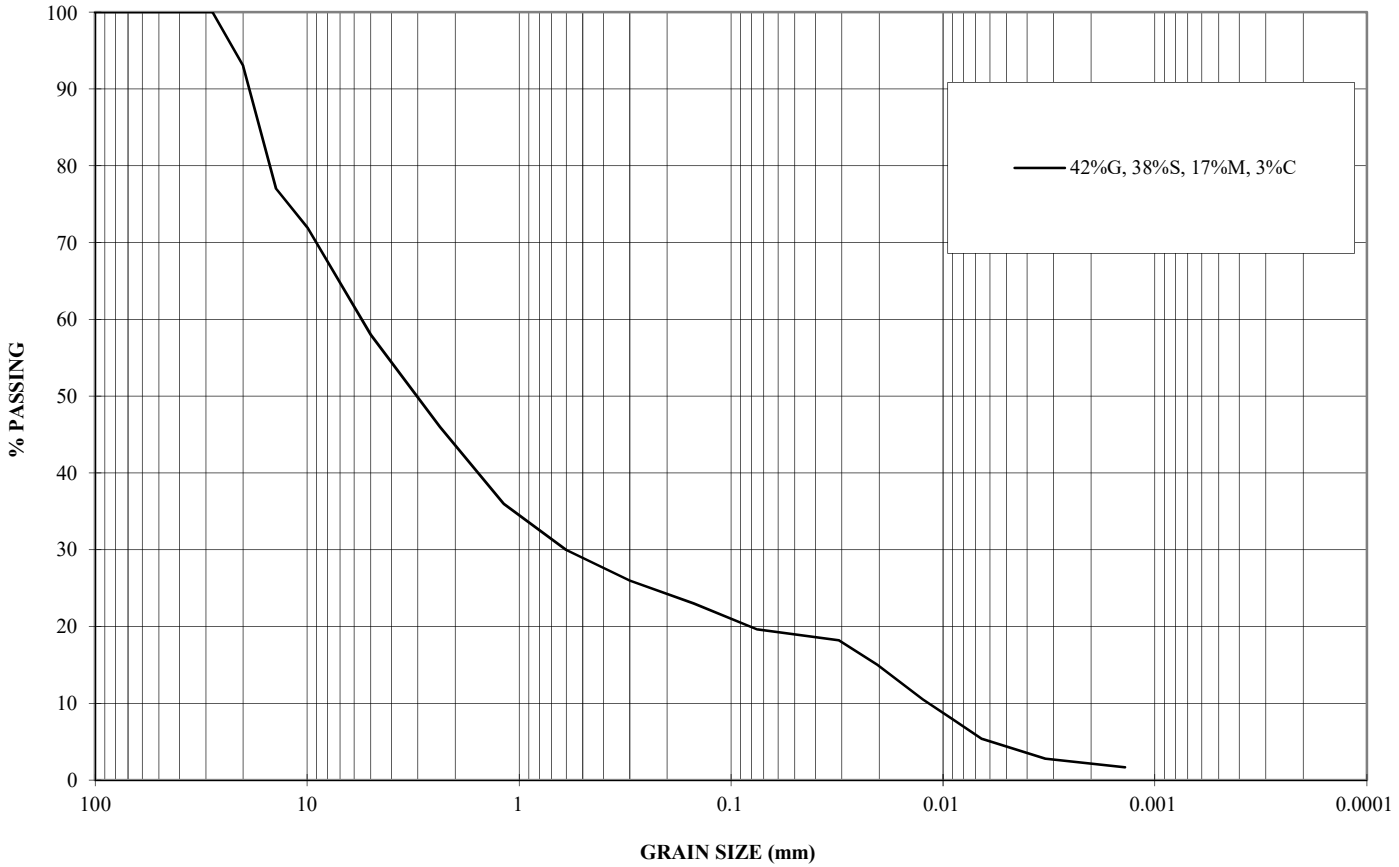
Moisture = 7.2%

Metric Sieve Analysis

	Sieve Size ASTM	Metric (mm)	% Passing
	4"	112	100
	3"	80	100
	2"	56	100
	1 1/2"	40	100
	1"	28	100
	3/4"	20	93
	1/2"	14	77
	3/8"	10	72
	No. 4	5	58
	No. 8	2.36	46
	No. 16	1.18	36
	No. 30	0.6	30
	No. 50	0.3	26
	No. 100	0.15	23
	No. 200	0.075	19.6
Hydrometer Analysis		0.0311	18.2
		0.0204	15.0
		0.0124	10.5
		0.0090	7.9
		0.0065	5.3
		0.0033	2.8
		0.0014	1.7

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-03A - SS7	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-03A**
Depth	**6.23m**
Sample No.	**SS8**
Date Received	
Sample Description	
Comments :	**Non-Plastic**

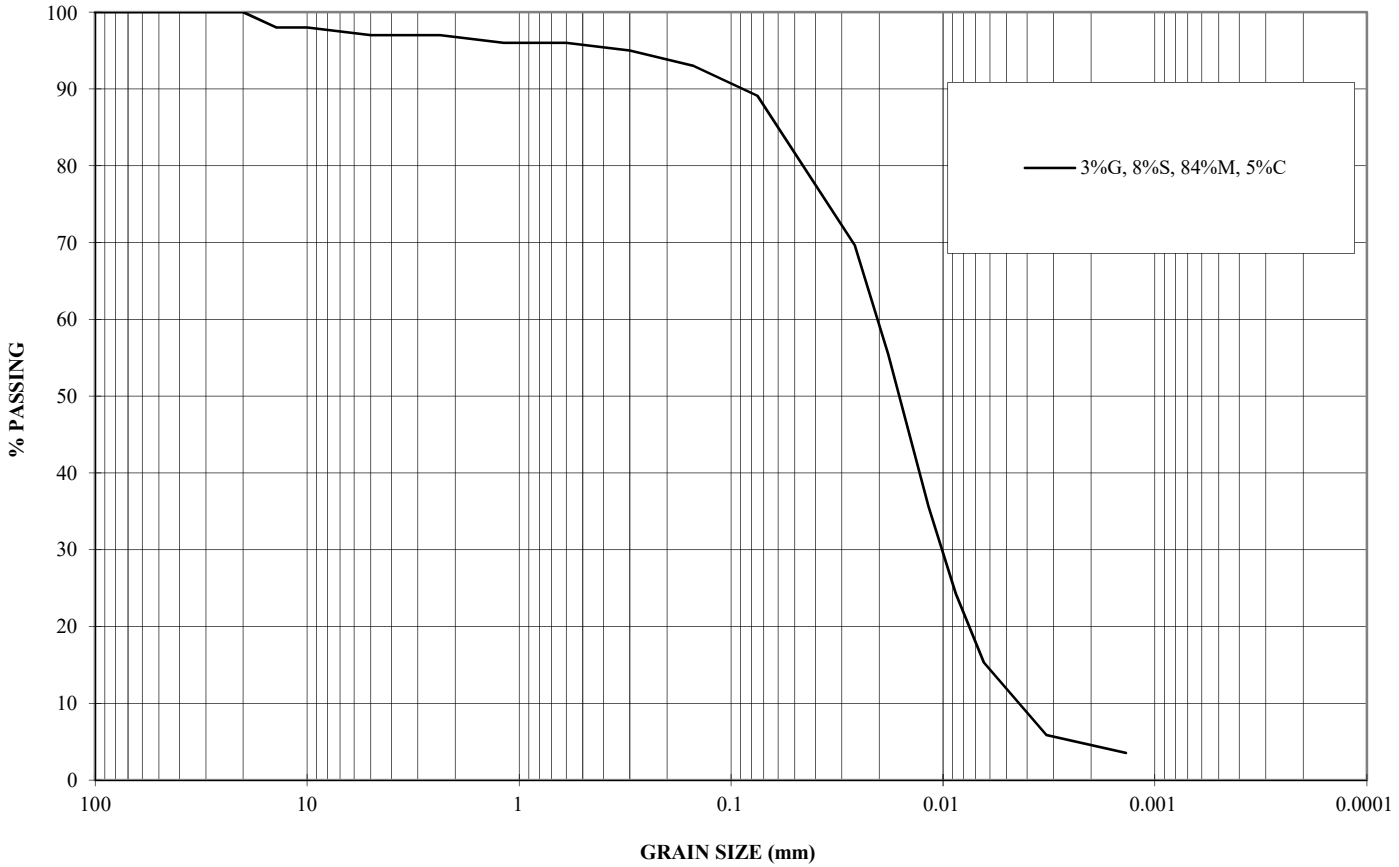
Moisture = 22.4%

Metric Sieve Analysis

Sieve Size ASTM	Metric (mm)	% Passing
4"	112	100
3"	80	100
2"	56	100
1 1/2"	40	100
1"	28	100
3/4"	20	100
1/2"	14	98
3/8"	10	98
No. 4	5	97
No. 8	2.36	97
No. 16	1.18	96
No. 30	0.6	96
No. 50	0.3	95
No. 100	0.15	93
No. 200	0.075	89.1
Hydrometer Analysis	0.0260	69.6
	0.0181	55.4
	0.0117	35.6
	0.0087	24.3
	0.0064	15.3
	0.0033	5.9
	0.0014	3.5

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-03A - SS8	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-04A**
Depth	**2.11m**
Sample No.	**SS3**
Date Received	
Sample Description	
Comments :	

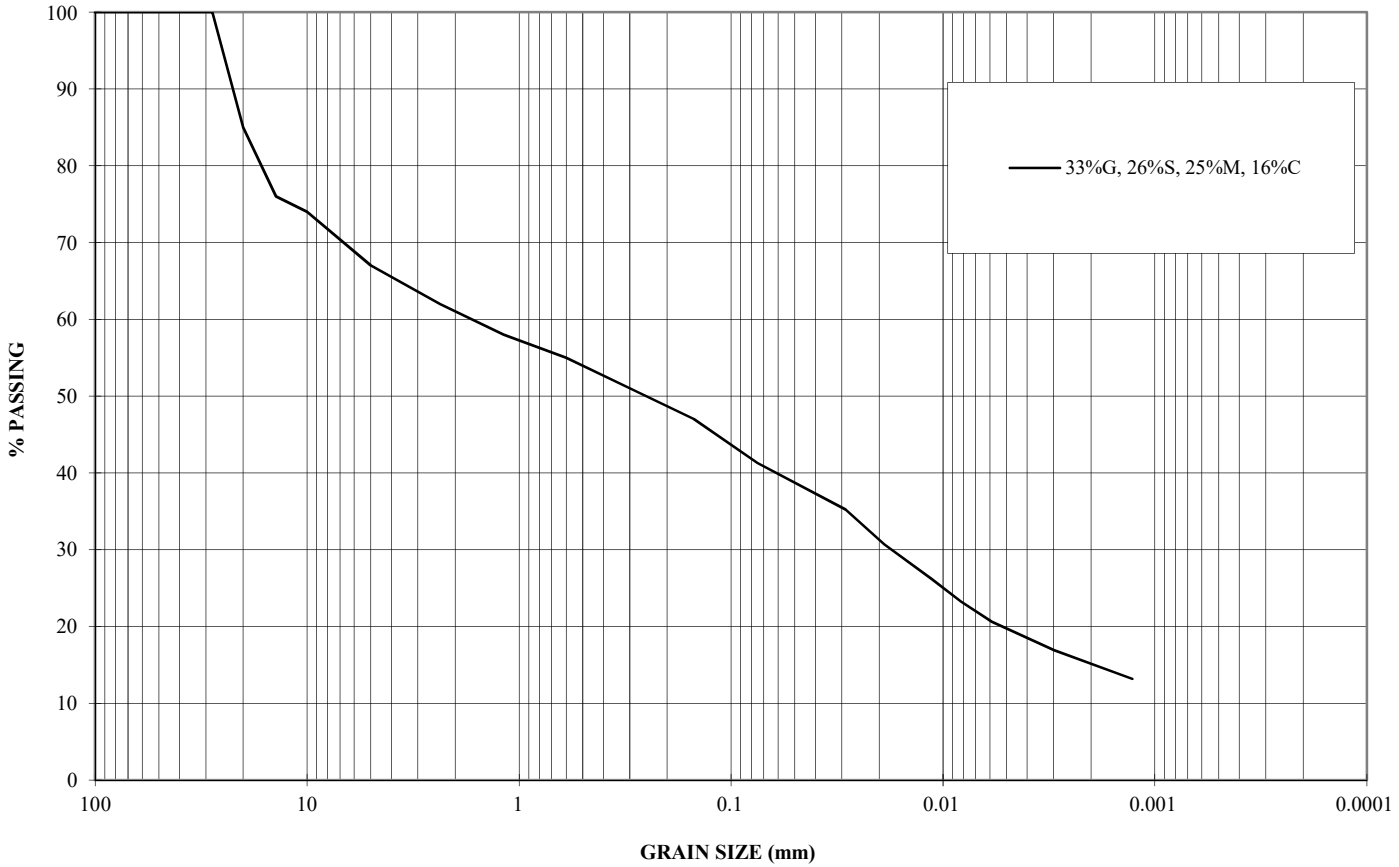
Moisture = 12.1%

Metric Sieve Analysis

	Sieve Size ASTM	Metric (mm)	% Passing
	4"	112	100
	3"	80	100
	2"	56	100
	1 1/2"	40	100
	1"	28	100
	3/4"	20	85
	1/2"	14	76
	3/8"	10	74
	No. 4	5	67
	No. 8	2.36	62
	No. 16	1.18	58
	No. 30	0.6	55
	No. 50	0.3	51
	No. 100	0.15	47
	No. 200	0.075	41.3
Hydrometer Analysis		0.0287	35.2
		0.0189	30.7
		0.0114	26.2
		0.0082	23.2
		0.0059	20.7
		0.0030	16.9
		0.0013	13.2

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-04A - SS3	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-04A**
Depth	**3.69m**
Sample No.	**SS5**
Date Received	
Sample Description	
Comments :	**Non-Plastic**

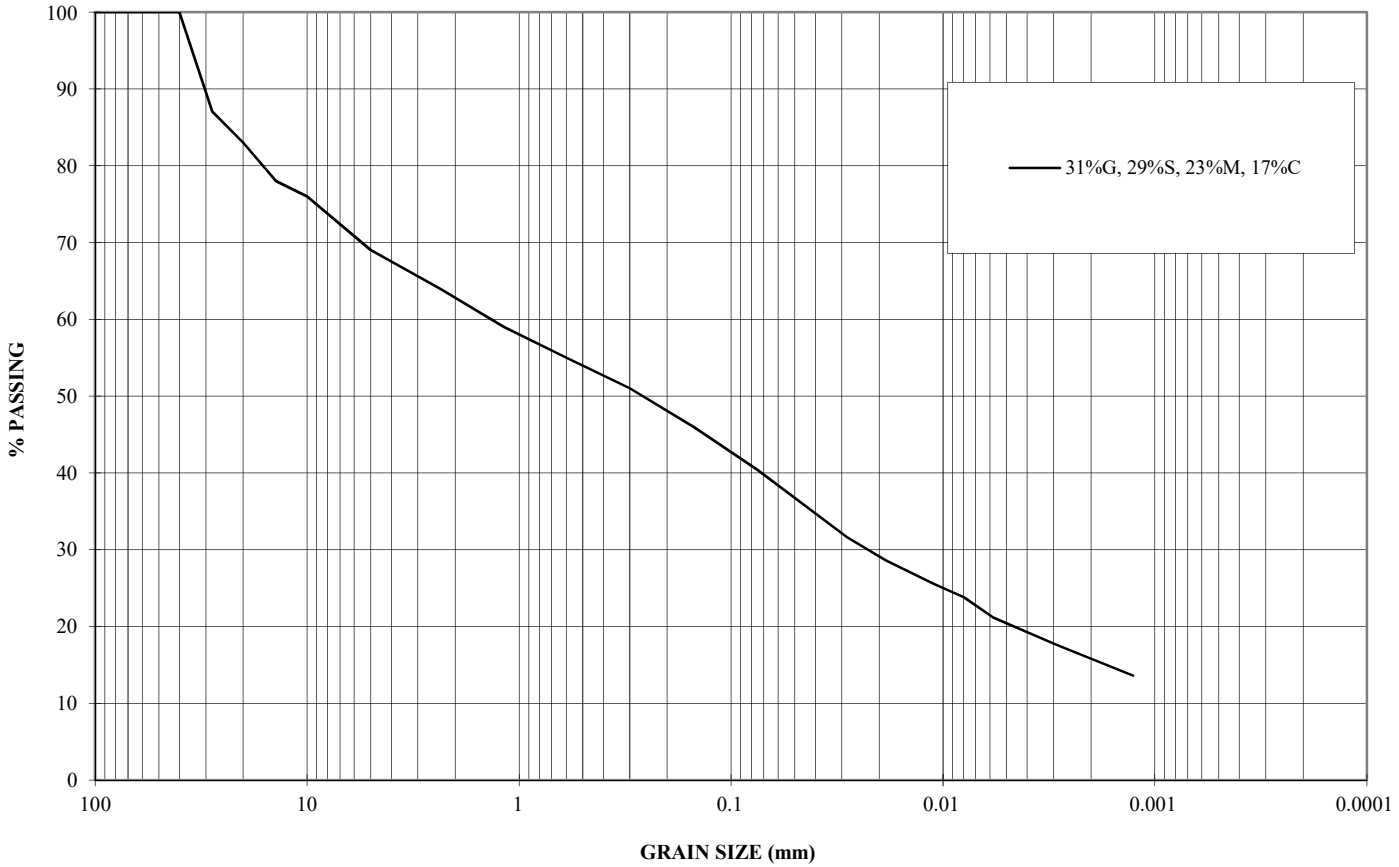
Moisture = 12.0%

Metric Sieve Analysis

	Sieve Size ASTM	Metric (mm)	% Passing
	4"	112	100
	3"	80	100
	2"	56	100
	1 1/2"	40	100
	1"	28	87
	3/4"	20	83
	1/2"	14	78
	3/8"	10	76
	No. 4	5	69
	No. 8	2.36	64
	No. 16	1.18	59
	No. 30	0.6	55
	No. 50	0.3	51
	No. 100	0.15	46
	No. 200	0.075	40.4
Hydrometer Analysis		0.0283	31.6
		0.0185	28.6
		0.0111	25.6
		0.0080	23.8
		0.0058	21.2
		0.0029	17.6
		0.0013	13.6

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-04A - SS5	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-05A**
Depth	**0.29m**
Sample No.	**SS1B**
Date Received	
Sample Description	
Comments :	

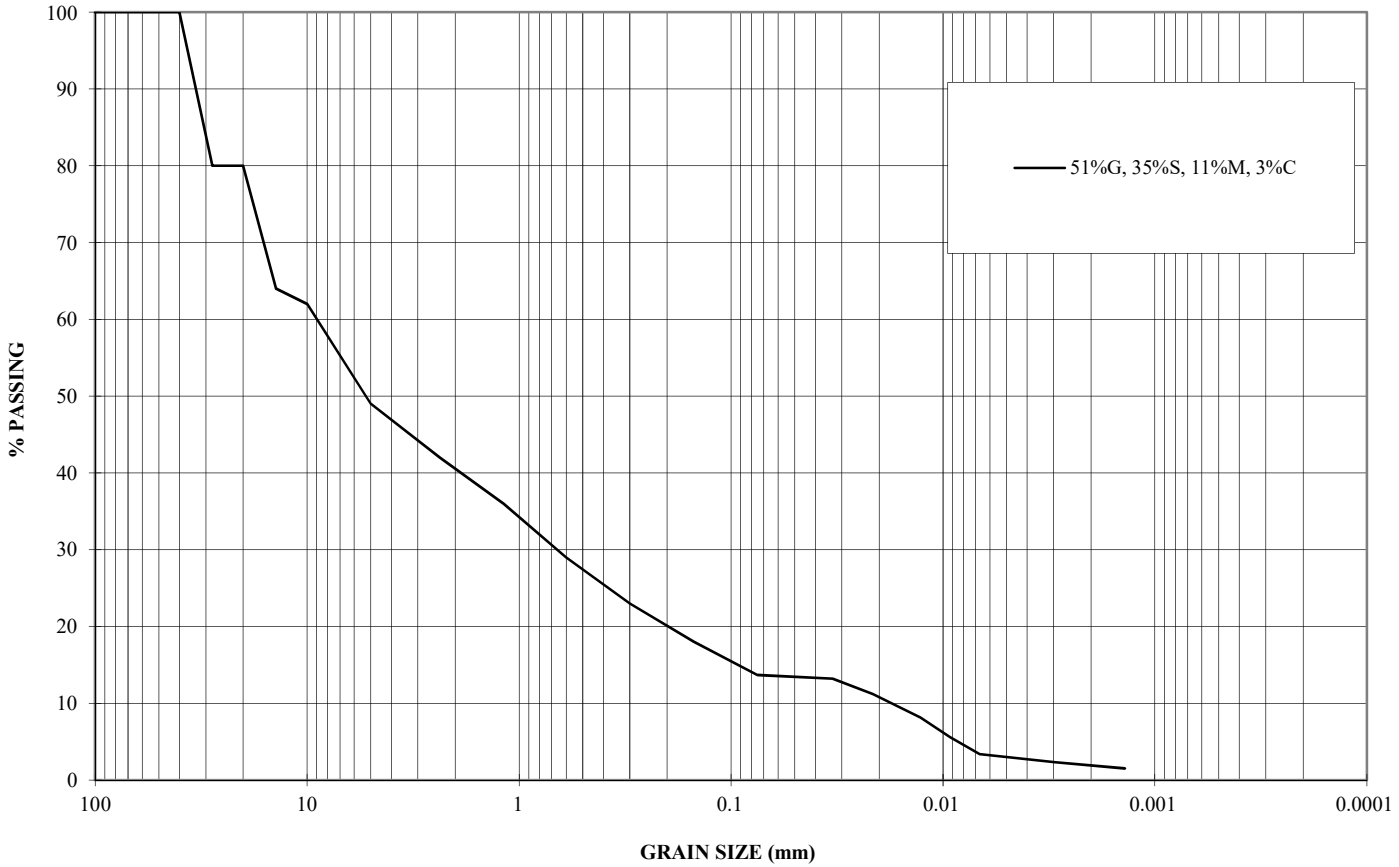
Moisture = 11.4%

Metric Sieve Analysis

	Sieve Size ASTM	Metric (mm)	% Passing
	4"	112	100
	3"	80	100
	2"	56	100
	1 1/2"	40	100
	1"	28	80
	3/4"	20	80
	1/2"	14	64
	3/8"	10	62
	No. 4	5	49
	No. 8	2.36	42
	No. 16	1.18	36
	No. 30	0.6	29
	No. 50	0.3	23
	No. 100	0.15	18
	No. 200	0.075	13.7
Hydrometer Analysis		0.0332	13.2
		0.0214	11.2
		0.0128	8.1
		0.0093	5.6
		0.0067	3.4
		0.0030	2.3
		0.0014	1.5

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-05A - SS1B	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-05A**
Depth	**1.84m**
Sample No.	**SS3**
Date Received	
Sample Description	
Comments :	

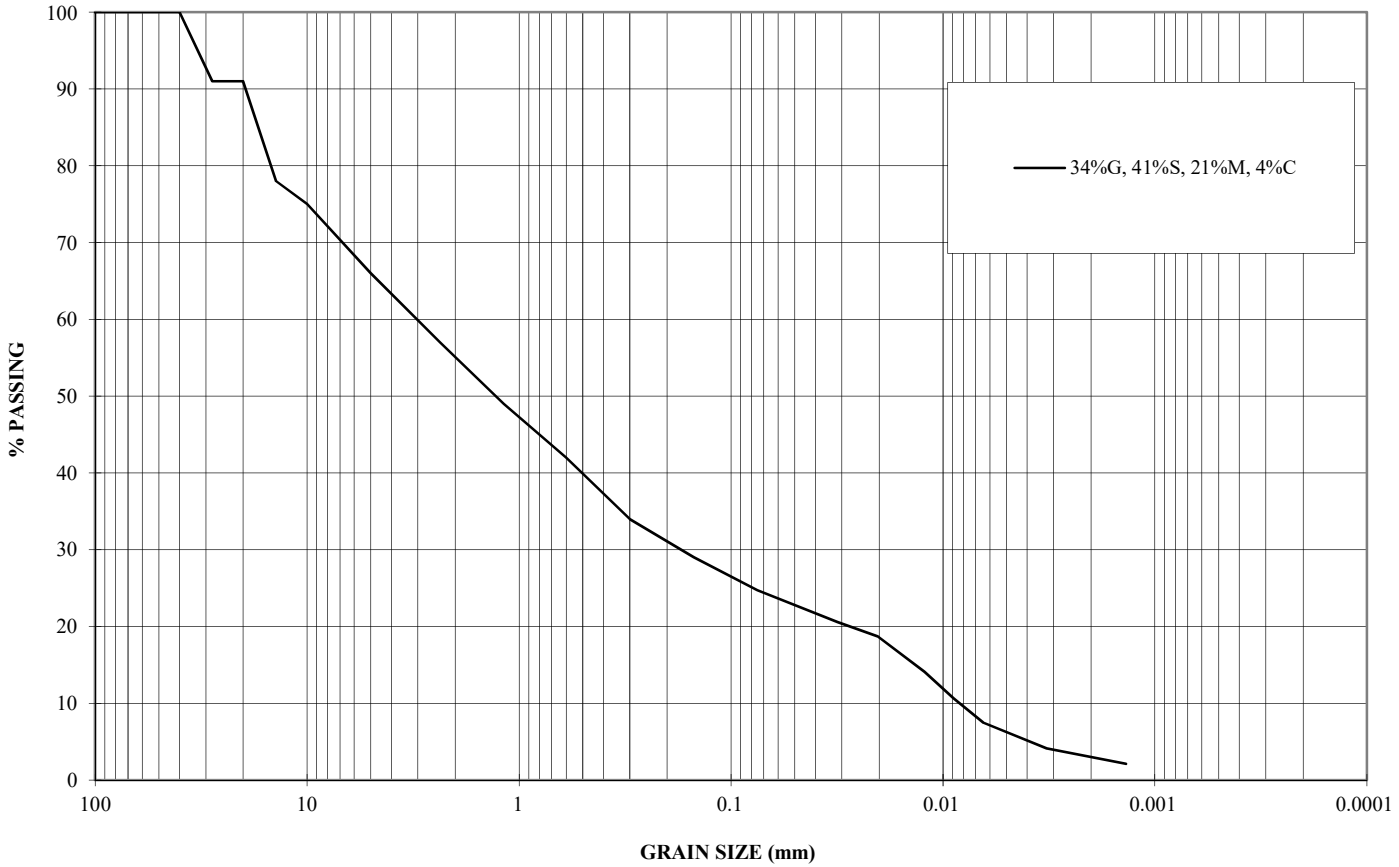
Moisture = 10.8%

Metric Sieve Analysis

Sieve Size ASTM	Metric (mm)	% Passing
4"	112	100
3"	80	100
2"	56	100
1 1/2"	40	100
1"	28	91
3/4"	20	91
1/2"	14	78
3/8"	10	75
No. 4	5	66
No. 8	2.36	57
No. 16	1.18	49
No. 30	0.6	42
No. 50	0.3	34
No. 100	0.15	29
No. 200	0.075	24.7
Hydrometer Analysis	0.0315	20.6
	0.0203	18.7
	0.0122	14.1
	0.0089	10.6
	0.0064	7.5
	0.0032	4.1
	0.0014	2.1

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-05A - SS3	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-05A**
Depth	**3.36m**
Sample No.	**SS5**
Date Received	
Sample Description	
Comments :	**Non-Plastic**

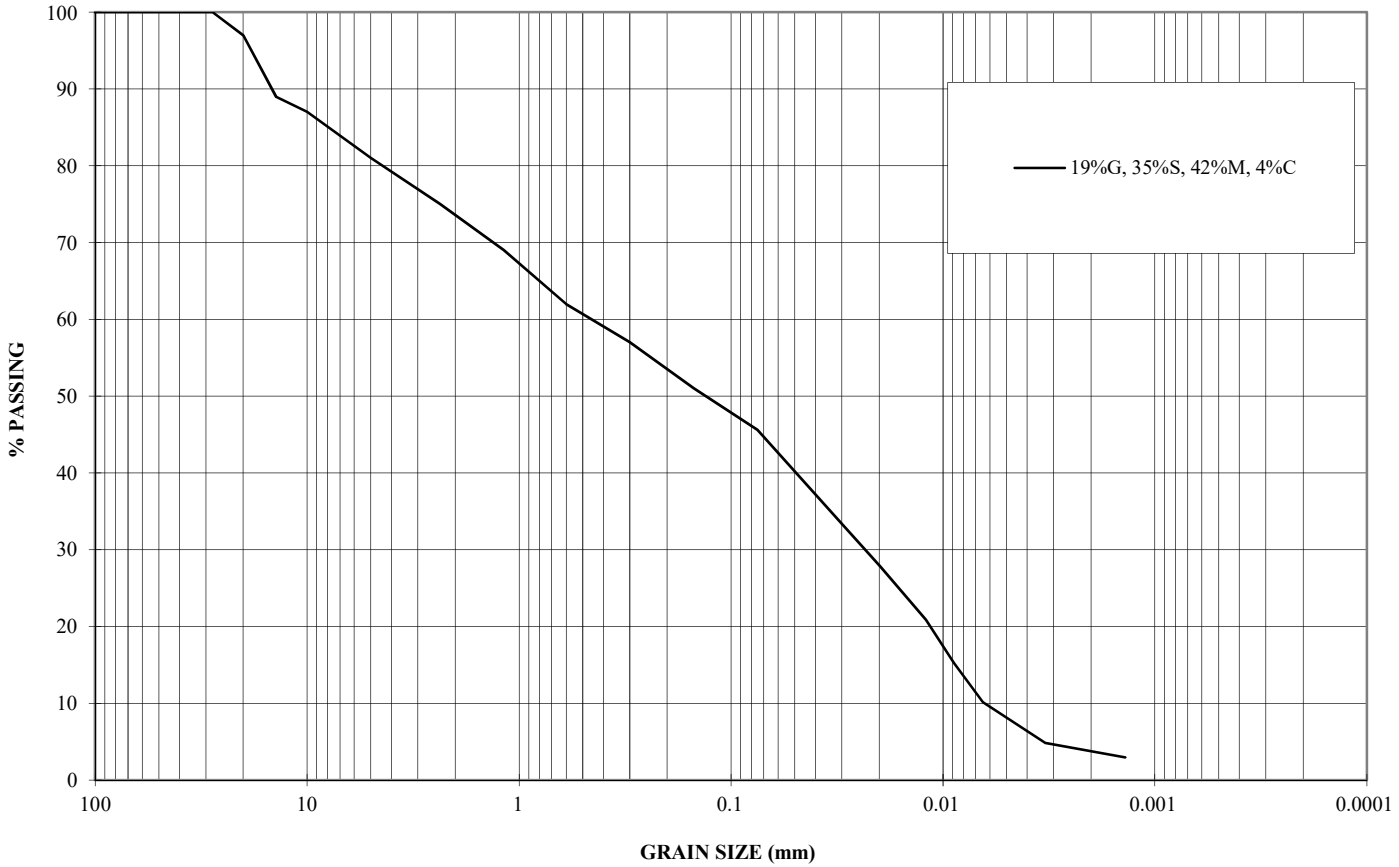
Moisture = 14.6%

Metric Sieve Analysis

Sieve Size ASTM	Metric (mm)	% Passing
4"	112	100
3"	80	100
2"	56	100
1 1/2"	40	100
1"	28	100
3/4"	20	97
1/2"	14	89
3/8"	10	87
No. 4	5	81
No. 8	2.36	75
No. 16	1.18	69
No. 30	0.6	62
No. 50	0.3	57
No. 100	0.15	51
No. 200	0.075	45.6
Hydrometer Analysis	0.0299	33.3
	0.0198	27.9
	0.0121	20.9
	0.0089	15.3
	0.0065	10.1
	0.0033	4.8
	0.0014	3.0

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-05A - SS5	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-06A**
Depth	**1.84m**
Sample No.	**SS3**
Date Received	
Sample Description	
Comments :	

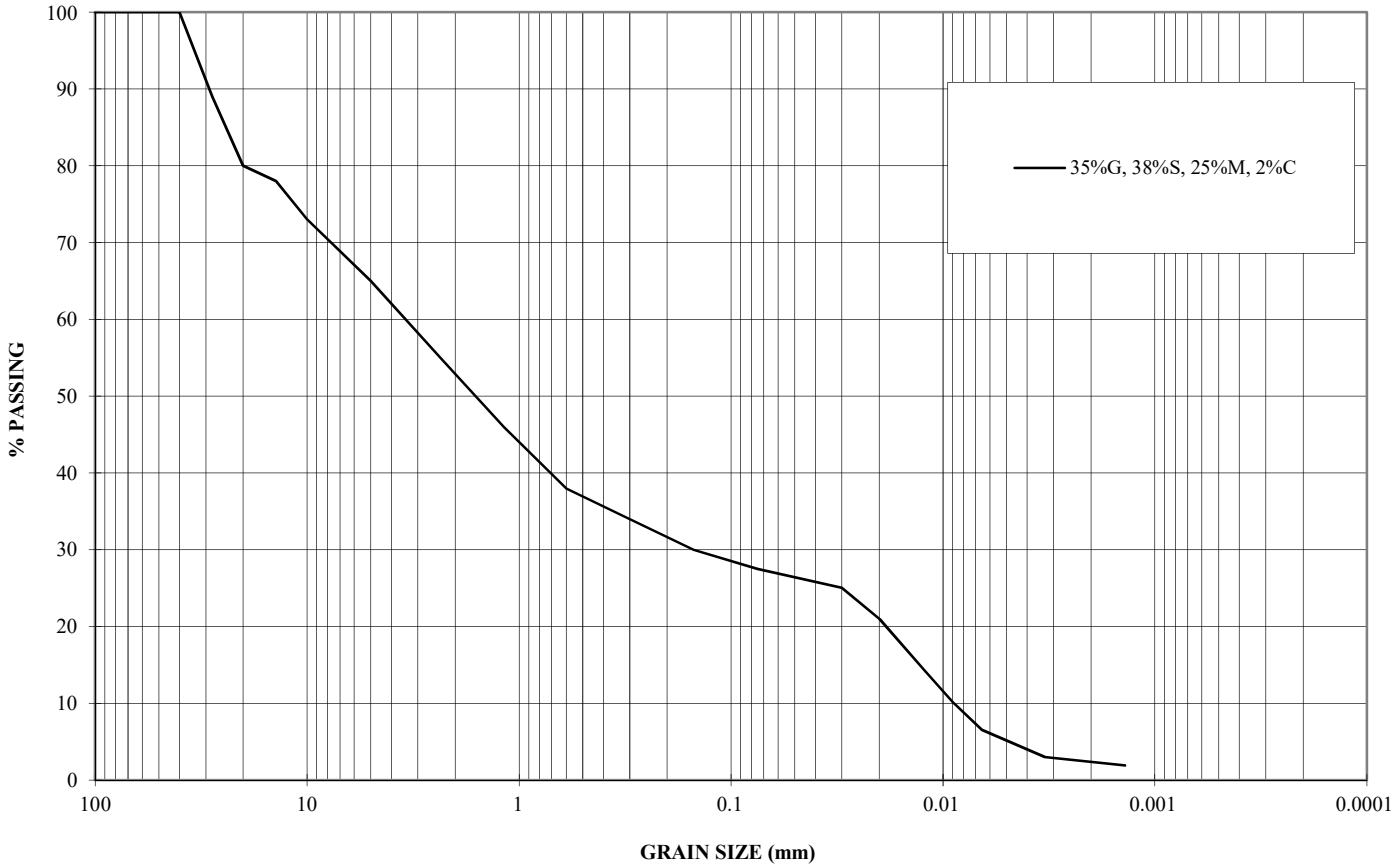
Moisture = 10.3%

Metric Sieve Analysis

	Sieve Size ASTM	Metric (mm)	% Passing
	4"	112	100
	3"	80	100
	2"	56	100
	1 1/2"	40	100
	1"	28	89
	3/4"	20	80
	1/2"	14	78
	3/8"	10	73
	No. 4	5	65
	No. 8	2.36	55
	No. 16	1.18	46
	No. 30	0.6	38
	No. 50	0.3	34
	No. 100	0.15	30
	No. 200	0.075	27.5
Hydrometer Analysis		0.0300	25.0
		0.0199	21.0
		0.0122	14.3
		0.0090	10.1
		0.0065	6.6
		0.0033	3.0
		0.0014	1.9

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-06A - SS3	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-07A**
Depth	**0.92m**
Sample No.	**SS2**
Date Received	
Sample Description	
Comments :	

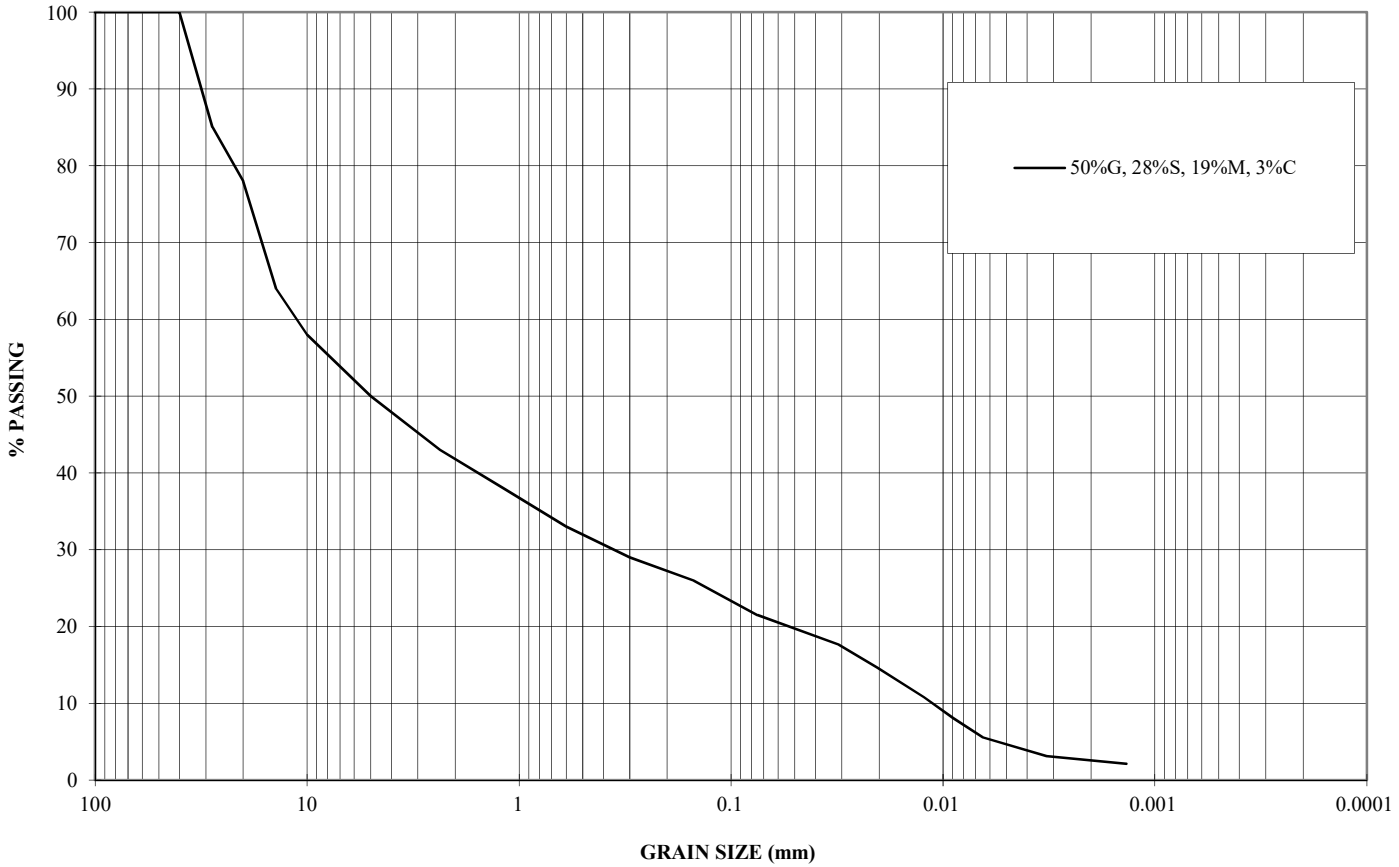
Moisture = 14.0%

Metric Sieve Analysis

	Sieve Size ASTM	Metric (mm)	% Passing
	4"	112	100
	3"	80	100
	2"	56	100
	1 1/2"	40	100
	1"	28	85
	3/4"	20	78
	1/2"	14	64
	3/8"	10	58
	No. 4	5	50
	No. 8	2.36	43
	No. 16	1.18	38
	No. 30	0.6	33
	No. 50	0.3	29
	No. 100	0.15	26
	No. 200	0.075	21.5
Hydrometer Analysis		0.0311	17.7
		0.0204	14.6
		0.0123	10.8
		0.0089	8.1
		0.0065	5.5
		0.0032	3.1
		0.0014	2.1

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-07A - SS2	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-07A**
Depth	**2.75m**
Sample No.	**SS4**
Date Received	
Sample Description	
Comments :	

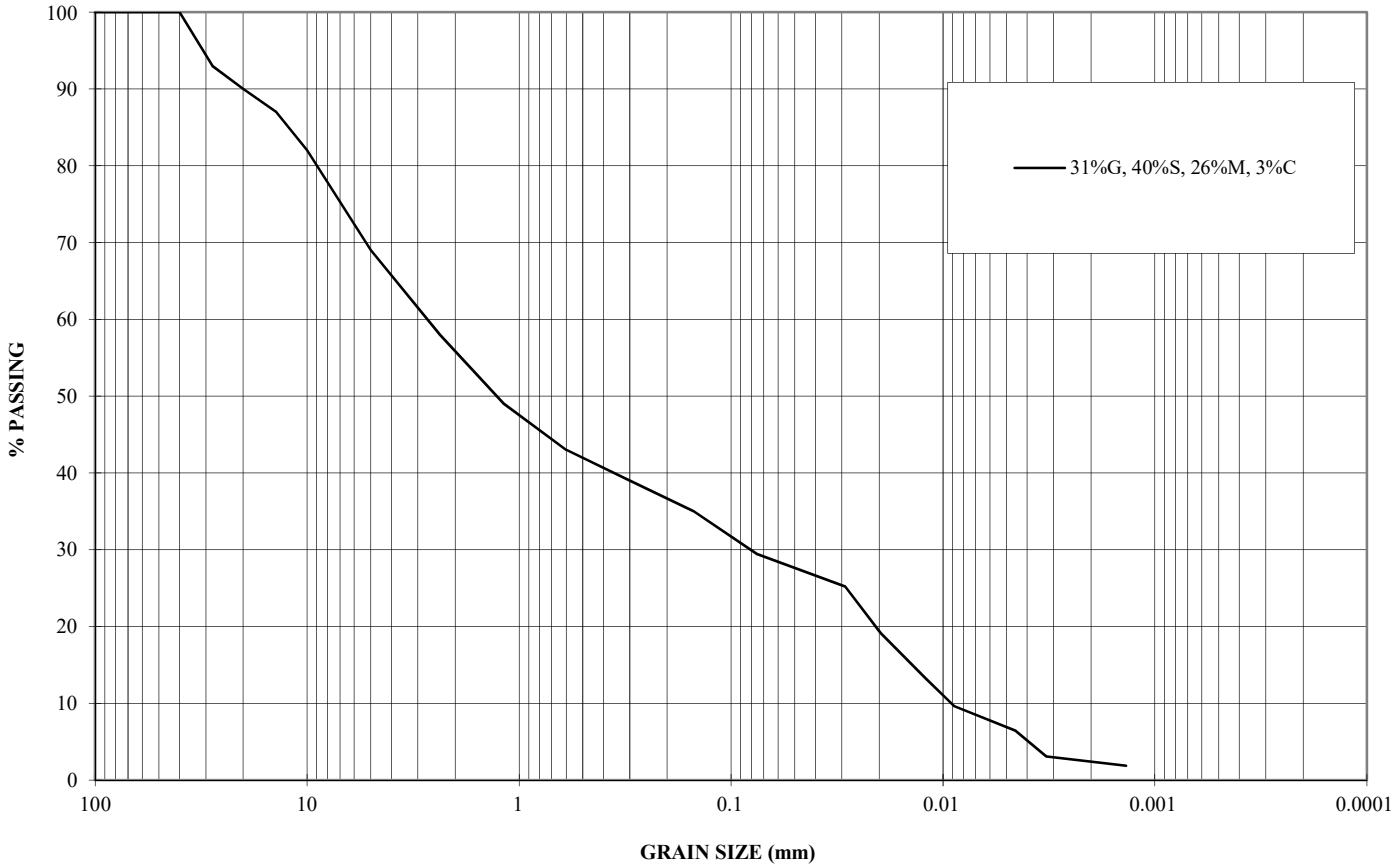
Moisture = 10.3%

Metric Sieve Analysis

	Sieve Size ASTM	Metric (mm)	% Passing
	4"	112	100
	3"	80	100
	2"	56	100
	1 1/2"	40	100
	1"	28	93
	3/4"	20	90
	1/2"	14	87
	3/8"	10	82
	No. 4	5	69
	No. 8	2.36	58
	No. 16	1.18	49
	No. 30	0.6	43
	No. 50	0.3	39
	No. 100	0.15	35
	No. 200	0.075	29.4
Hydrometer Analysis		0.0289	25.2
		0.0197	19.2
		0.0121	13.3
		0.0089	9.6
		0.0046	6.5
		0.0033	3.1
		0.0014	1.9

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-07A - SS4	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-08A**
Depth	**0.80m**
Sample No.	**SS2**
Date Received	
Sample Description	
Comments :	

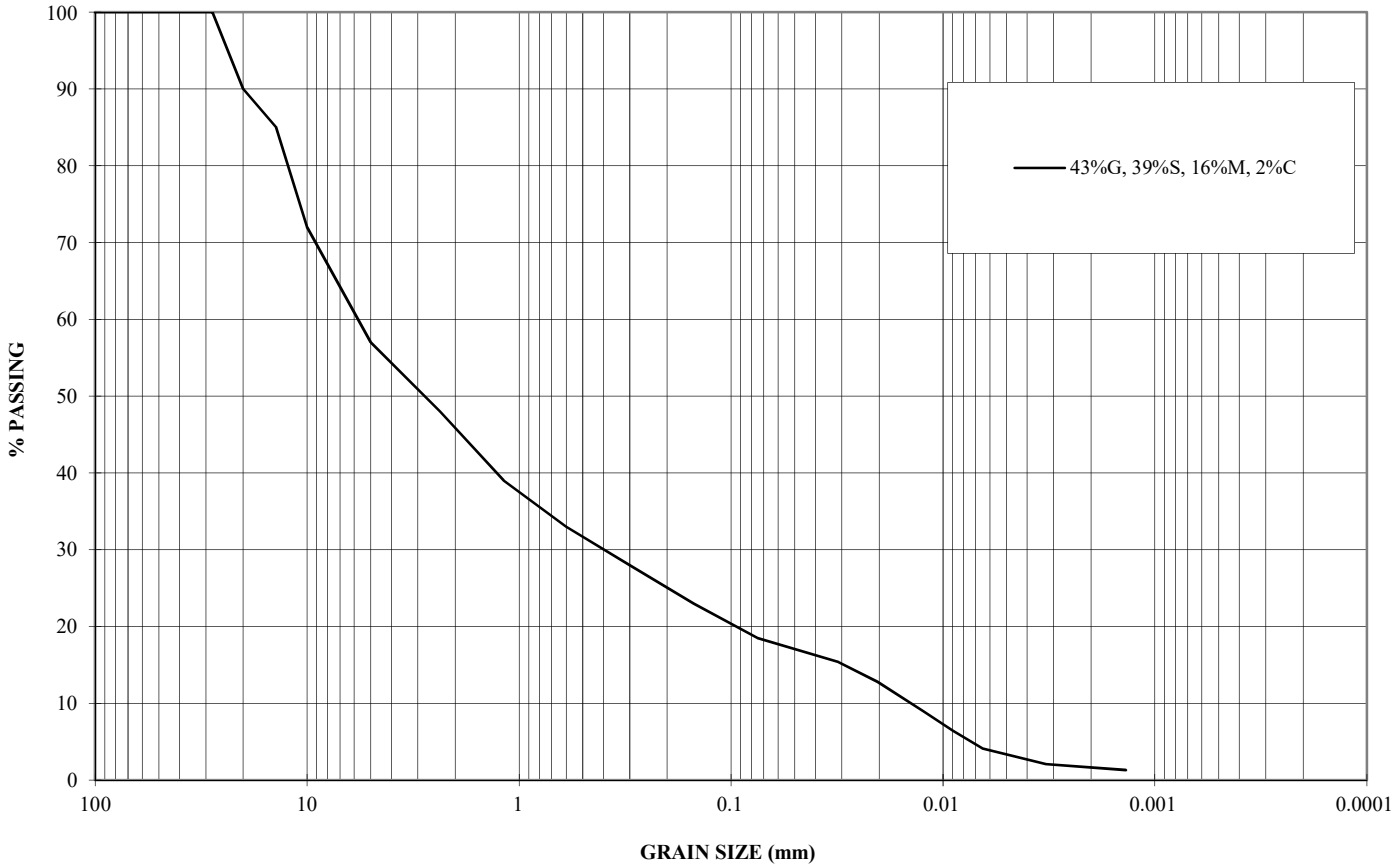
Moisture = 3.6%

Metric Sieve Analysis

	Sieve Size ASTM	Metric (mm)	% Passing
	4"	112	100
	3"	80	100
	2"	56	100
	1 1/2"	40	100
	1"	28	100
	3/4"	20	90
	1/2"	14	85
	3/8"	10	72
	No. 4	5	57
	No. 8	2.36	48
	No. 16	1.18	39
	No. 30	0.6	33
	No. 50	0.3	28
	No. 100	0.15	23
	No. 200	0.075	18.5
Hydrometer Analysis		0.0311	15.4
		0.0204	12.8
		0.0123	8.9
		0.0090	6.4
		0.0065	4.1
		0.0033	2.1
		0.0014	1.3

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-08A - SS2	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-09A**
Depth	**1.80m**
Sample No.	**SS3**
Date Received	
Sample Description	
Comments :	

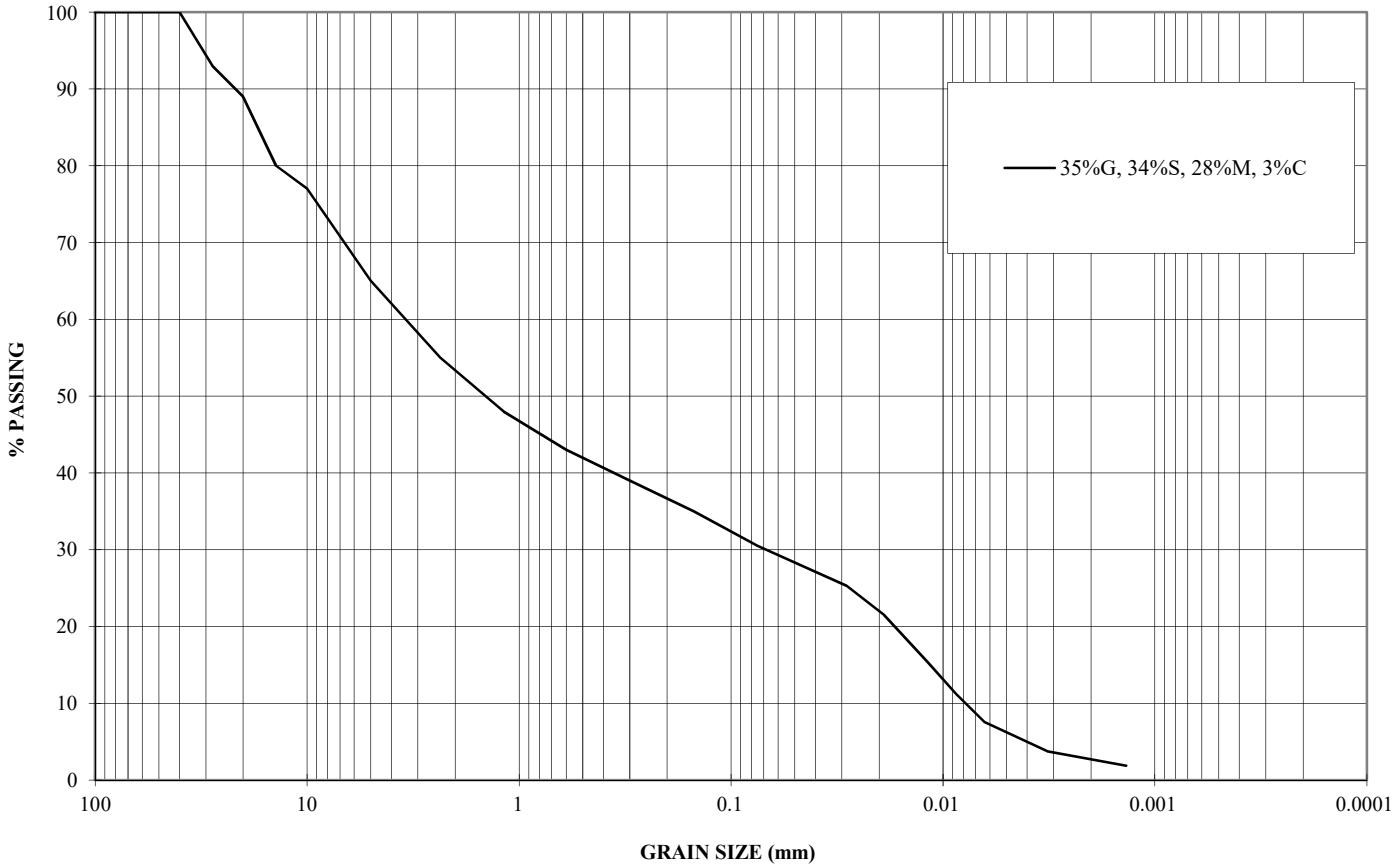
Moisture = 11.6%

Metric Sieve Analysis

	Sieve Size ASTM	Metric (mm)	% Passing
	4"	112	100
	3"	80	100
	2"	56	100
	1 1/2"	40	100
	1"	28	93
	3/4"	20	89
	1/2"	14	80
	3/8"	10	77
	No. 4	5	65
	No. 8	2.36	55
	No. 16	1.18	48
	No. 30	0.6	43
	No. 50	0.3	39
	No. 100	0.15	35
	No. 200	0.075	30.5
Hydrometer Analysis		0.0284	25.3
		0.0189	21.5
		0.0118	15.3
		0.0087	11.2
		0.0064	7.6
		0.0032	3.8
		0.0014	1.9

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-09A - SS3	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-09A**
Depth	**4.32m**
Sample No.	**SS5**
Date Received	
Sample Description	
Comments :	

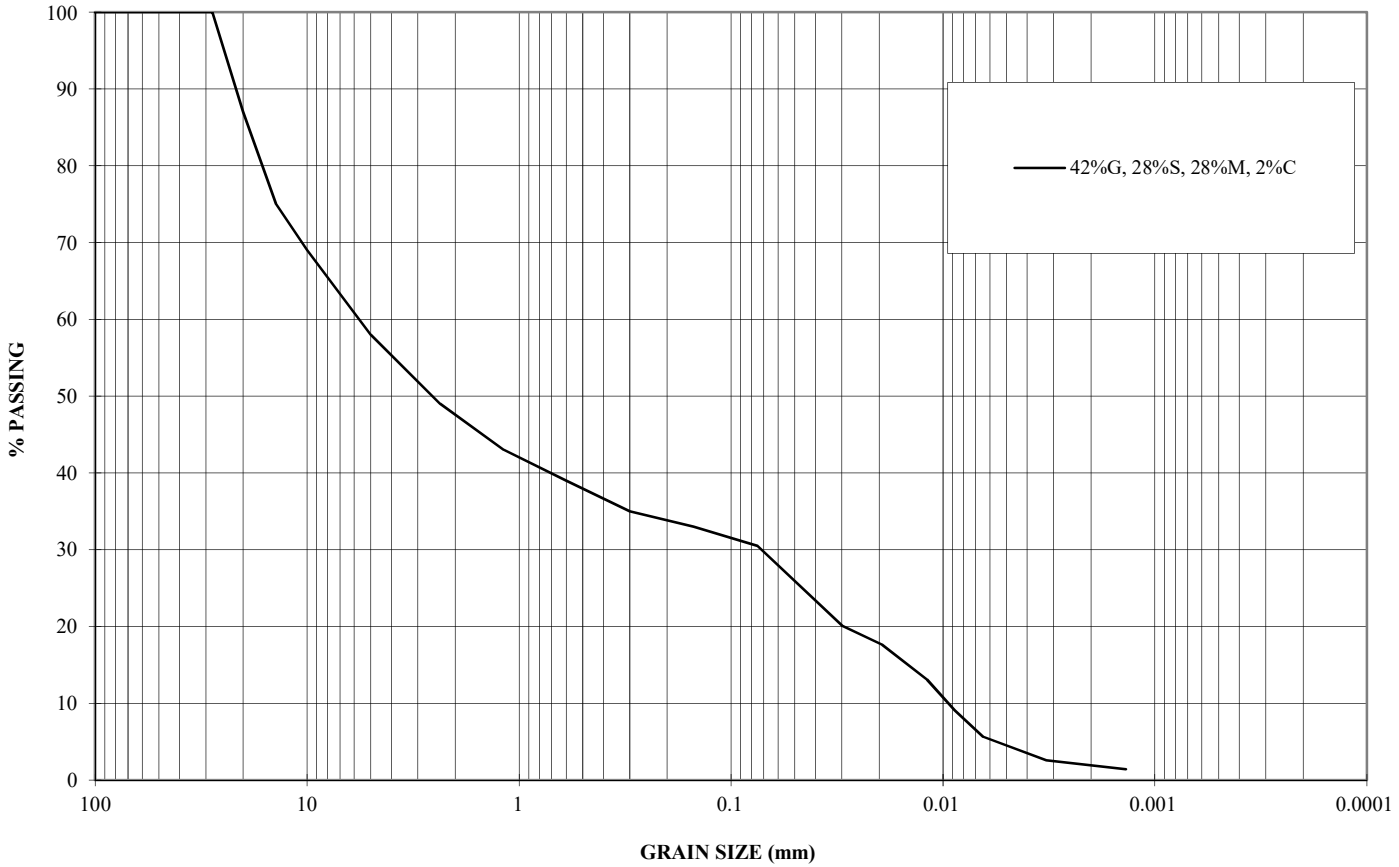
Moisture = 9.8%

Metric Sieve Analysis

	Sieve Size ASTM	Metric (mm)	% Passing
	4"	112	100
	3"	80	100
	2"	56	100
	1 1/2"	40	100
	1"	28	100
	3/4"	20	87
	1/2"	14	75
	3/8"	10	69
	No. 4	5	58
	No. 8	2.36	49
	No. 16	1.18	43
	No. 30	0.6	39
	No. 50	0.3	35
	No. 100	0.15	33
	No. 200	0.075	30.5
Hydrometer Analysis		0.0297	20.1
		0.0194	17.7
		0.0119	13.1
		0.0088	9.1
		0.0064	5.6
		0.0033	2.6
		0.0014	1.4

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-09A - SS5	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-10A**
Depth	**0.92m**
Sample No.	**SS2**
Date Received	
Sample Description	
Comments :	

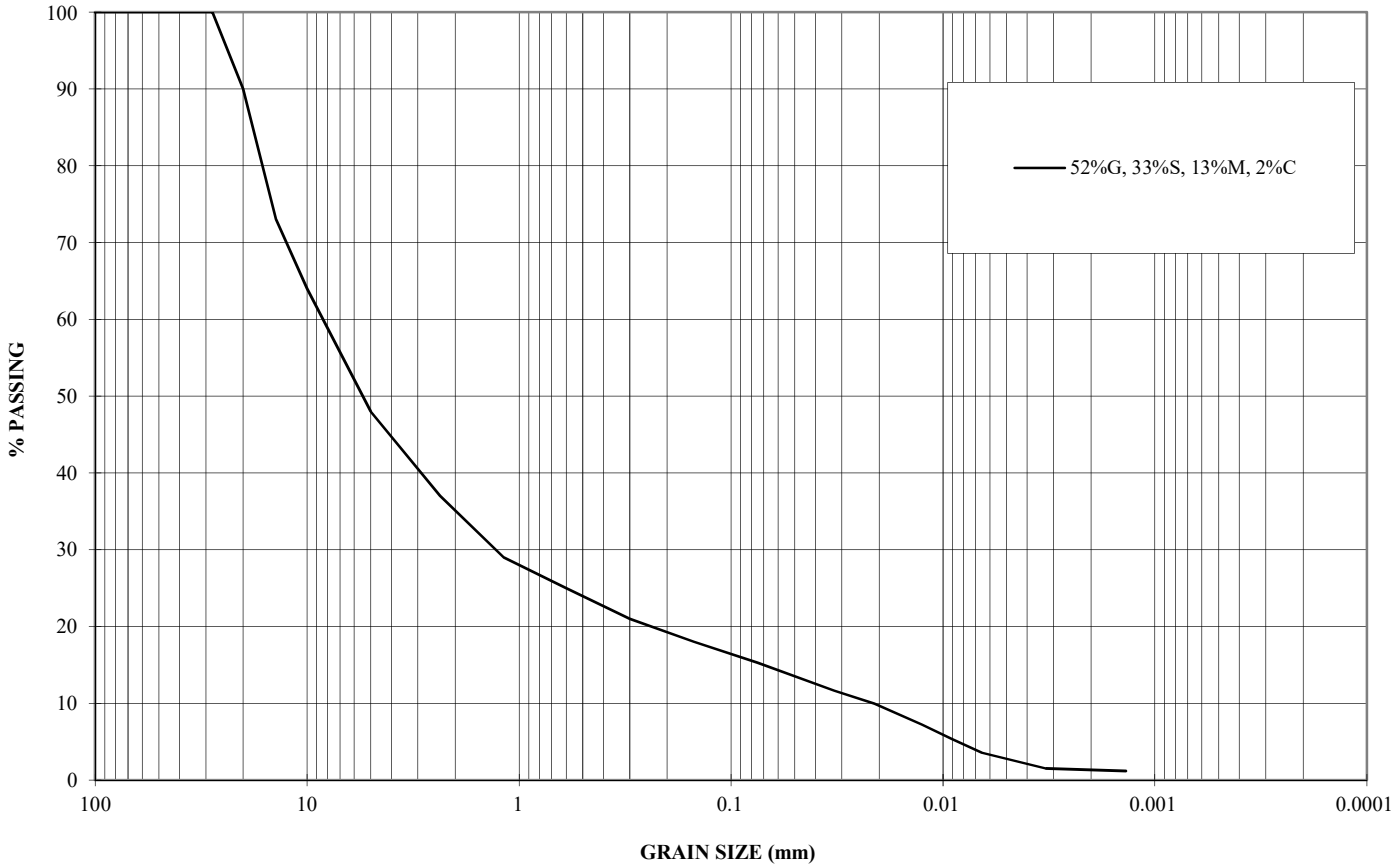
Moisture = 2.9%

Metric Sieve Analysis

	Sieve Size ASTM	Metric (mm)	% Passing
	4"	112	100
	3"	80	100
	2"	56	100
	1 1/2"	40	100
	1"	28	100
	3/4"	20	90
	1/2"	14	73
	3/8"	10	64
	No. 4	5	48
	No. 8	2.36	37
	No. 16	1.18	29
	No. 30	0.6	25
	No. 50	0.3	21
	No. 100	0.15	18
	No. 200	0.075	15.3
Hydrometer Analysis		0.0325	11.7
		0.0210	10.0
		0.0126	7.2
		0.0091	5.4
		0.0066	3.6
		0.0033	1.5
		0.0014	1.2

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-10A - SS2	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-13A**
Depth	**1.41m**
Sample No.	**SS3**
Date Received	
Sample Description	
Comments :	

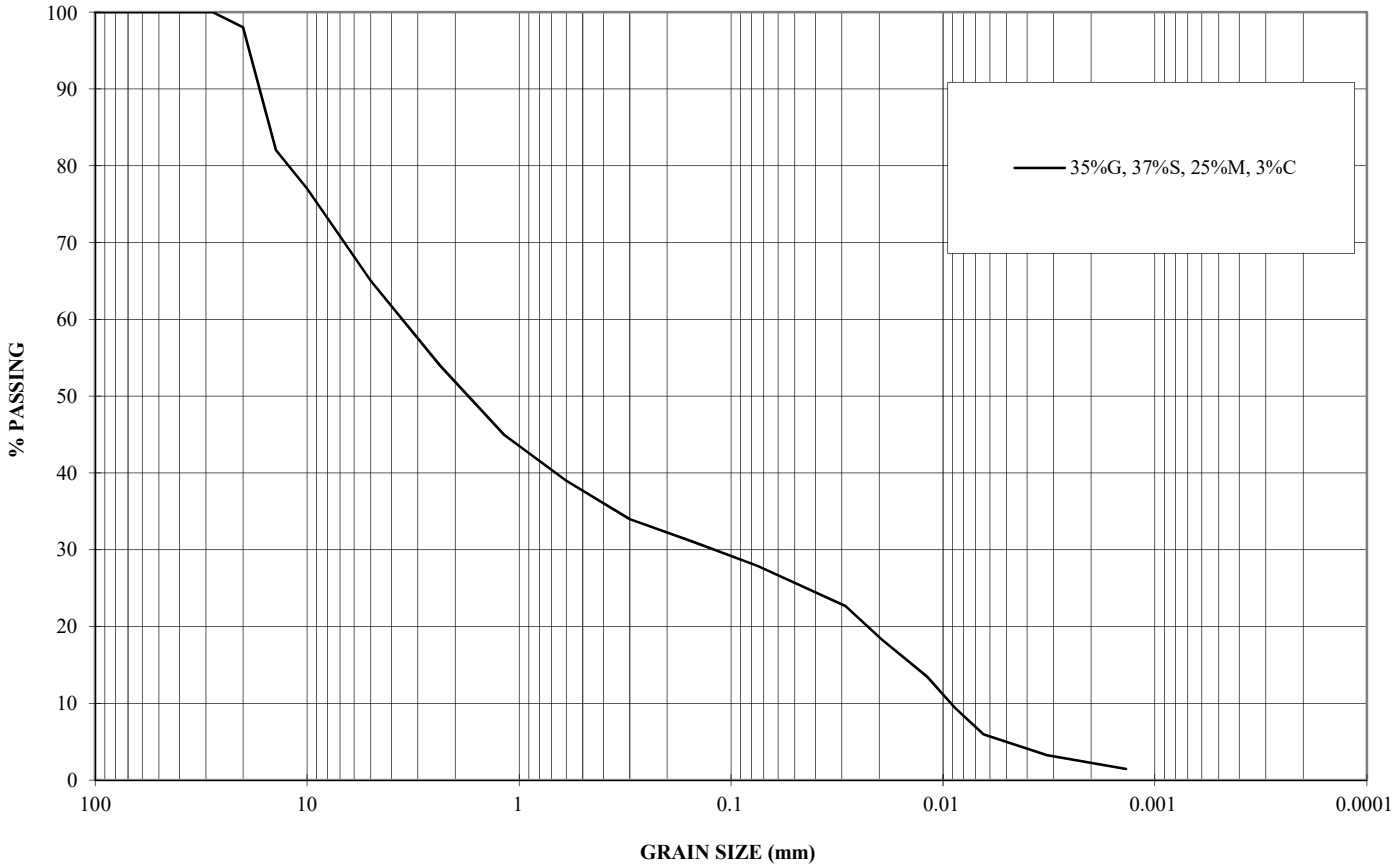
Moisture = 9.8%

Metric Sieve Analysis

	Sieve Size ASTM	Metric (mm)	% Passing
	4"	112	100
	3"	80	100
	2"	56	100
	1 1/2"	40	100
	1"	28	100
	3/4"	20	98
	1/2"	14	82
	3/8"	10	77
	No. 4	5	65
	No. 8	2.36	54
	No. 16	1.18	45
	No. 30	0.6	39
	No. 50	0.3	34
	No. 100	0.15	31
	No. 200	0.075	27.9
Hydrometer Analysis		0.0288	22.7
		0.0194	18.3
		0.0119	13.5
		0.0088	9.4
		0.0064	6.0
		0.0032	3.2
		0.0014	1.5

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-13A - SS3	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	27-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-14A**
Depth	**0.84m**
Sample No.	**SS2**
Date Received	
Sample Description	
Comments :	

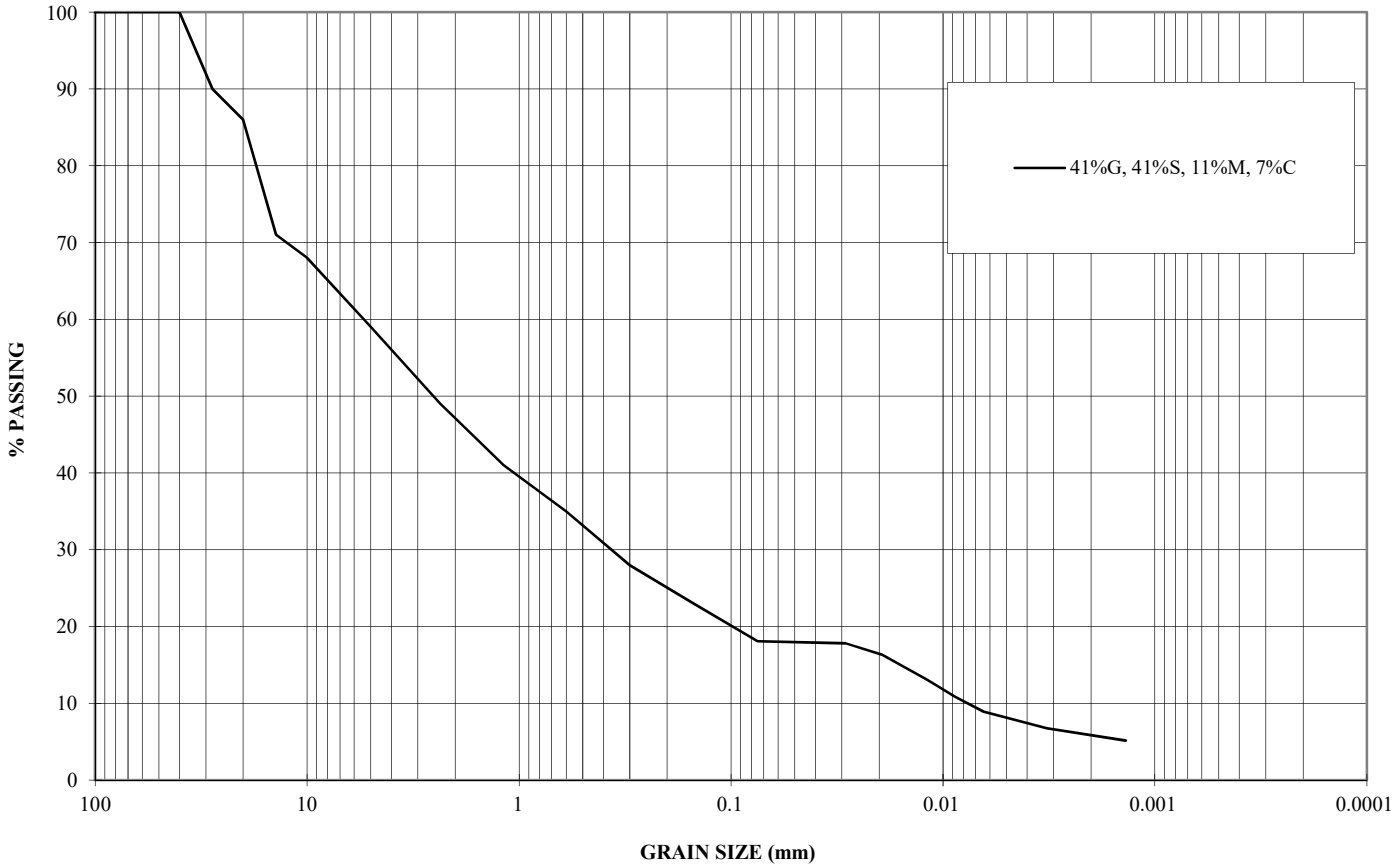
Moisture = 6.8%

Metric Sieve Analysis

Sieve Size ASTM	Metric (mm)	% Passing
4"	112	100
3"	80	100
2"	56	100
1 1/2"	40	100
1"	28	90
3/4"	20	86
1/2"	14	71
3/8"	10	68
No. 4	5	59
No. 8	2.36	49
No. 16	1.18	41
No. 30	0.6	35
No. 50	0.3	28
No. 100	0.15	23
No. 200	0.075	18.1
Hydrometer Analysis	0.0288	17.8
	0.0194	16.3
	0.0119	13.1
	0.0088	10.9
	0.0064	8.9
	0.0032	6.7
	0.0014	5.1

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-14A - SS2	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	28-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-14A**
Depth	**1.86m**
Sample No.	**SS3**
Date Received	
Sample Description	
Comments :	

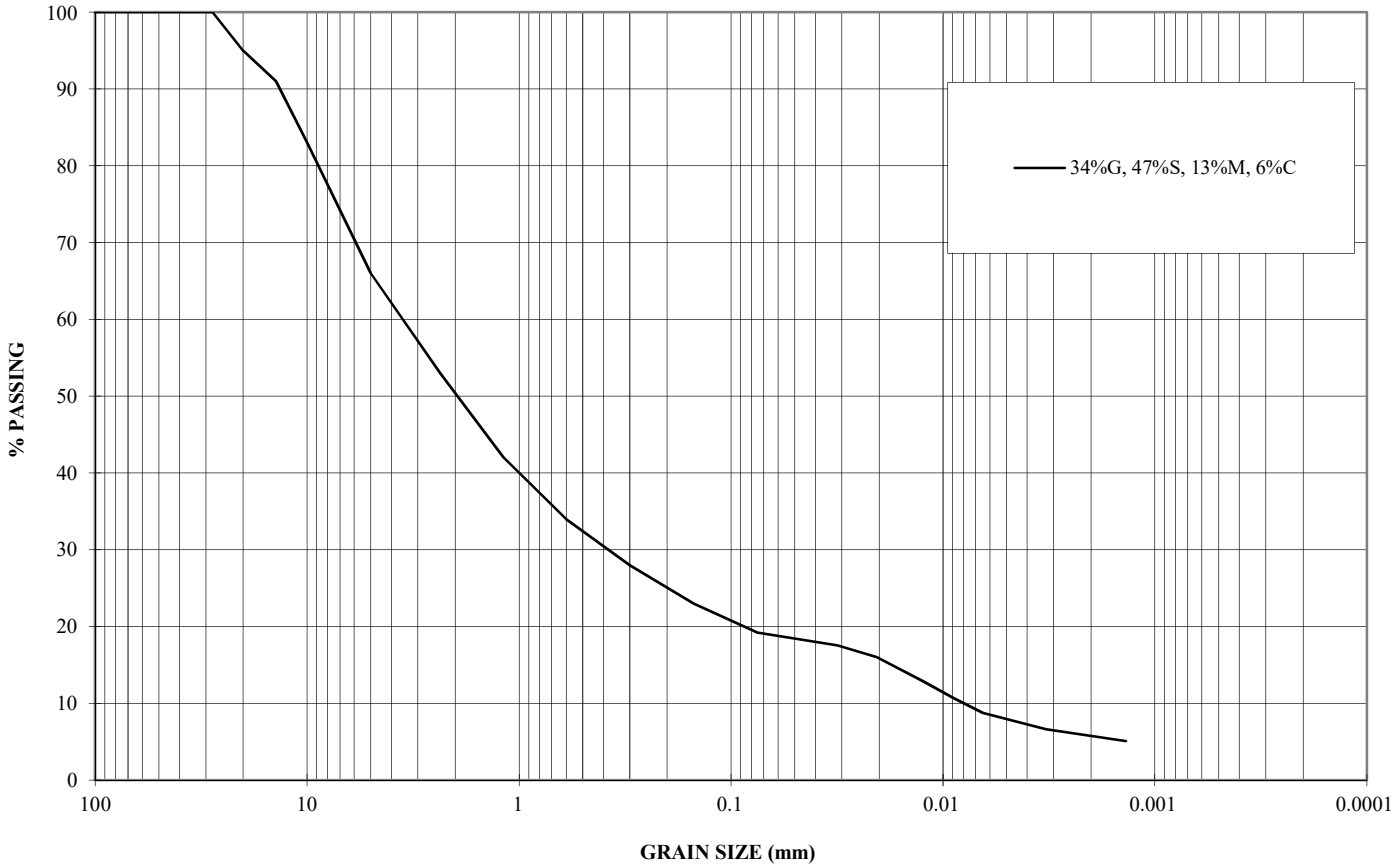
Moisture = 6.4%

Metric Sieve Analysis

	Sieve Size ASTM	Metric (mm)	% Passing
	4"	112	100
	3"	80	100
	2"	56	100
	1 1/2"	40	100
	1"	28	100
	3/4"	20	95
	1/2"	14	91
	3/8"	10	83
	No. 4	5	66
	No. 8	2.36	53
	No. 16	1.18	42
	No. 30	0.6	34
	No. 50	0.3	28
	No. 100	0.15	23
	No. 200	0.075	19.2
Hydrometer Analysis		0.0315	17.5
		0.0207	16.1
		0.0124	12.9
		0.0089	10.7
		0.0065	8.8
		0.0033	6.6
		0.0014	5.1

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-14A - SS3	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	28-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-16A**
Depth	**0.31m**
Sample No.	**SS1**
Date Received	
Sample Description	
Comments :	

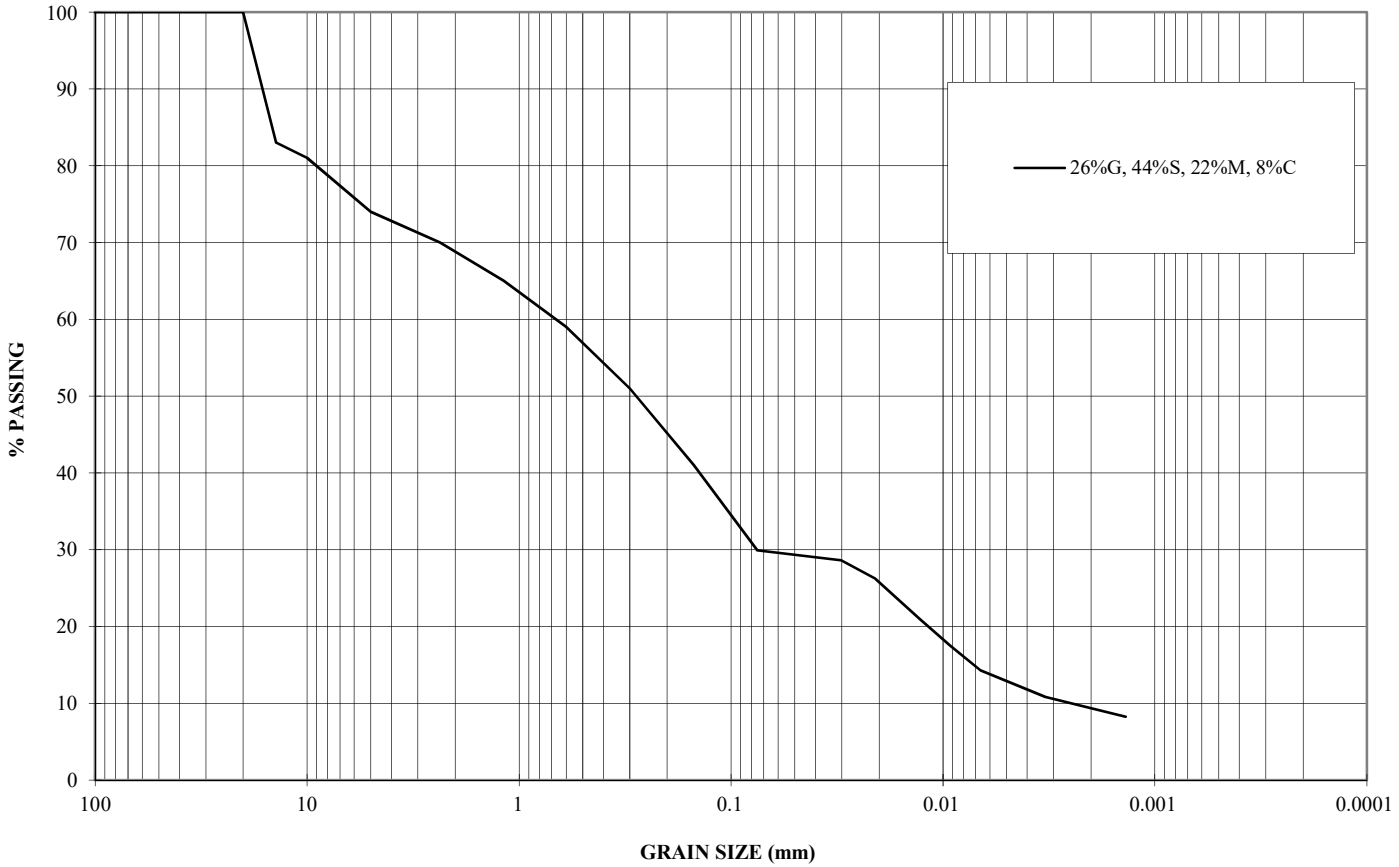
Moisture = 23.9%

Metric Sieve Analysis

Sieve Size ASTM	Metric (mm)	% Passing
4"	112	100
3"	80	100
2"	56	100
1 1/2"	40	100
1"	28	100
3/4"	20	100
1/2"	14	83
3/8"	10	81
No. 4	5	74
No. 8	2.36	70
No. 16	1.18	65
No. 30	0.6	59
No. 50	0.3	51
No. 100	0.15	41
No. 200	0.075	29.9
Hydrometer Analysis	0.0303	28.6
	0.0209	26.2
	0.0129	21.0
	0.0092	17.5
	0.0067	14.3
	0.0033	10.8
	0.0014	8.3

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-16A - SS1	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	28-Sep-18

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

Client	**Golder Associates (Golder Project No.1895674)**
Project	**Atlantic Gold Hydrogeological Investigation**
Borehole	**FMS-HG18-16A**
Depth	**1.64m**
Sample No.	**SS3**
Date Received	
Sample Description	
Comments :	**Non-Plastic**

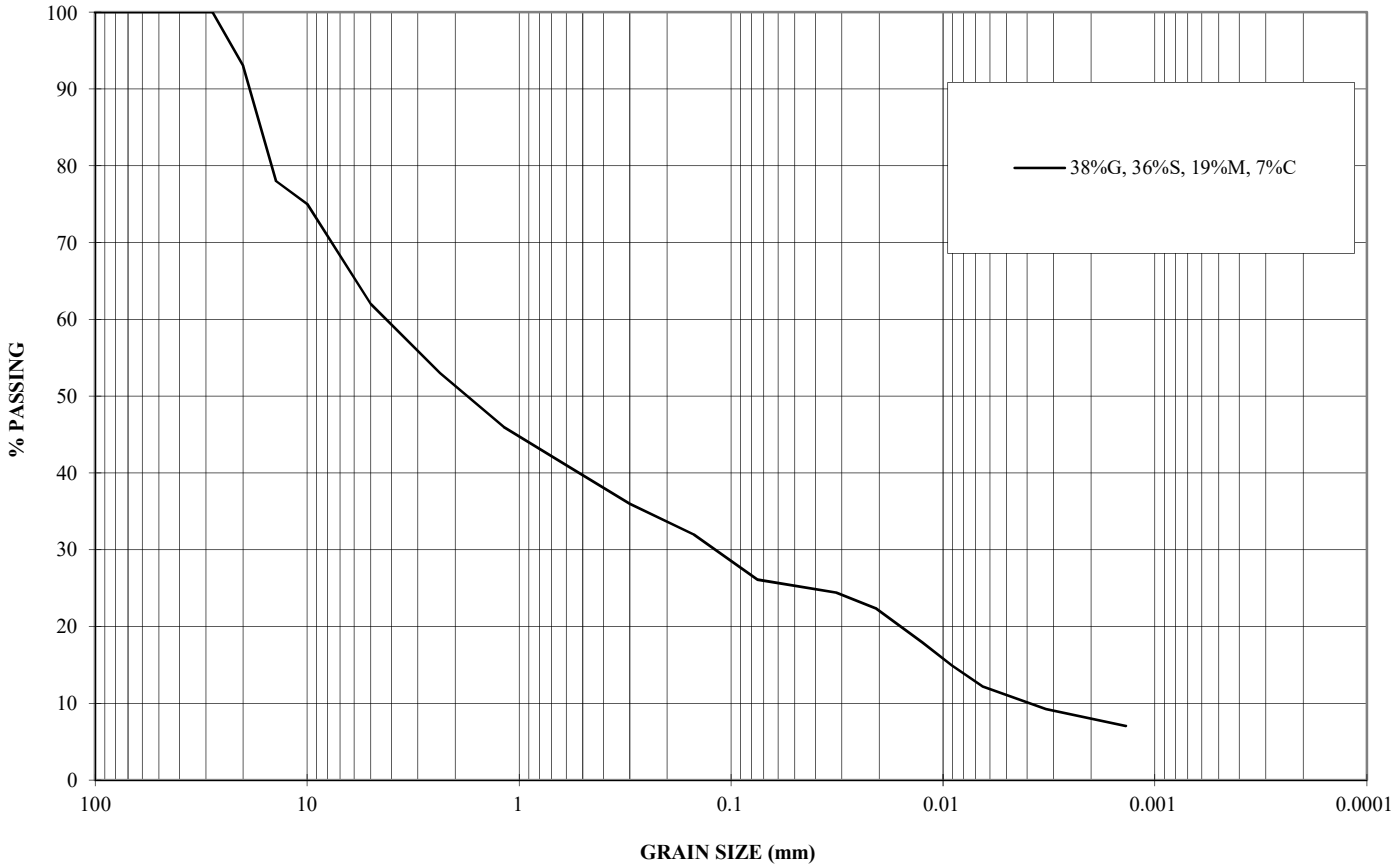
Moisture = 9.1%

Metric Sieve Analysis

	Sieve Size ASTM	Metric (mm)	% Passing
	4"	112	100
	3"	80	100
	2"	56	100
	1 1/2"	40	100
	1"	28	100
	3/4"	20	93
	1/2"	14	78
	3/8"	10	75
	No. 4	5	62
	No. 8	2.36	53
	No. 16	1.18	46
	No. 30	0.6	41
	No. 50	0.3	36
	No. 100	0.15	32
	No. 200	0.075	26.1
Hydrometer Analysis		0.0319	24.4
		0.0207	22.4
		0.0125	17.9
		0.0090	14.9
		0.0065	12.2
		0.0033	9.2
		0.0014	7.1

Client:	Golder Associates (Golder Project No.1895674)	Project:	Atlantic Gold Hydrogeological Investigation
Sample:	FMS-HG18-16A - SS3	Date Sample Rec'd.:	
Sample Taken By:	Client	Report Date:	28-Sep-18

GRAIN SIZE DISTRIBUTION



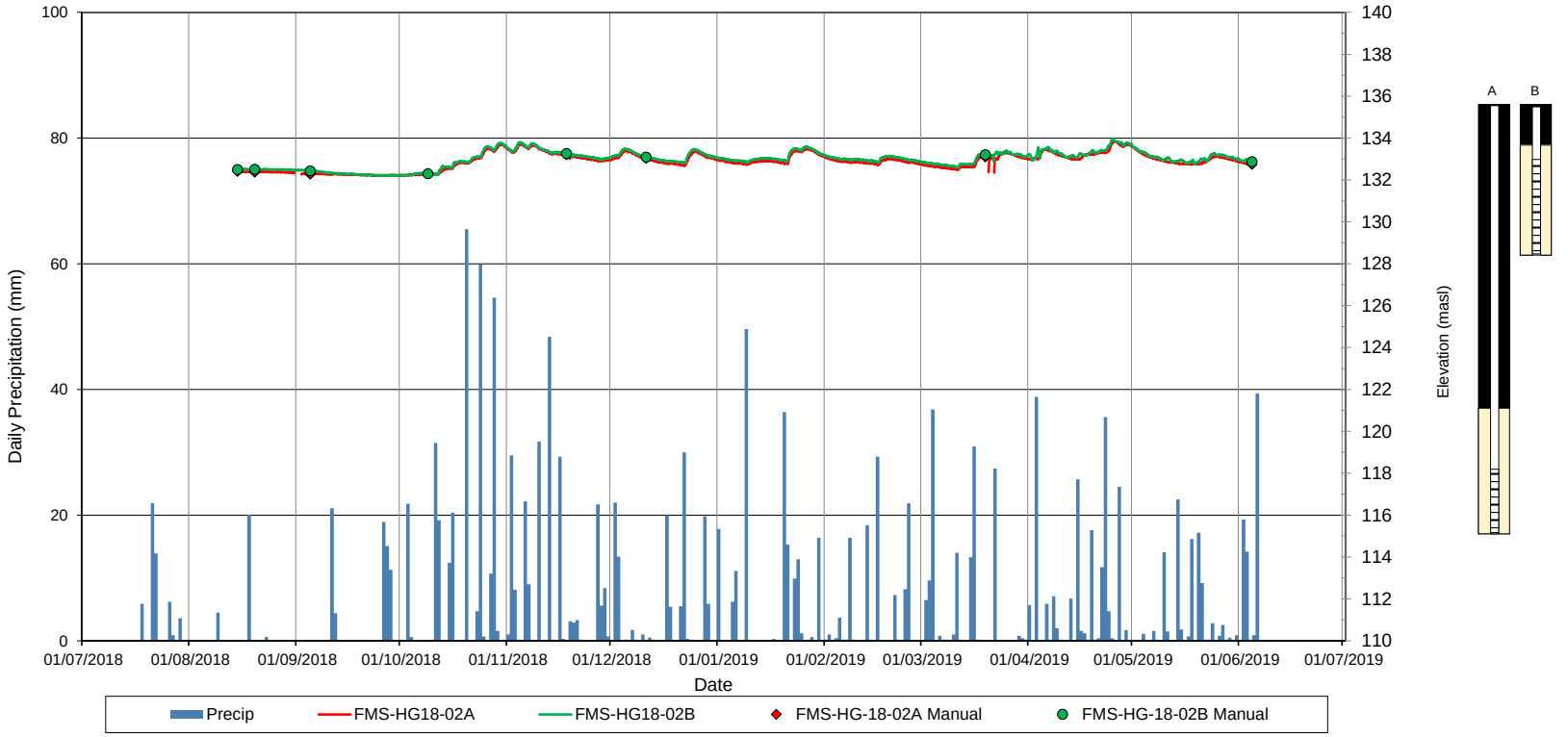
GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

APPENDIX D

Groundwater Level Hydrographs

HYDROGRAPH OF MONITORING WELL NEST FMS-HG18-02A/B
GROUNDWATER ELEVATIONS

FIGURE 1



DATE: June 2019

PROJECT: 1895674

Note: Precipitation data from Malay Falls, NS Station, Approximately 18 km away

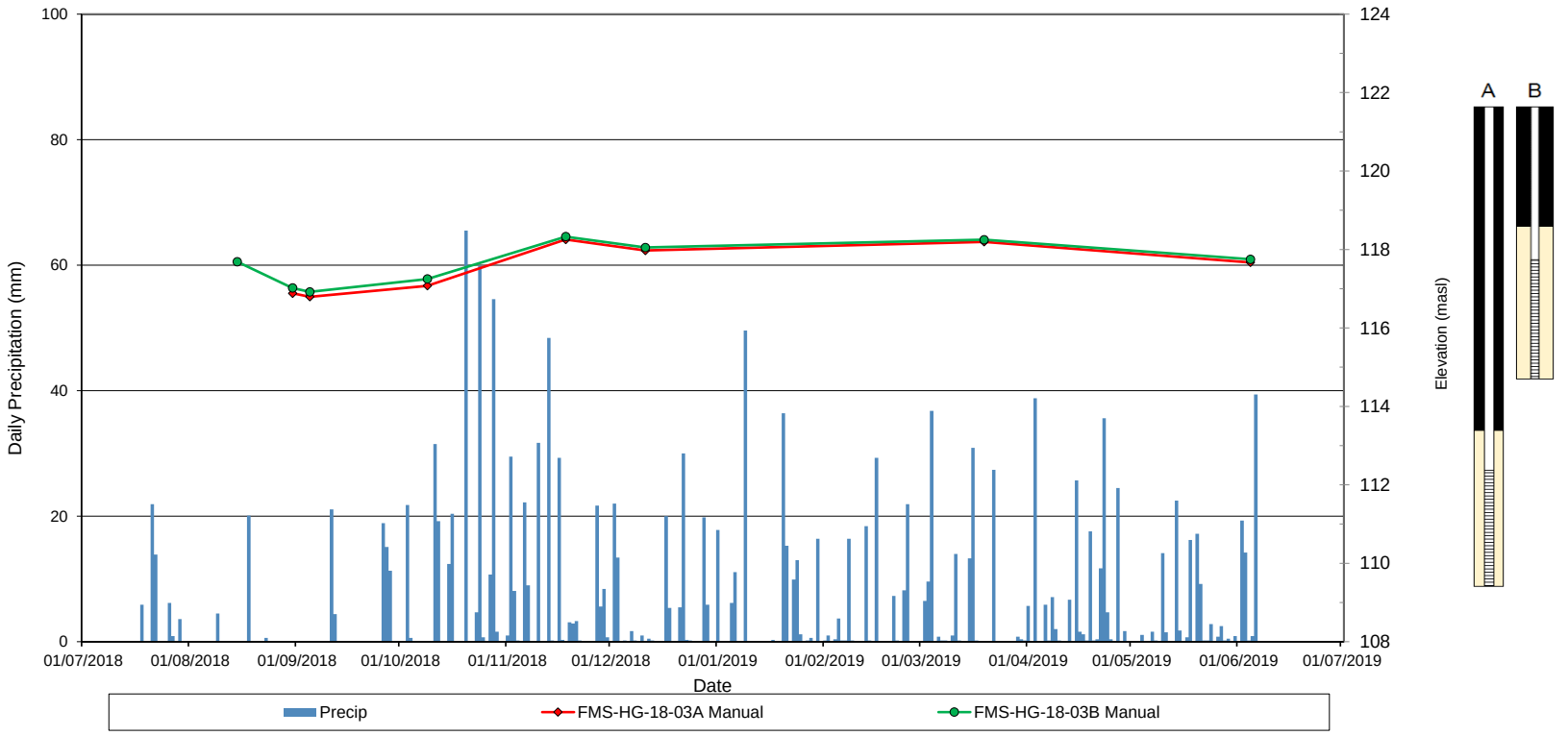
GOLDER

Prepared: CM

Checked: GM

HYDROGRAPH OF MONITORING WELL NEST FMS-HG18-03A/B
GROUNDWATER ELEVATIONS

FIGURE 2



DATE: June 2019

PROJECT: 1895674

Note: Precipitation data from Malay Falls, NS Station, Approximately 18 km away

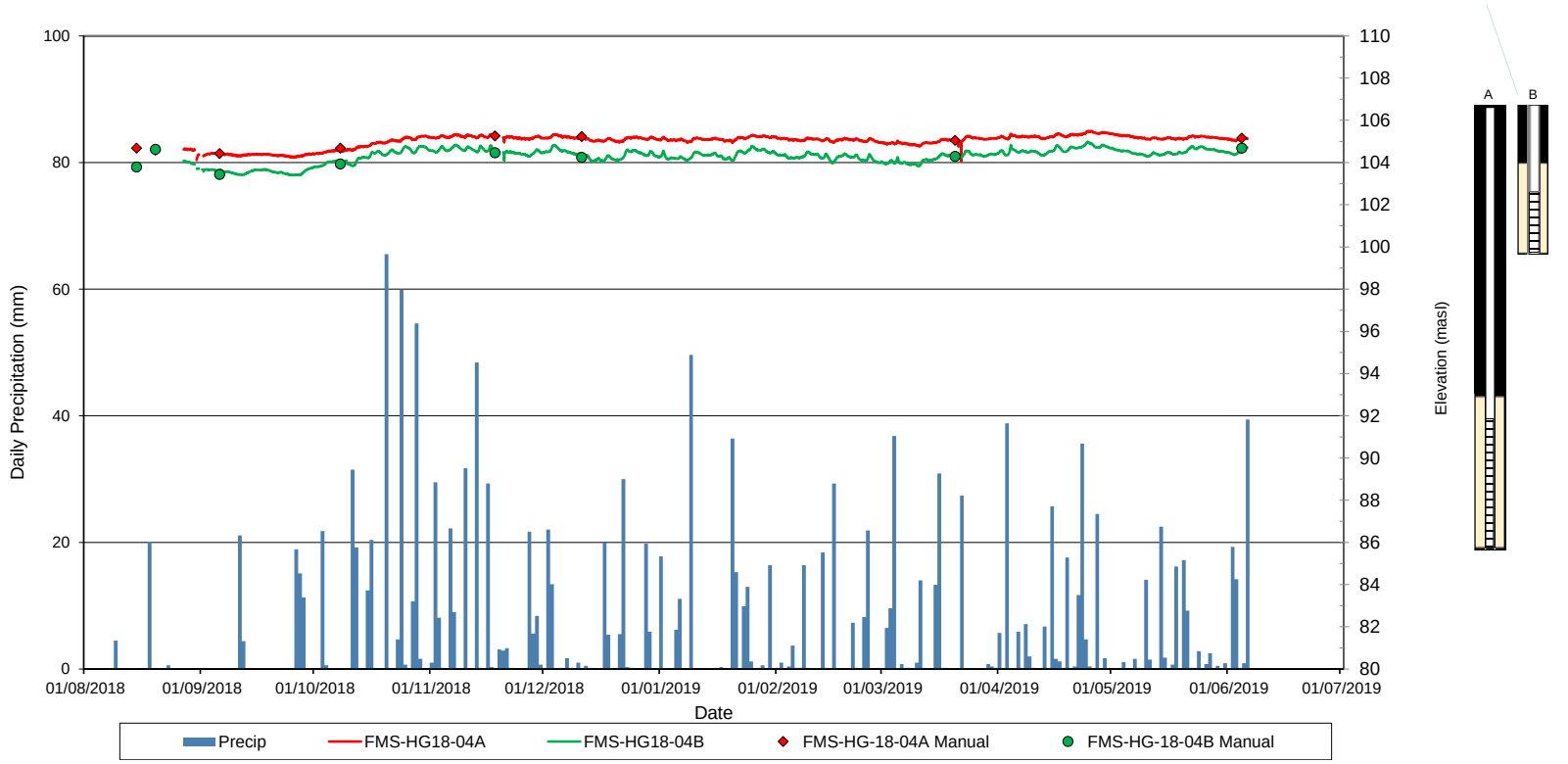
GOLDER

Prepared: CM

Checked: GM

HYDROGRAPH OF MONITORING WELL NEST FMS-HG18-04A/B
GROUNDWATER ELEVATIONS

FIGURE 3



DATE: June 2019

PROJECT: 1895674

Note: Precipitation data from Malay Falls, NS Station, Approximately 18 km away

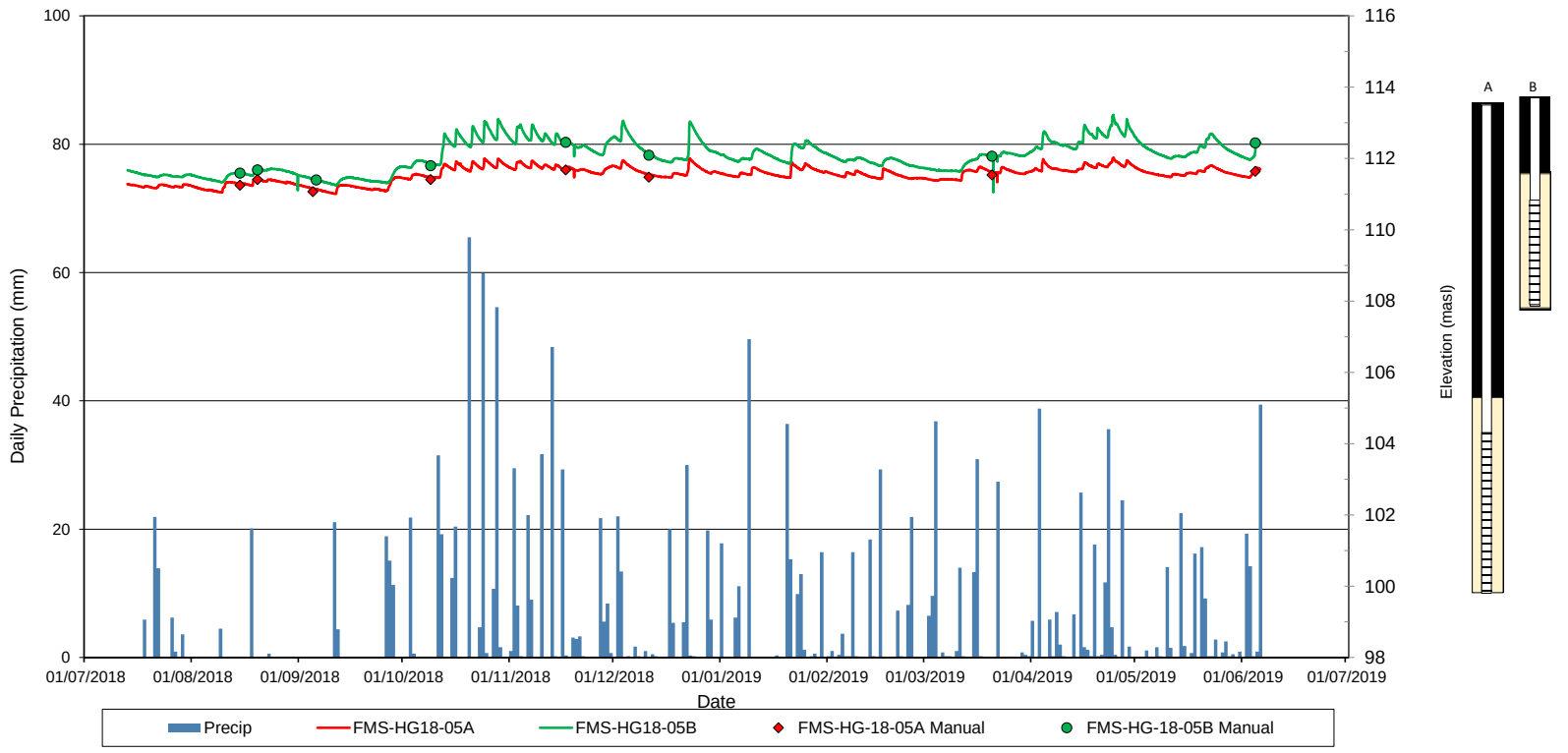
GOLDER

Prepared: CM

Checked: GM

HYDROGRAPH OF MONITORING WELL NEST FMS-HG18-05A/B
GROUNDWATER ELEVATIONS

FIGURE 4



DATE: June 2019

PROJECT: 1895674

Note: Precipitation data from Malay Falls, NS Station, Approximately 18 km away

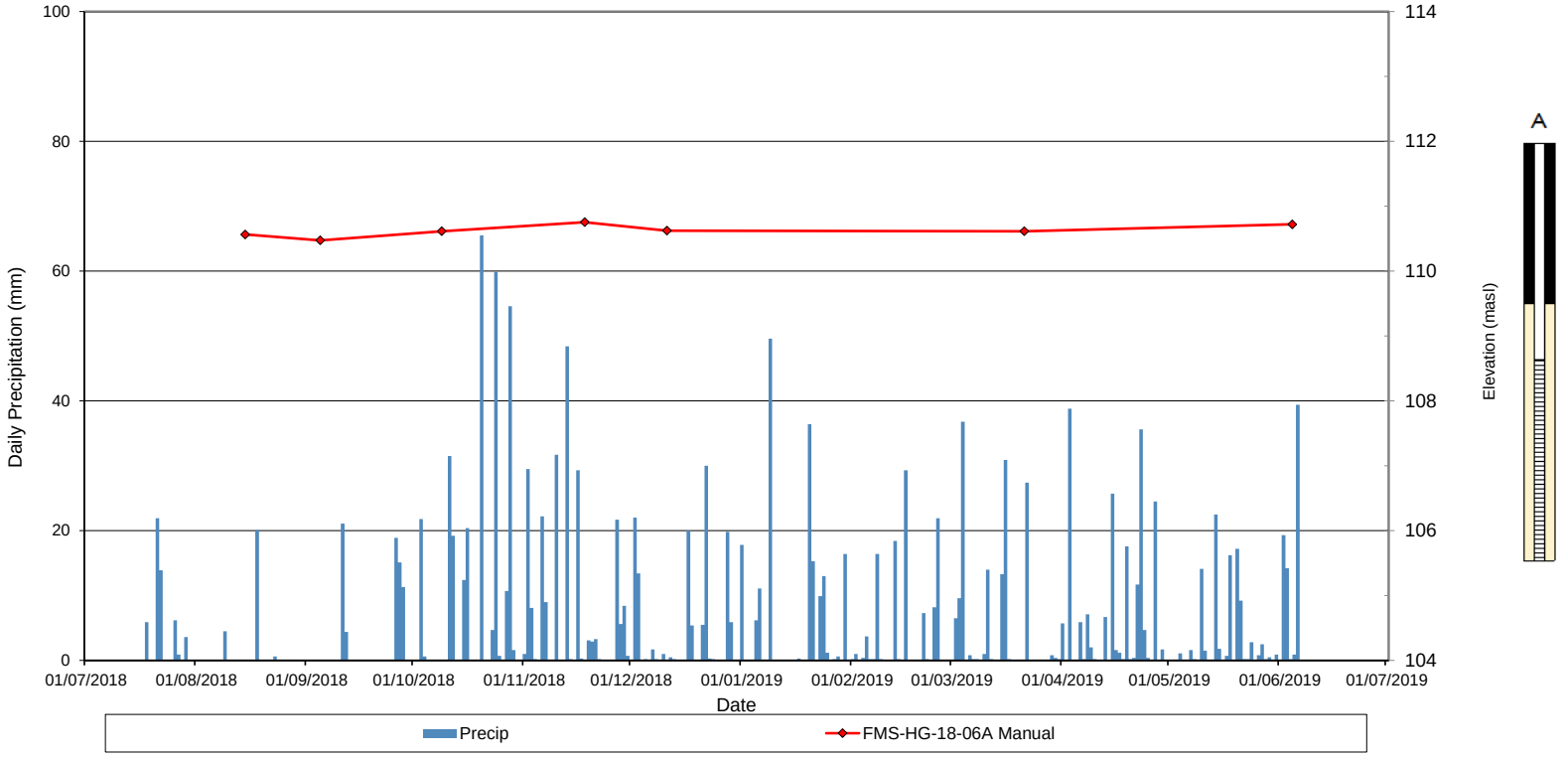
GOLDER

Prepared: CM

Checked: GM

HYDROGRAPH OF MONITORING WELL NEST FMS-HG18-06A
GROUNDWATER ELEVATIONS

FIGURE 5



DATE: June 2019

PROJECT: 1895674

Note: Precipitation data from Malay Falls, NS Station, Approximately 18 km away

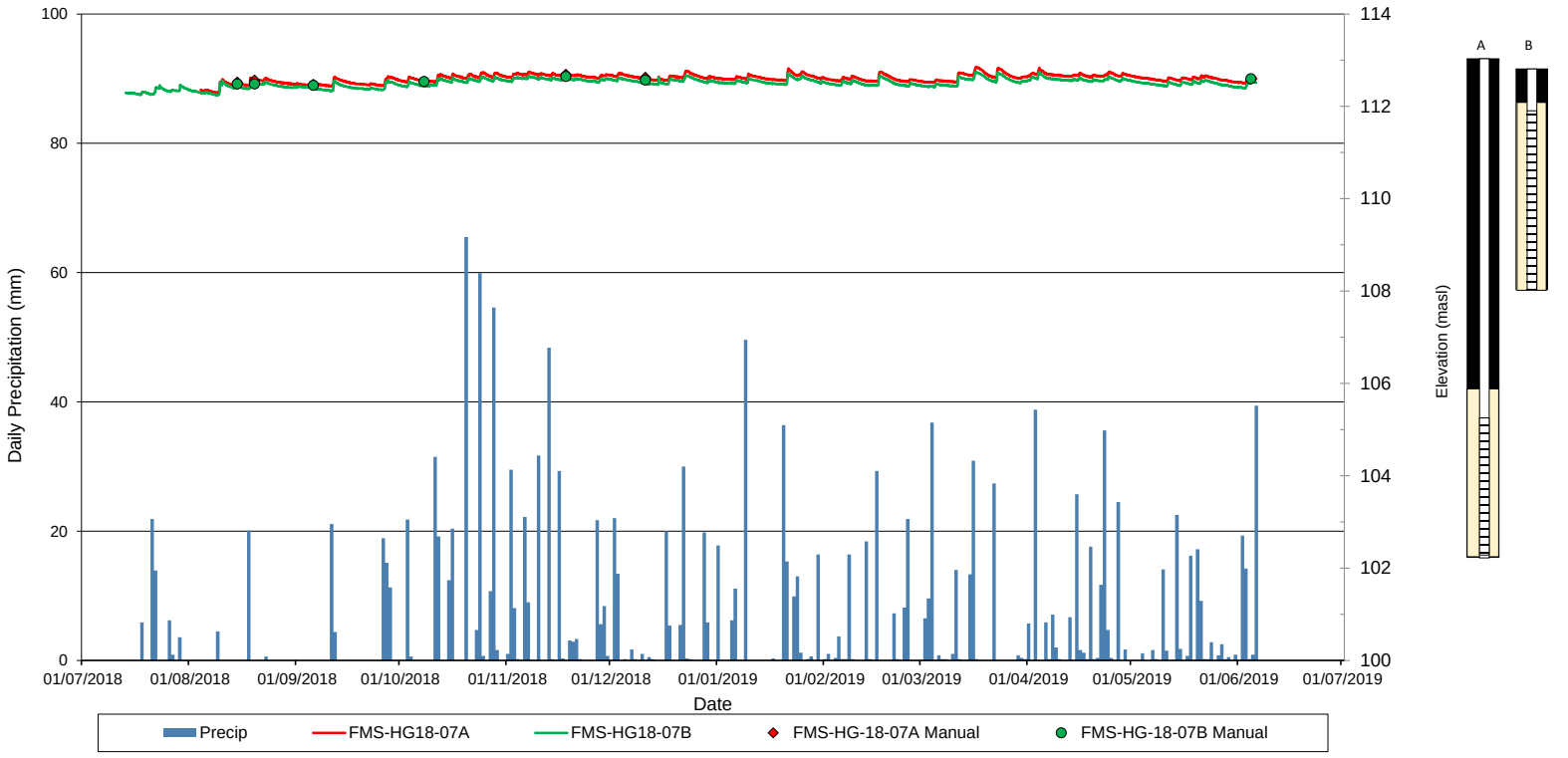
GOLDER

Prepared: CM

Checked: GM

HYDROGRAPH OF MONITORING WELL NEST FMS-HG18-07A/B
GROUNDWATER ELEVATIONS

FIGURE 6



DATE: June 2019

PROJECT: 1895674

Note: Precipitation data from Malay Falls, NS Station, Approximately 18 km away

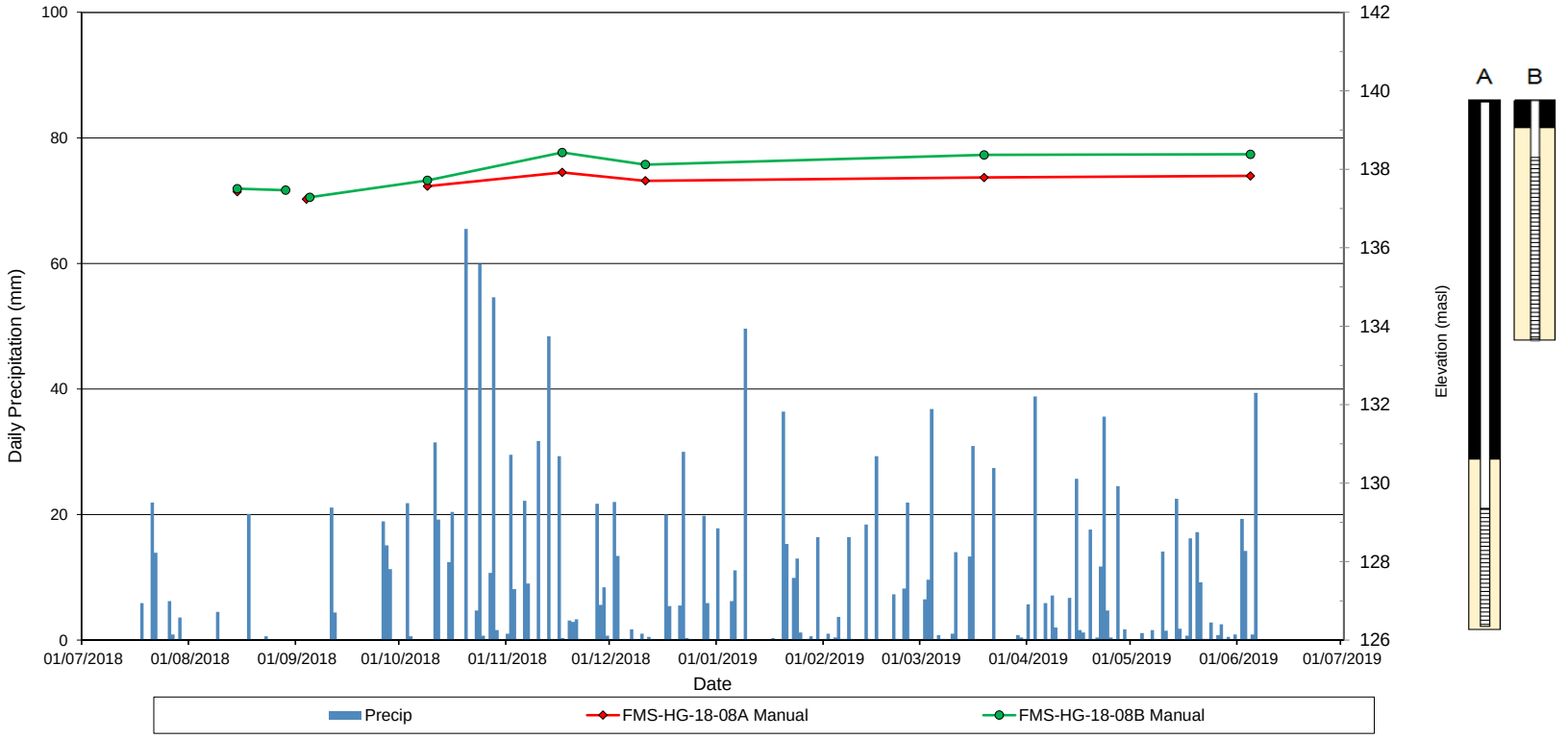
GOLDER

Prepared: CM

Checked: GM

HYDROGRAPH OF MONITORING WELL NEST FMS-HG18-08A/B
GROUNDWATER ELEVATIONS

FIGURE 7



DATE: June 2019

PROJECT: 1895674

Note: Precipitation data from Malay Falls, NS Station, Approximately 18 km away

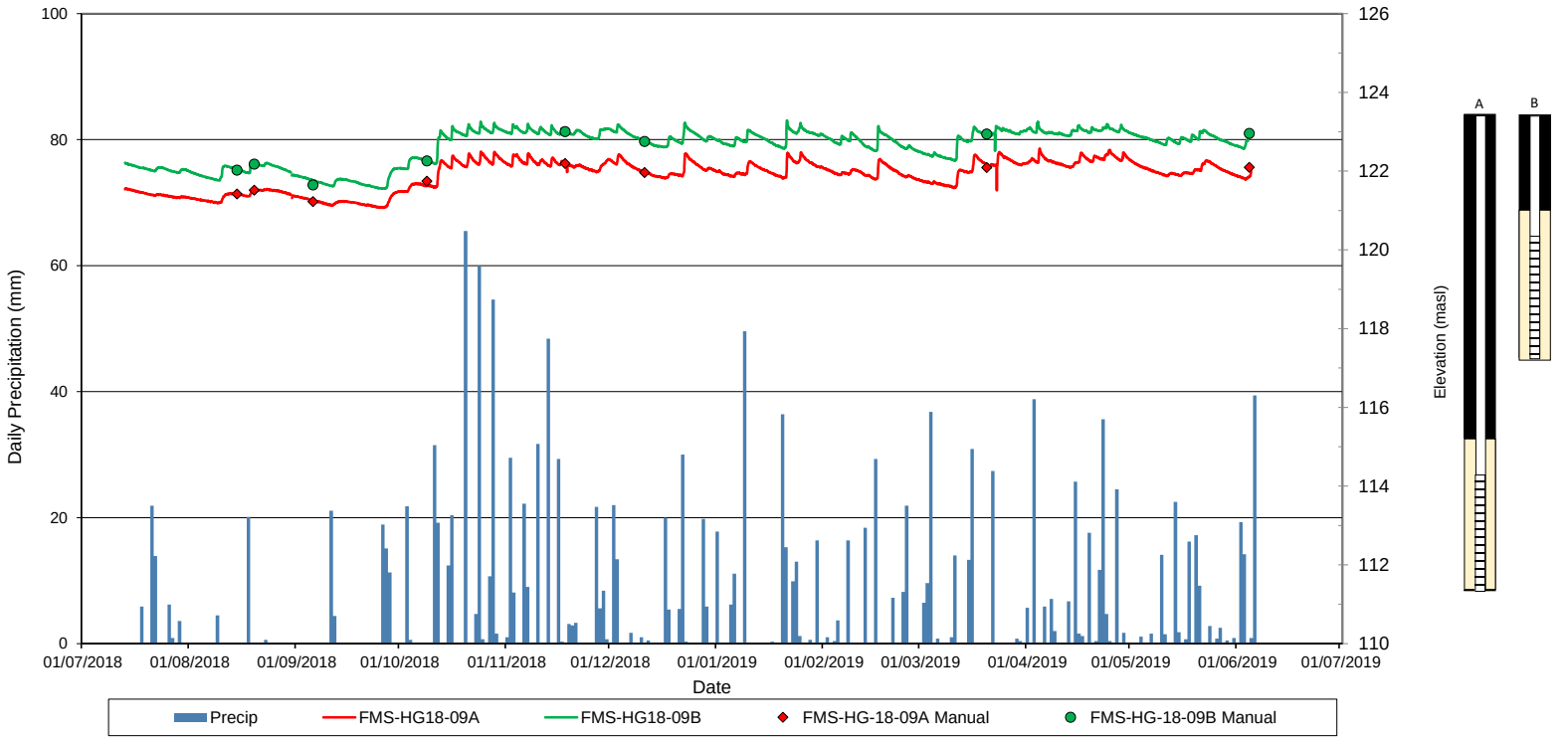
GOLDER

Prepared: CM

Checked: GM

HYDROGRAPH OF MONITORING WELL NEST FMS-HG18-09A/B
GROUNDWATER ELEVATIONS

FIGURE 8



DATE: June 2019

PROJECT: 1895674

Note: Precipitation data from Malay Falls, NS Station, Approximately 18 km away

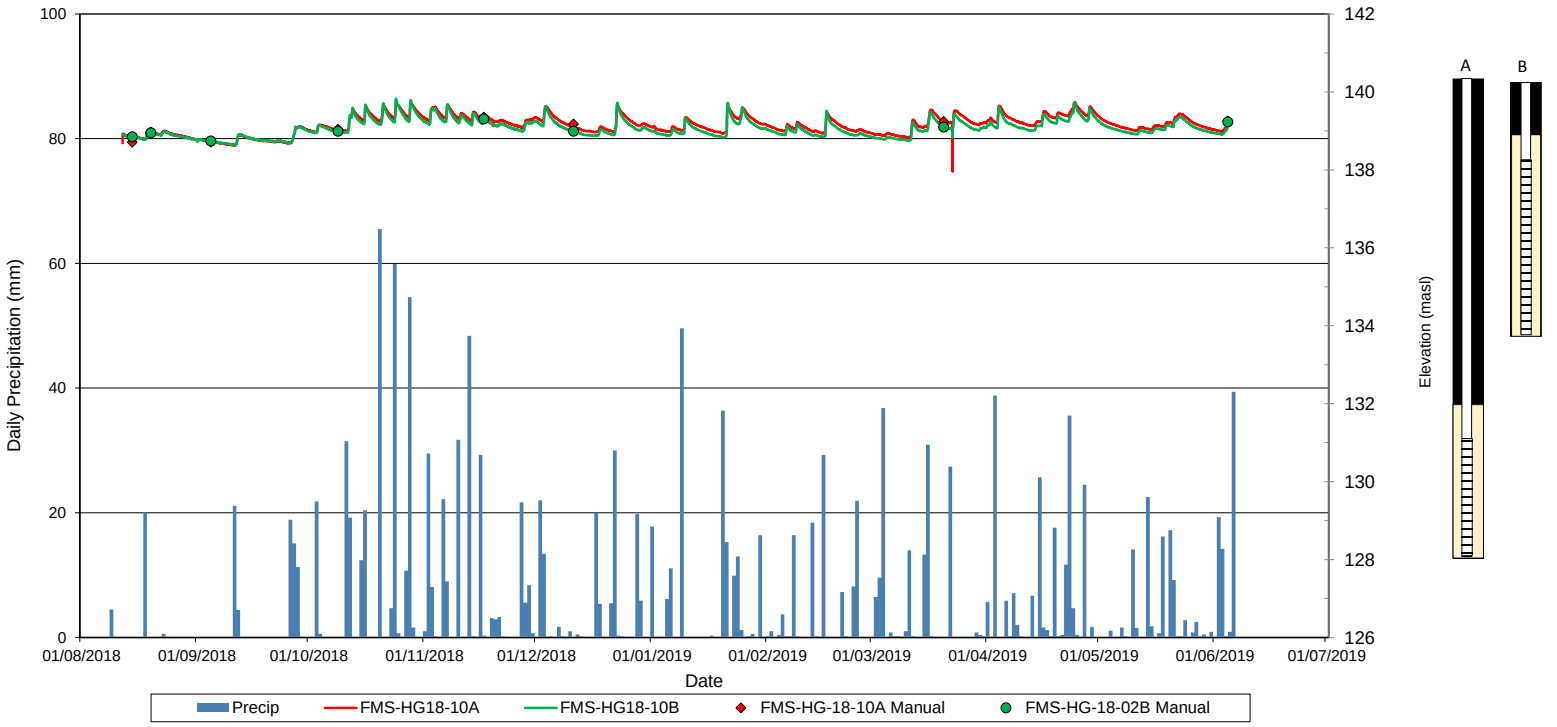
GOLDER

Prepared: CM

Checked: GM

HYDROGRAPH OF MONITORING WELL NEST FMS-HG18-10A/B
GROUNDWATER ELEVATIONS

FIGURE 9



DATE: June 2019

PROJECT: 1895674

Note: Precipitation data from Malay Falls, NS Station, Approximately 18 km away

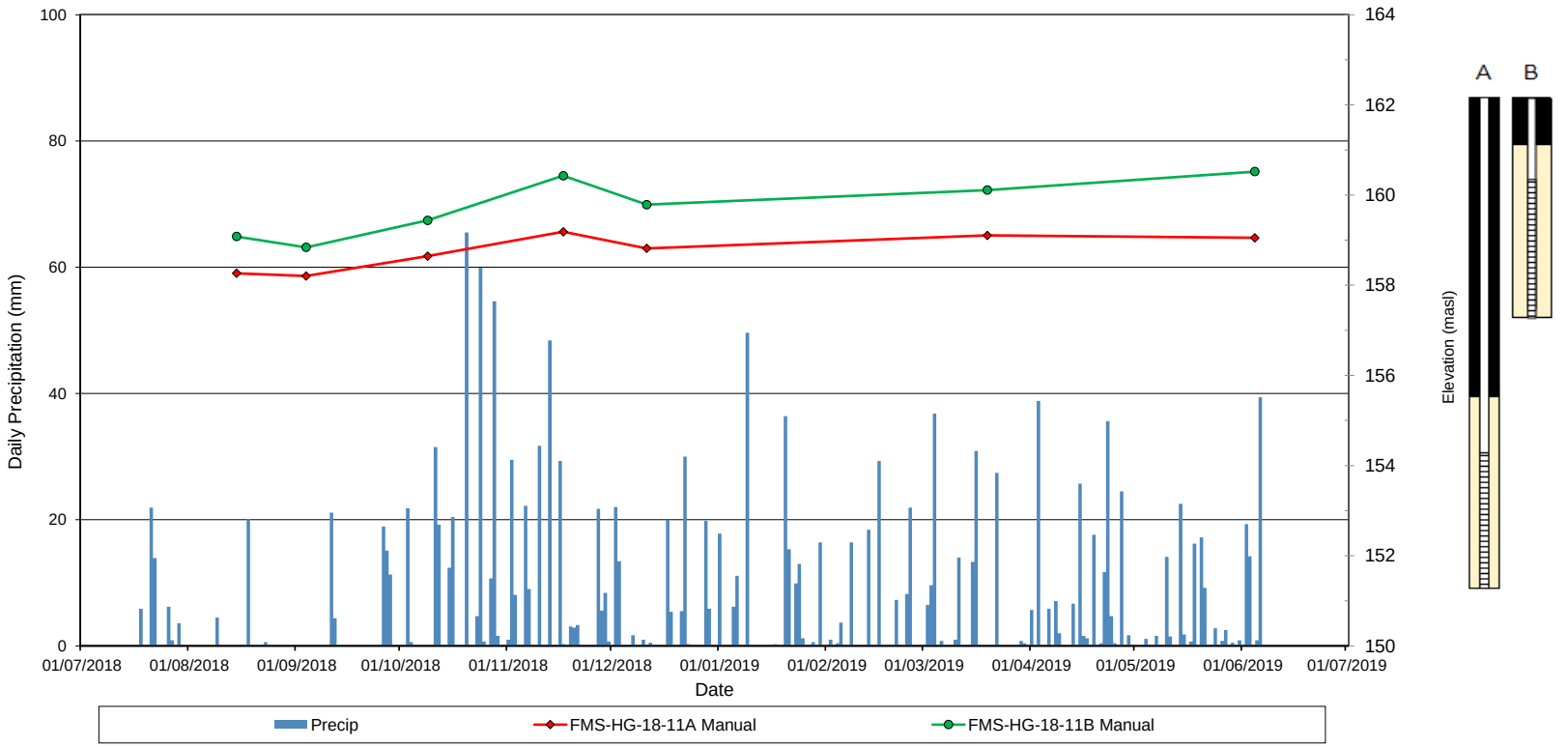
GOLDER

Prepared: CM

Checked: GM

HYDROGRAPH OF MONITORING WELL NEST FMS-HG18-11A/B
GROUNDWATER ELEVATIONS

FIGURE 10



DATE: June 2019

PROJECT: 1895674

Note: Precipitation data from Malay Falls, NS Station, Approximately 18 km away

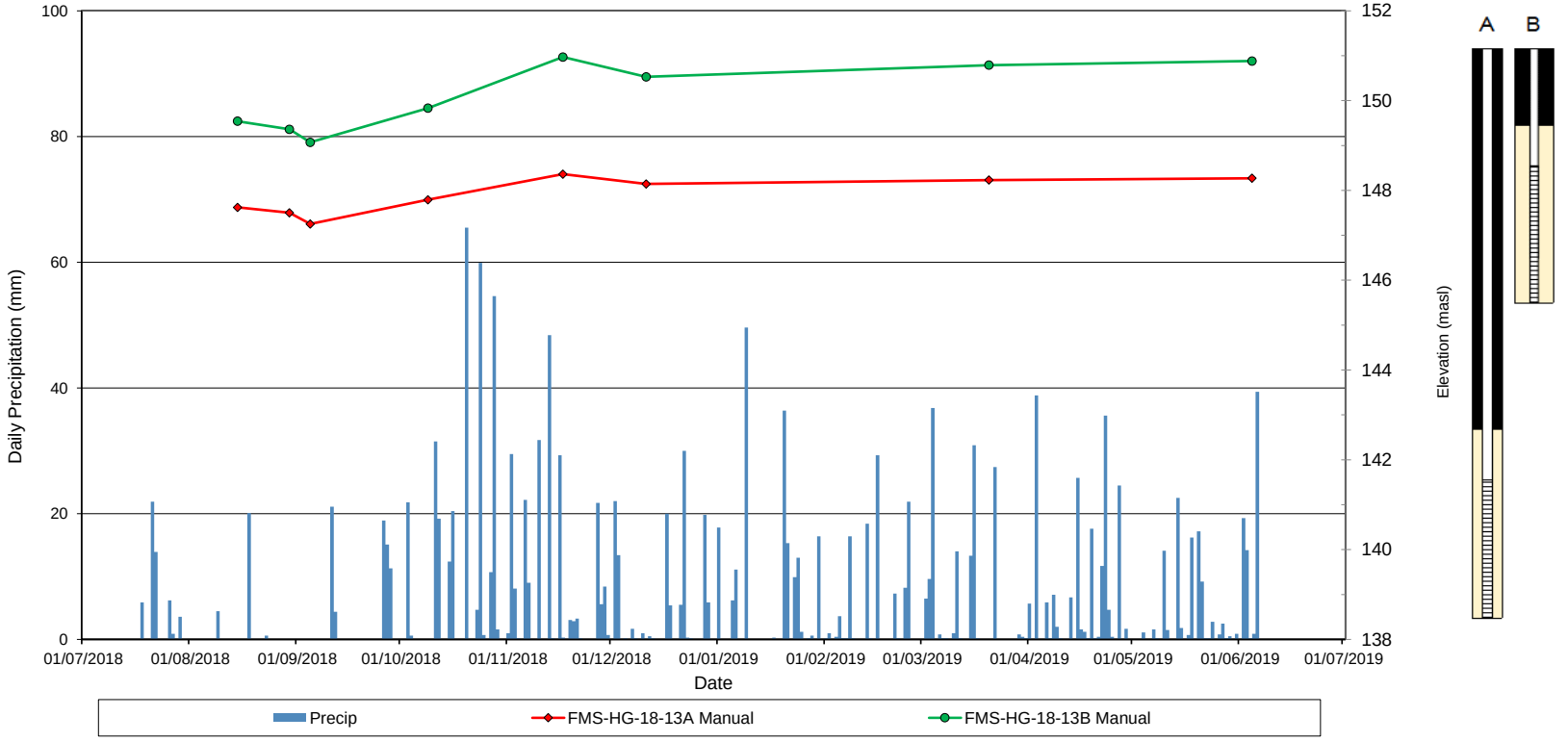
GOLDER

Prepared: CM

Checked: GM

HYDROGRAPH OF MONITORING WELL NEST FMS-HG18-13A/B
GROUNDWATER ELEVATIONS

FIGURE 11



DATE: June 2019

PROJECT: 1895674

Note: Precipitation data from Malay Falls, NS Station, Approximately 18 km away

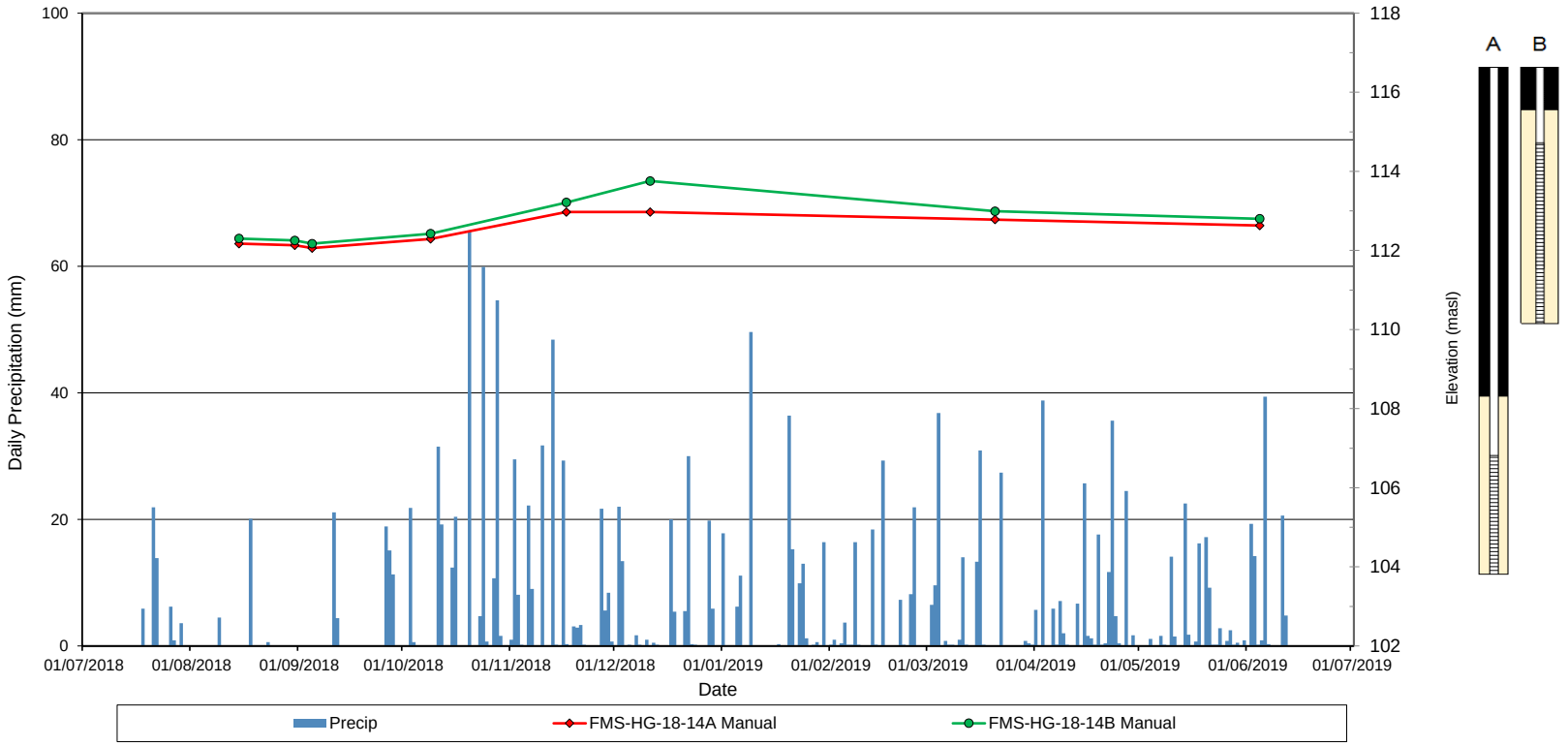
GOLDER

Prepared: CM

Checked: GM

HYDROGRAPH OF MONITORING WELL NEST FMS-HG18-14A/B
GROUNDWATER ELEVATIONS

FIGURE 12



DATE: June 2019

PROJECT: 1895674

Note: Precipitation data from Malay Falls, NS Station, Approximately 18 km away

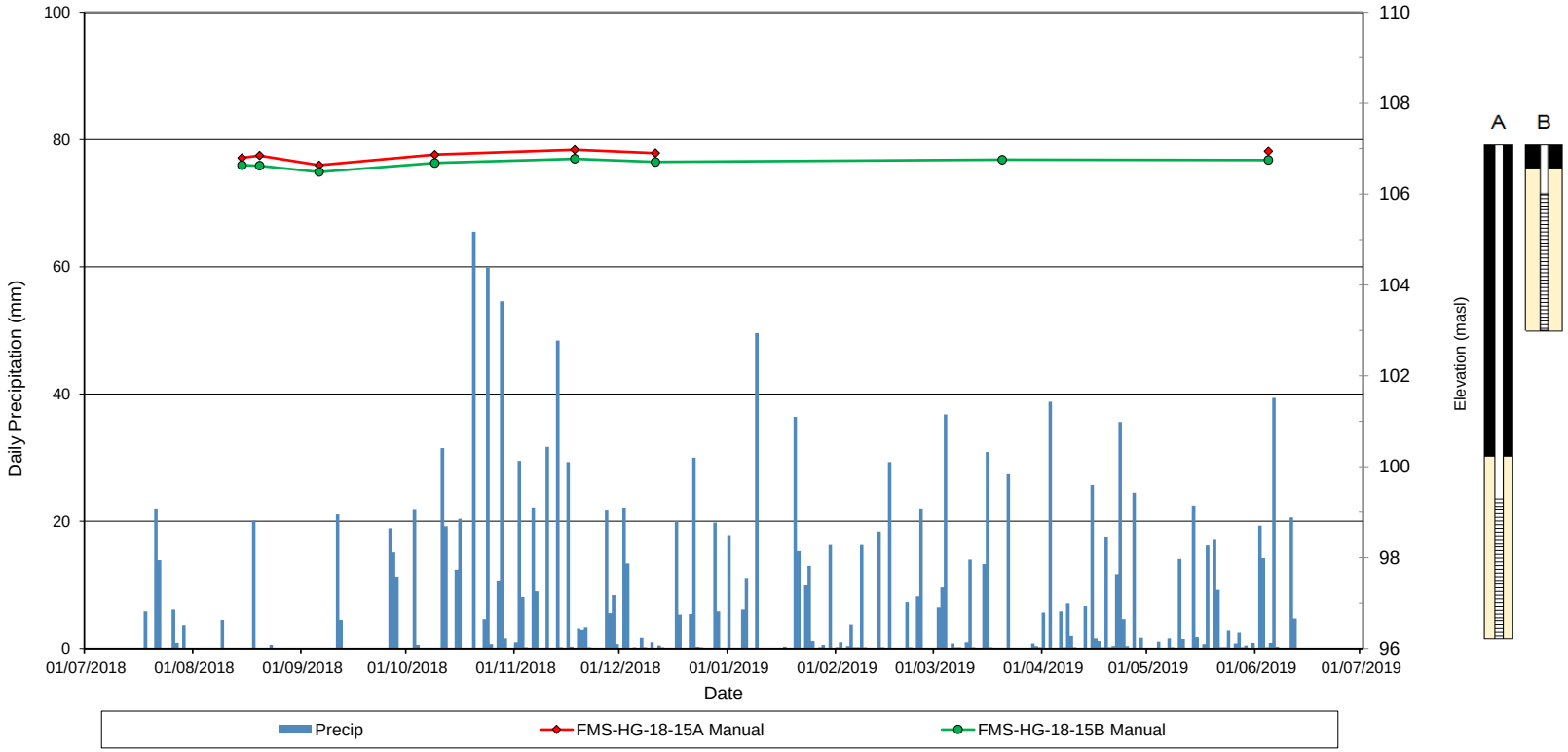
GOLDER

Prepared: CM

Checked: GM

HYDROGRAPH OF MONITORING WELL NEST FMS-HG18-15A/B
GROUNDWATER ELEVATIONS

FIGURE 13



DATE: June 2019

PROJECT: 1895674

Note: Precipitation data from Malay Falls, NS Station, Approximately 18 km away

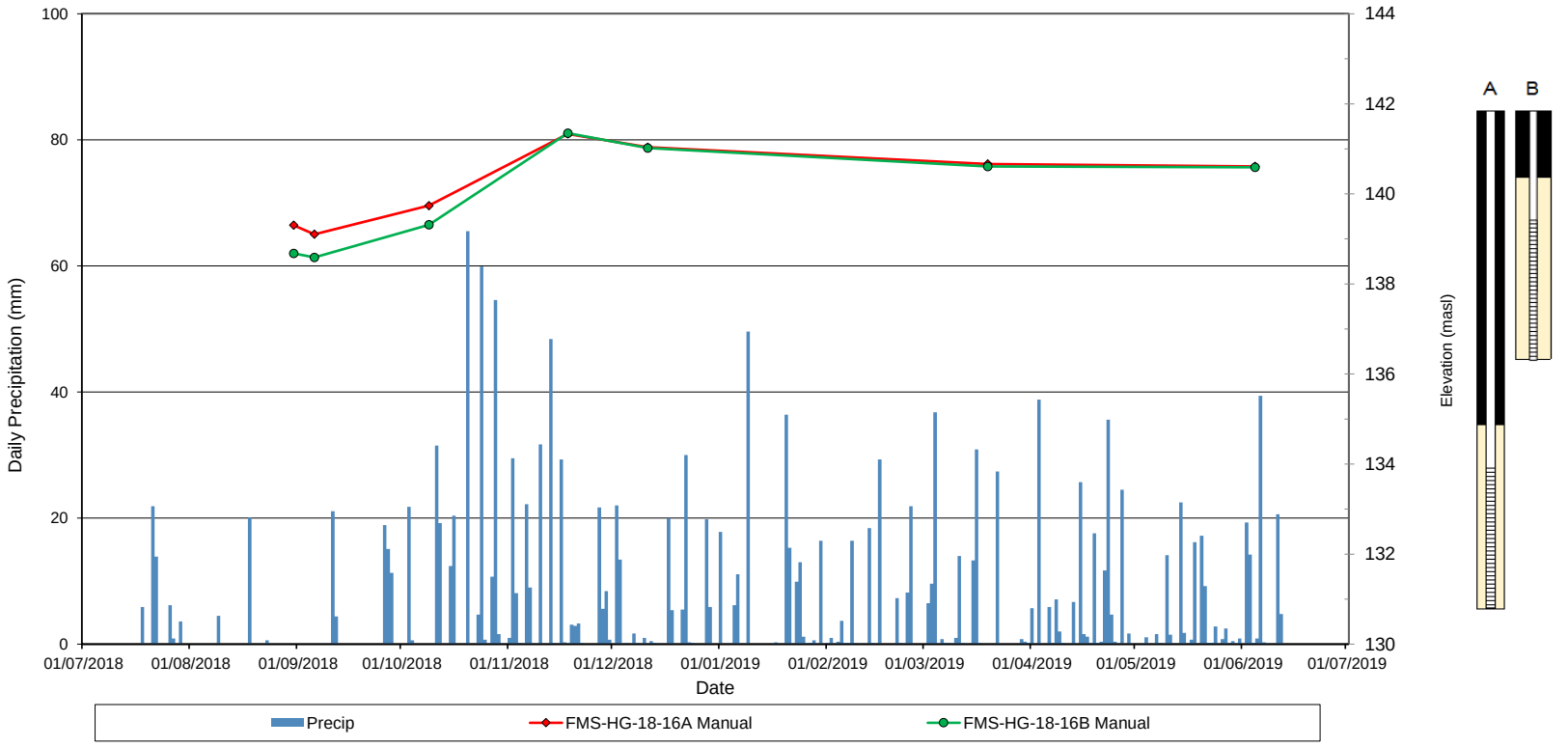
GOLDER

Prepared: CM

Checked: GM

HYDROGRAPH OF MONITORING WELL NEST FMS-HG18-16A/B
GROUNDWATER ELEVATIONS

FIGURE 14



DATE: June 2019

PROJECT: 1895674

Note: Precipitation data from Malay Falls, NS Station, Approximately 18 km away

GOLDER

Prepared: CM

Checked: GM

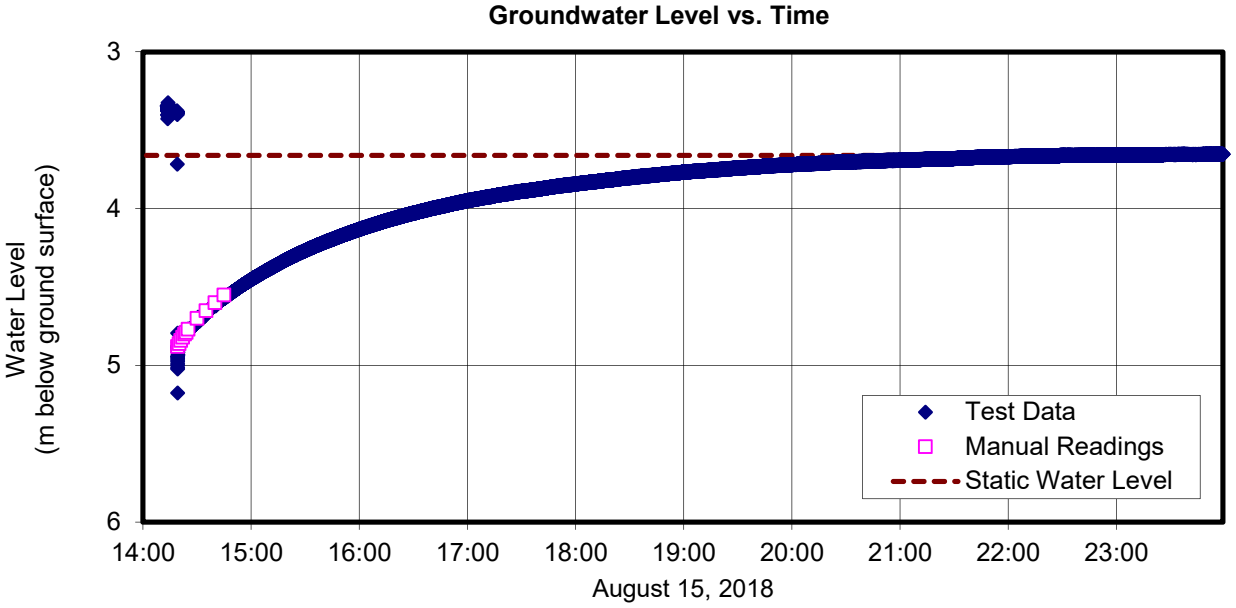
APPENDIX E

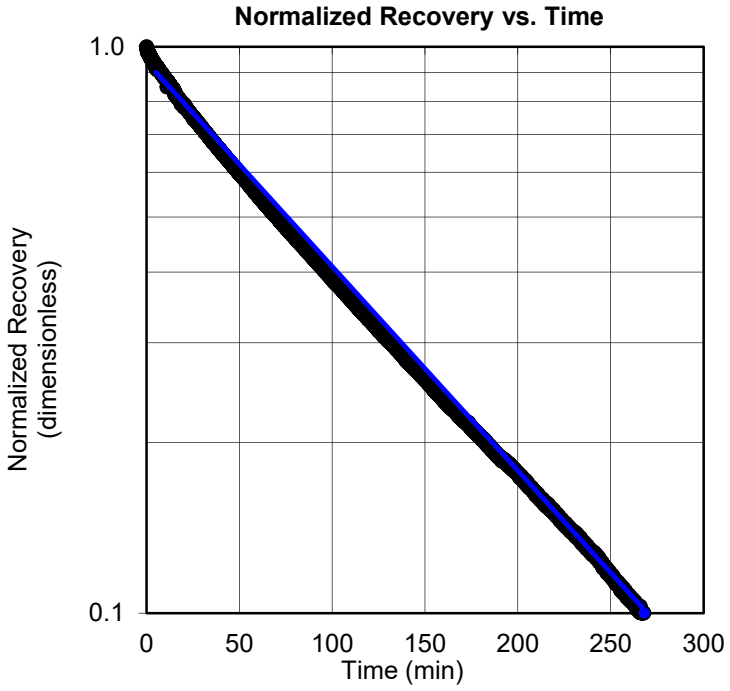
Single Well Response Test Analysis Sheets

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-02A

FIGURE E1





Test Interval (below ground surface)

17.4 m to 20.4 m

Static Water Level (below ground surface)

3.66 m

Test Interval (L) = 3.05 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.90 t_1 = 5 min

h_2/H_0 = 0.27 t_2 = 150 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{6E-8 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

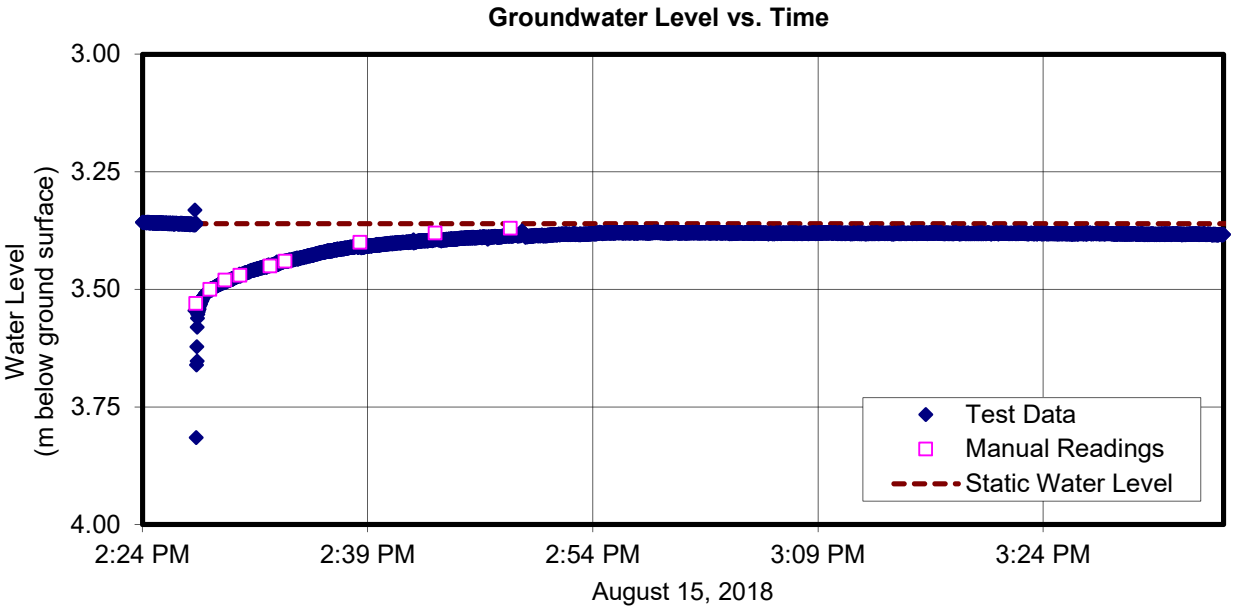
DESIGN: KL

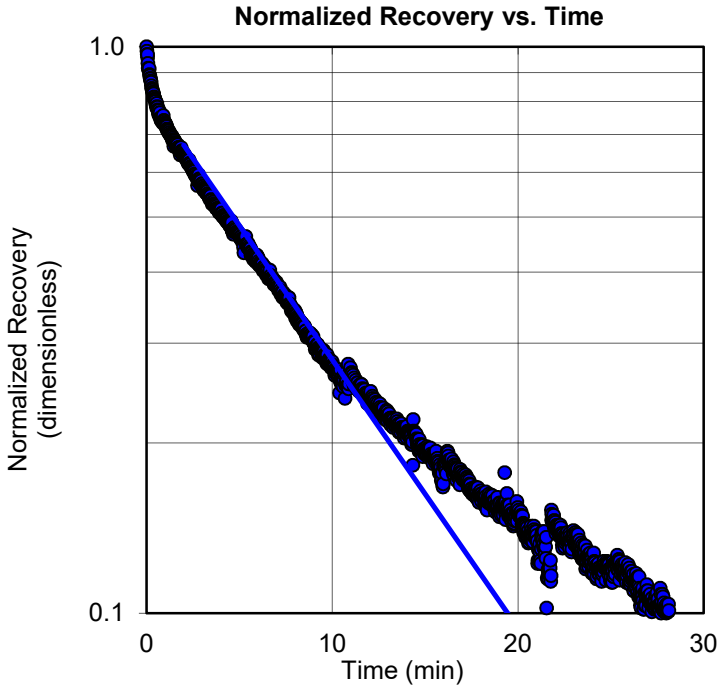
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-02B

FIGURE E2





Test Interval (below ground surface)

3.4 m to 7.0 m

Static Water Level (below ground surface)

3.36 m

Test Interval (L) = 3.67 m

Eff. Well Radius (r) = 0.0338 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.67 t_1 = 2 min

h_2/H_0 = 0.28 t_2 = 10 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{1E-6 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

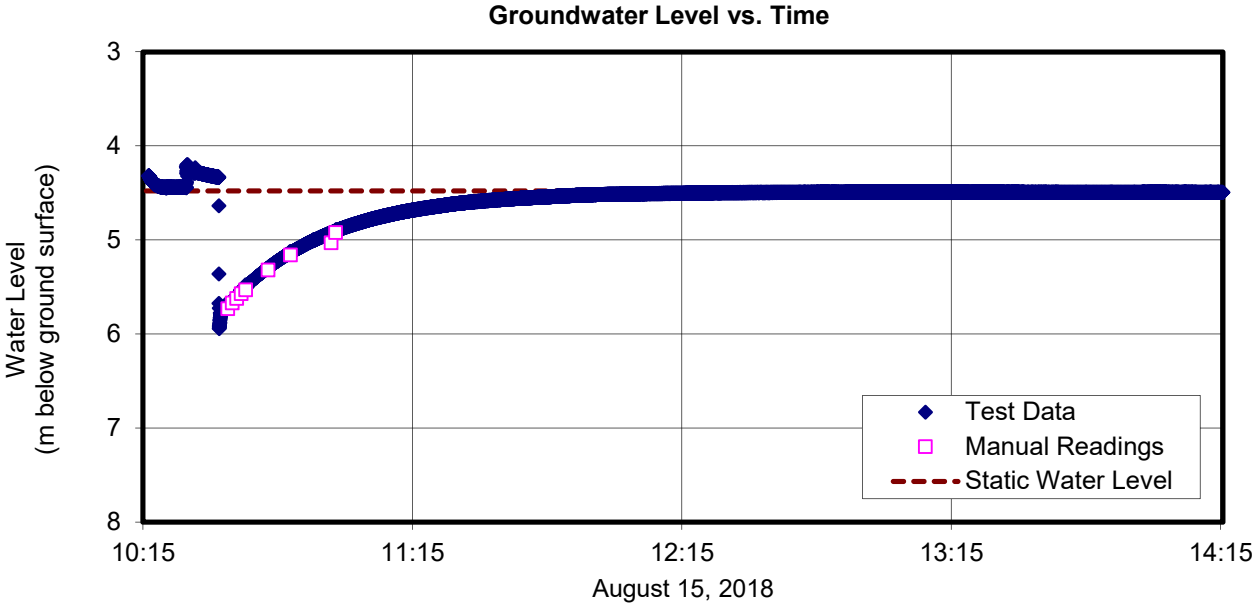
DESIGN: KL

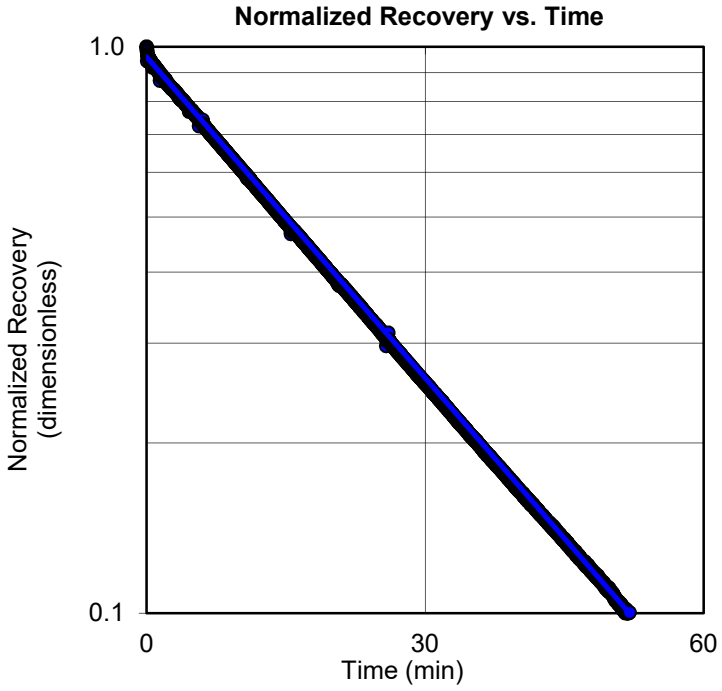
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-03A

FIGURE E3





Test Interval (below ground surface)

8.9 m to 12.0 m

Static Water Level (below ground surface)

4.48 m

Test Interval (L) = 3.05 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.96 t_1 = 0 min

h_2/H_0 = 0.10 t_2 = 52 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{3E-7 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

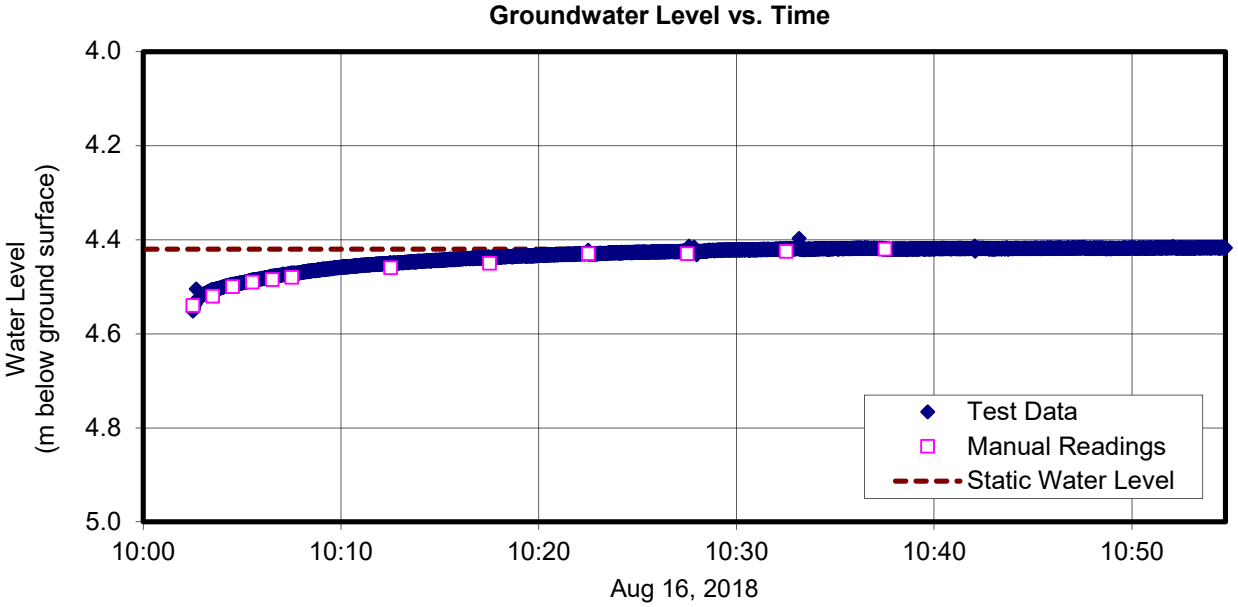
DESIGN: RA

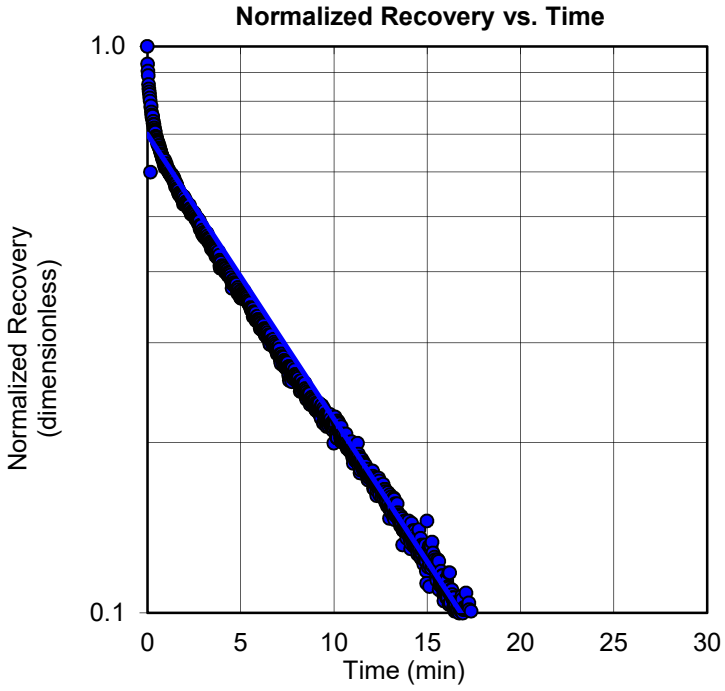
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-03B

FIGURE E4





Test Interval (below ground surface)

4.4 m to 6.9 m

Static Water Level (below ground surface)

4.42 m

Test Interval (L) = 2.47 m

Eff. Well Radius (r) = 0.0336 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.70 t_1 = 0 min

h_2/H_0 = 0.22 t_2 = 10 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{2E-6 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

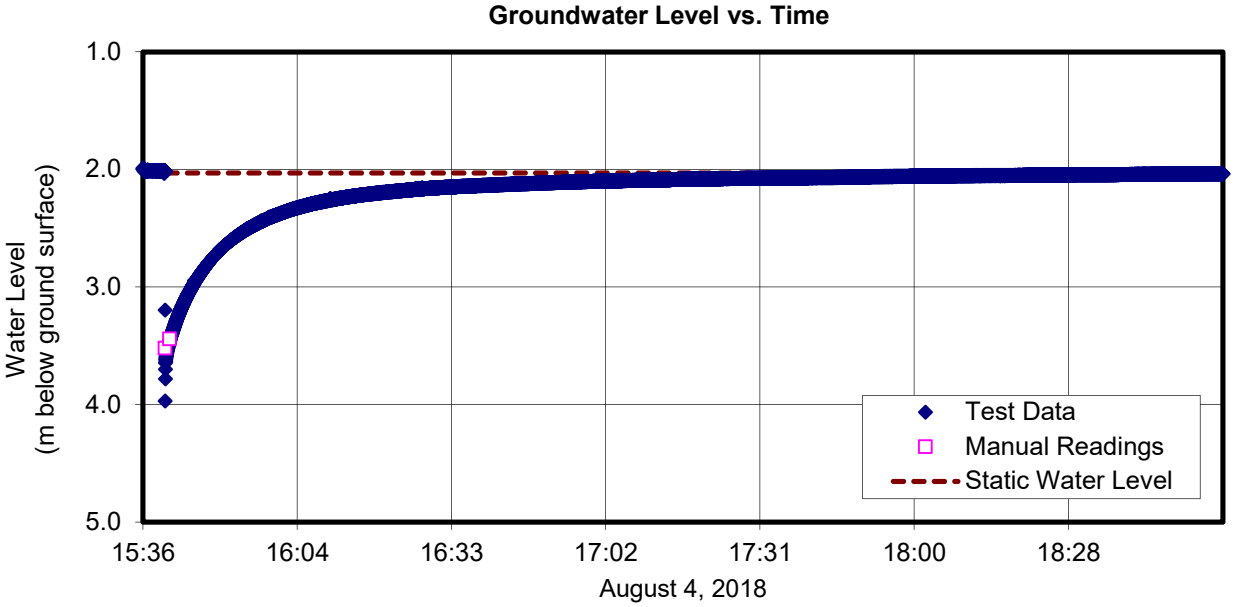
DESIGN: RA

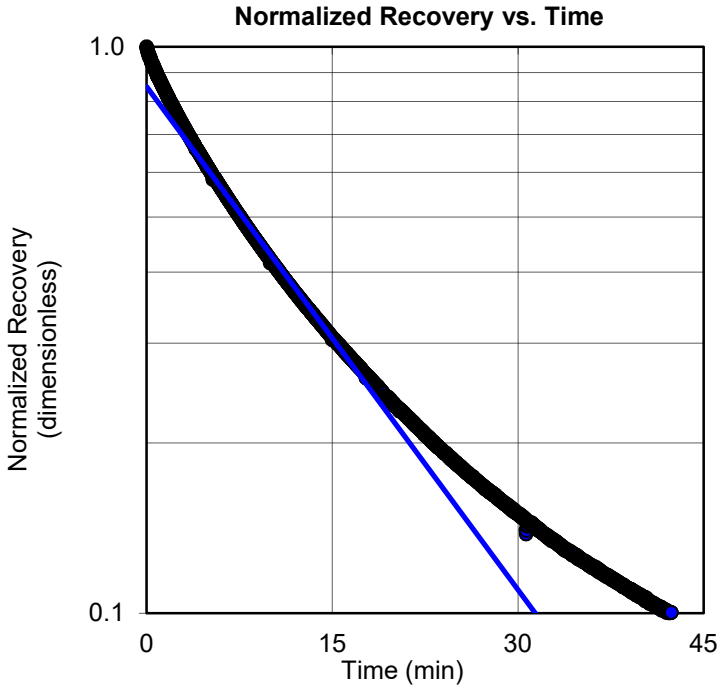
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-04A

FIGURE E5





Test Interval (below ground surface)

14.9 m to 21.0 m

Static Water Level (below ground surface)

2.03 m

Test Interval (L) = 6.1 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.85 t_1 = 0 min

h_2/H_0 = 0.11 t_2 = 30 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{3E-7 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

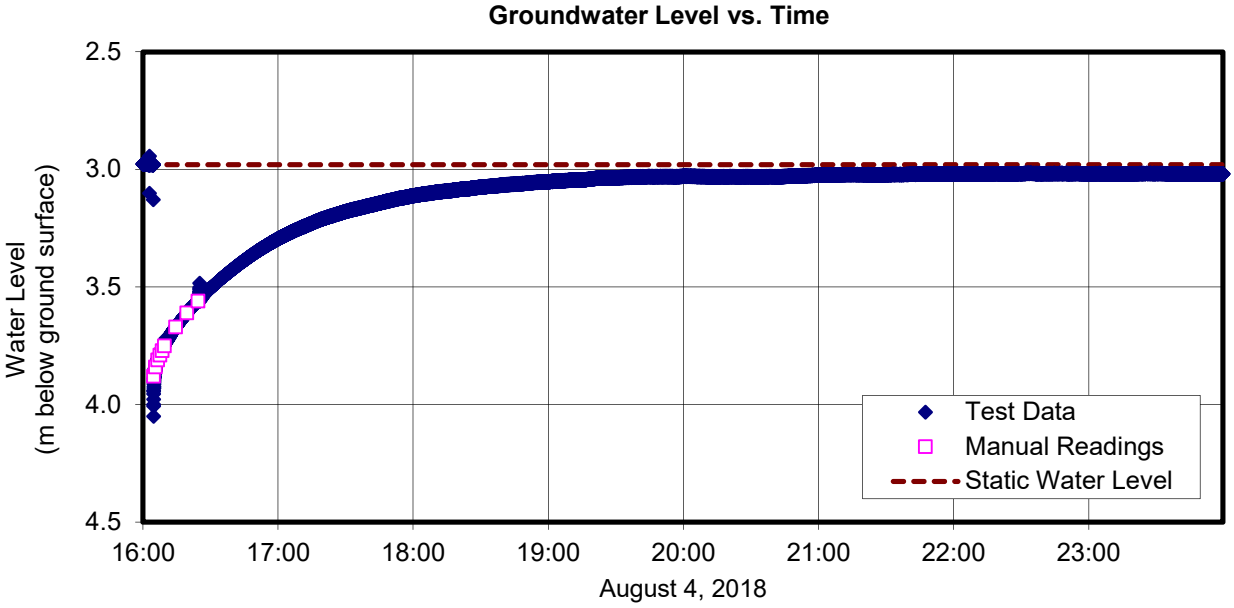
DESIGN: KL

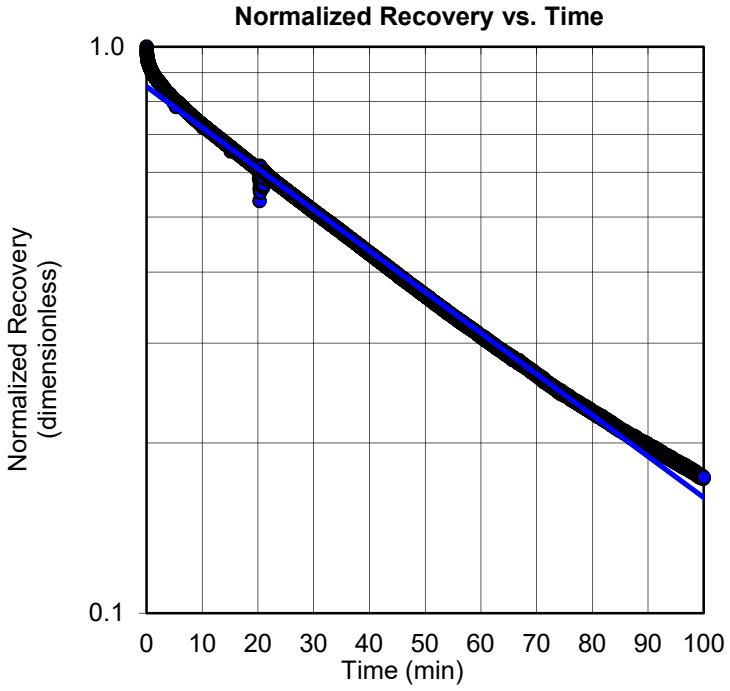
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-04B

FIGURE E6





Test Interval (below ground surface)

4.1 m to 7.1 m

Static Water Level (below ground surface)

2.98 m

Test Interval (L) = 3.05 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.85 t_1 = 0 min

h_2/H_0 = 0.16 t_2 = 100 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{1E-7 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

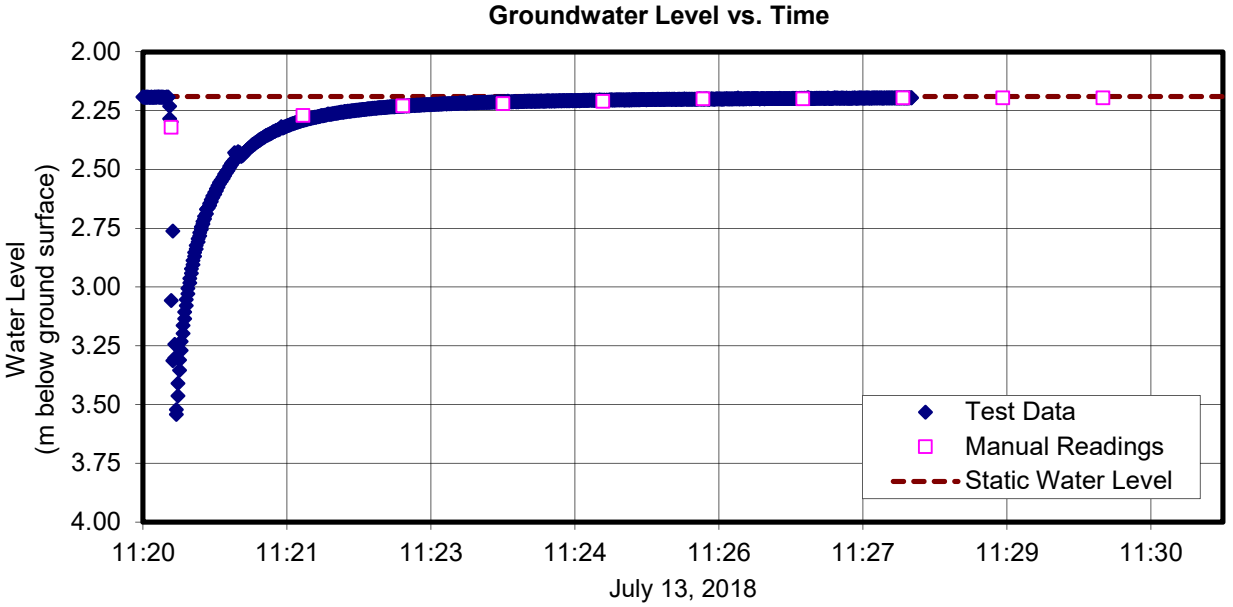
DESIGN: KL

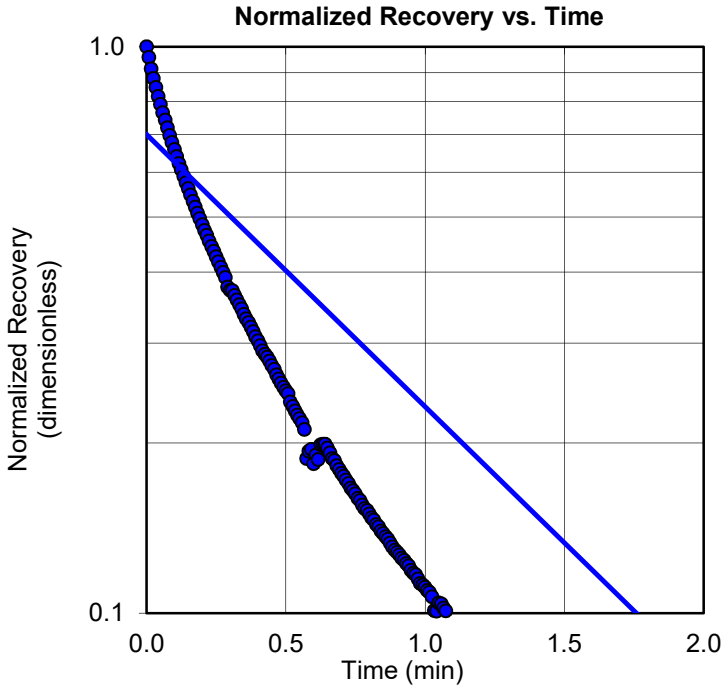
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-05A

FIGURE E7





Test Interval (below ground surface)

9.2 m to 13.7 m

Static Water Level (below ground surface)

2.19 m

Test Interval (L) = 4.53 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.70 t_1 = 0 min

h_2/H_0 = 0.25 t_2 = 0.5 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{1E-5 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

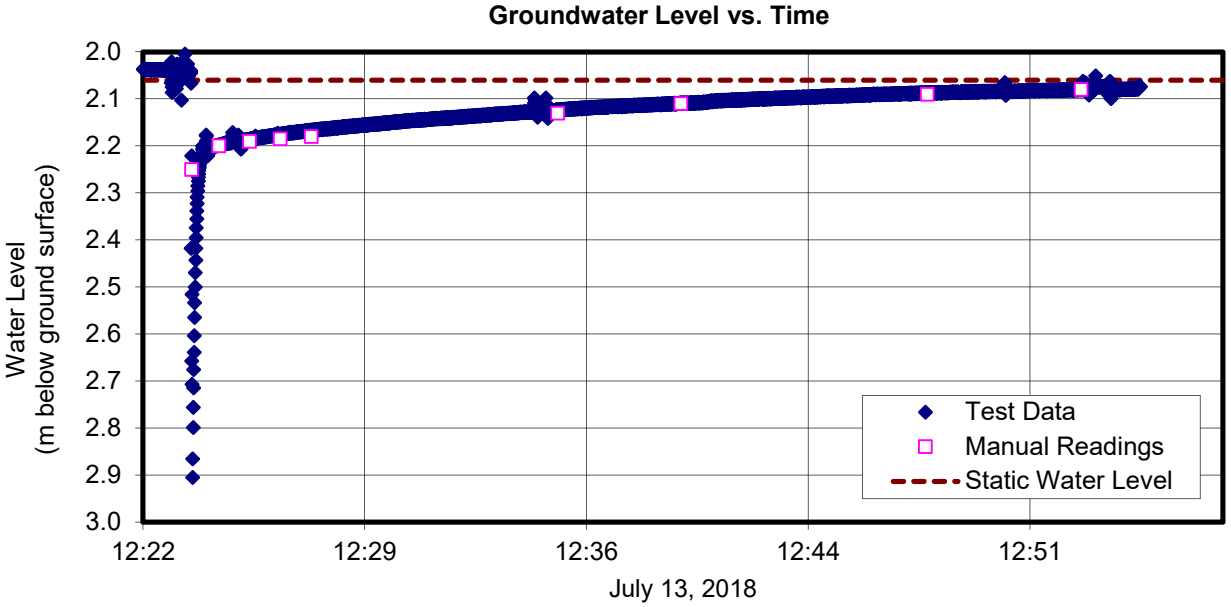
DESIGN: KL

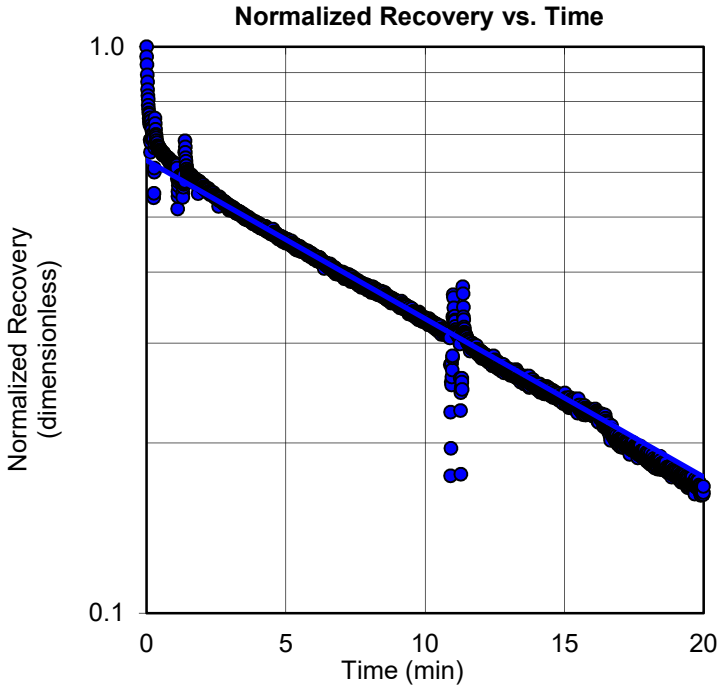
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-05B

FIGURE E8





Test Interval (below ground surface)

2.8 m to 5.9 m

Static Water Level (below ground surface)

2.06 m

Test Interval (L) = 3.05 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.63 t_1 = 0 min

h_2/H_0 = 0.24 t_2 = 15 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{5E-7 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

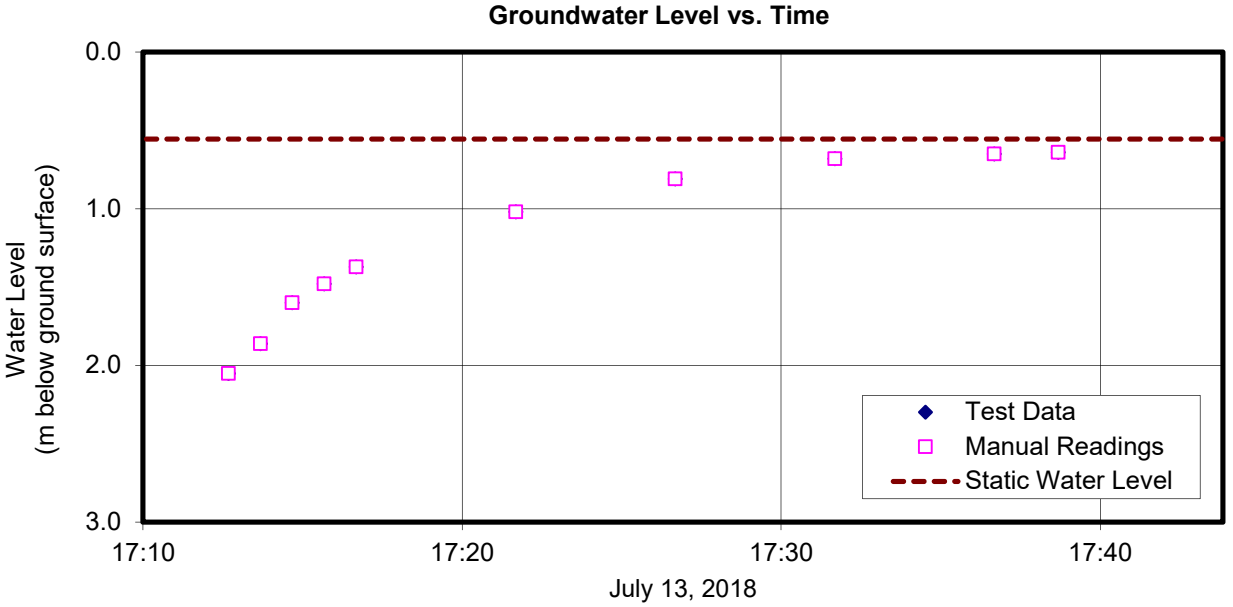
DESIGN: KL

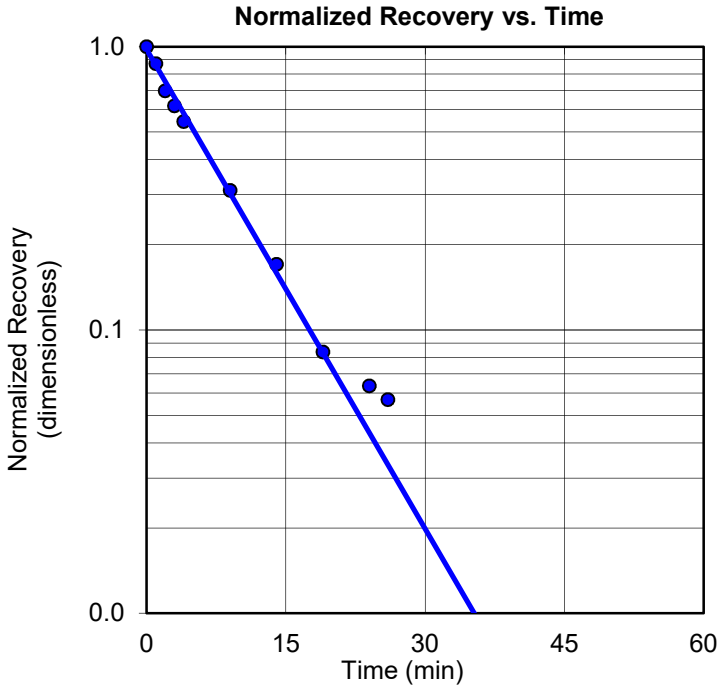
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-07A

FIGURE E9





Test Interval (below ground surface)

7.7 m to 10.7 m

Static Water Level (below ground surface)

0.56 m

Test Interval (L) = 3.05 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.98 t_1 = 0 min

h_2/H_0 = 0.08 t_2 = 19 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{1E-6 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

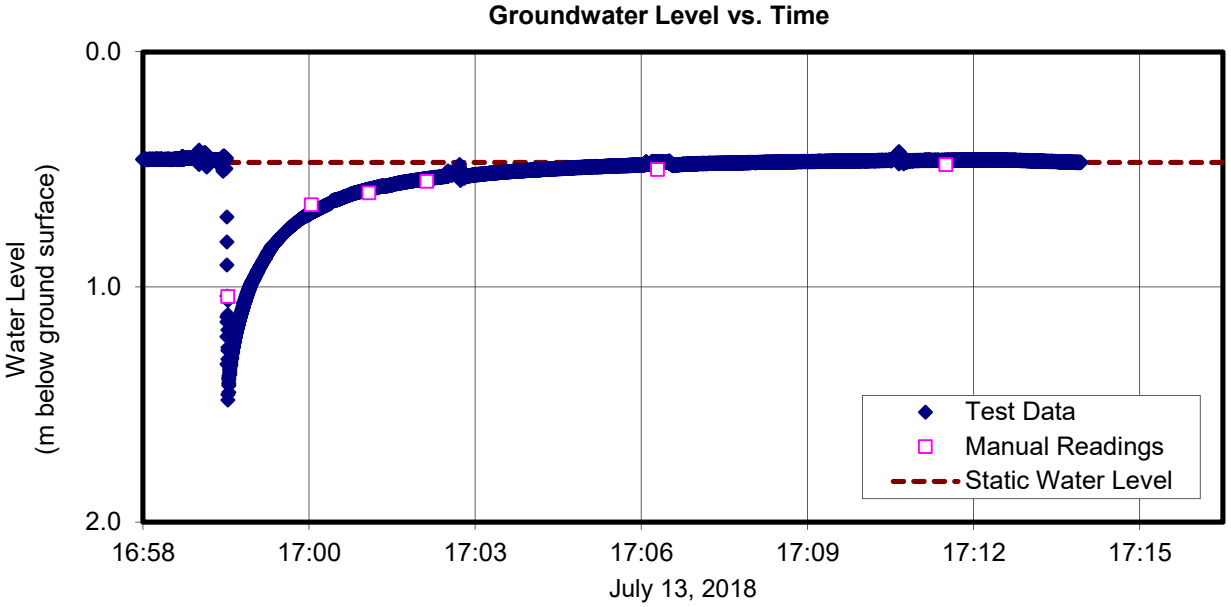
DESIGN: KL

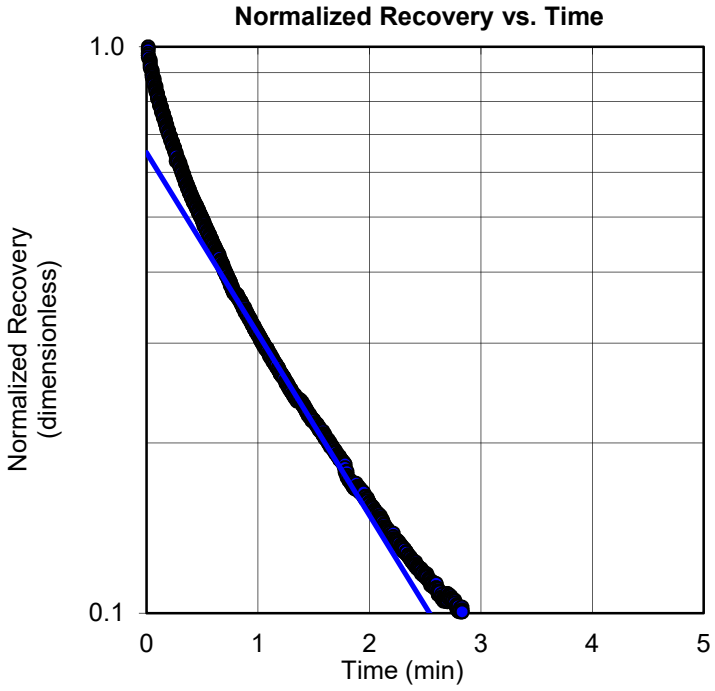
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-07B

FIGURE E10





Test Interval (below ground surface)

1.7 m to 4.8 m

Static Water Level (below ground surface)

0.47 m

Test Interval (L) = 3.05 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.65 t_1 = 0 min

h_2/H_0 = 0.20 t_2 = 1.6 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{5E-6 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

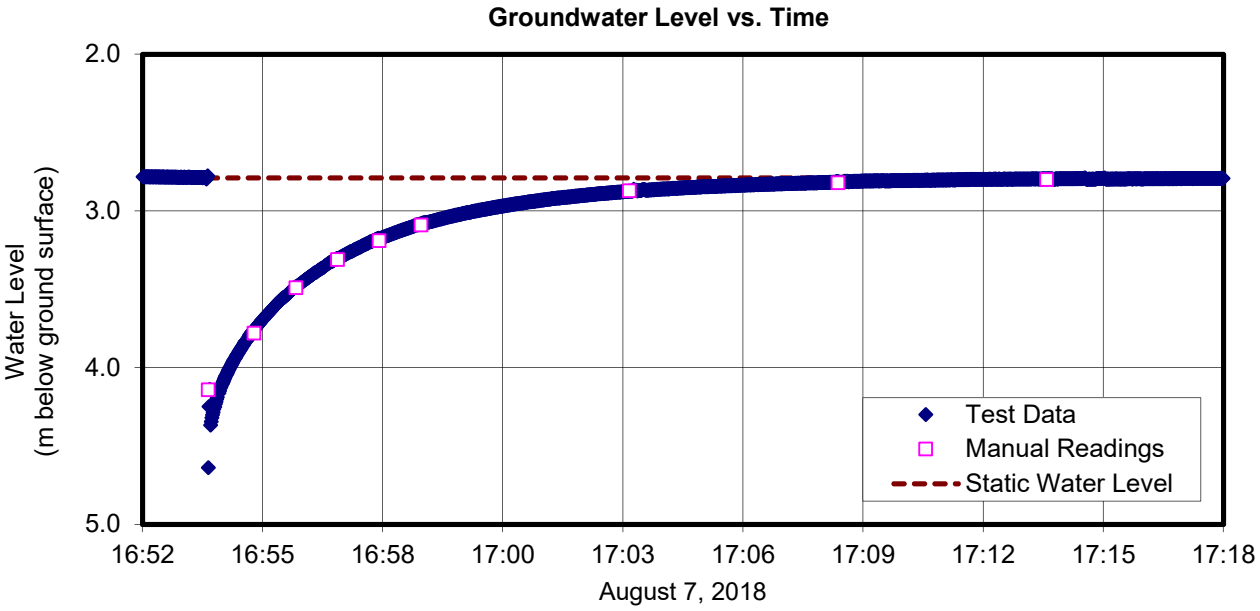
DESIGN: KL

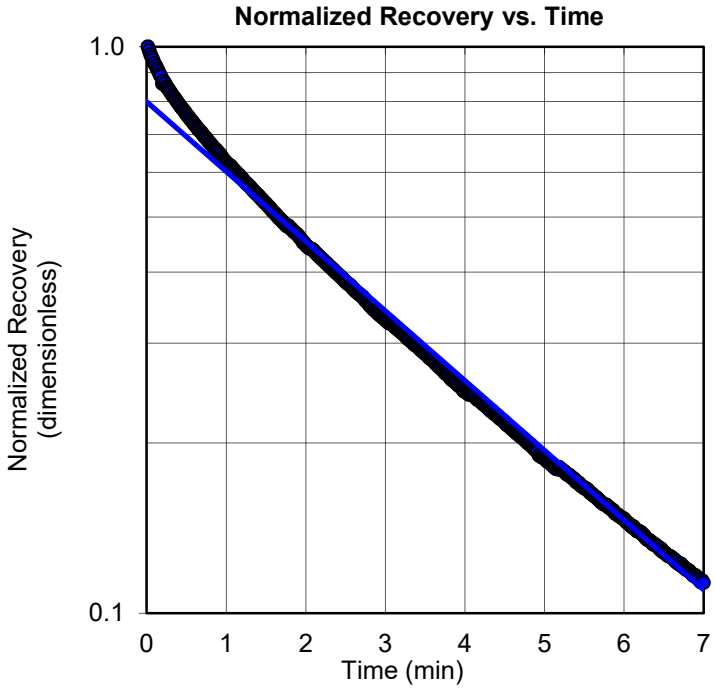
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-08A

FIGURE E11





Test Interval (below ground surface)

10.3 m to 13.3 m

Static Water Level (below ground surface)

2.79 m

Test Interval (L) = 3.05 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.80 t_1 = 0 min

h_2/H_0 = 0.11 t_2 = 7 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{2E-6 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

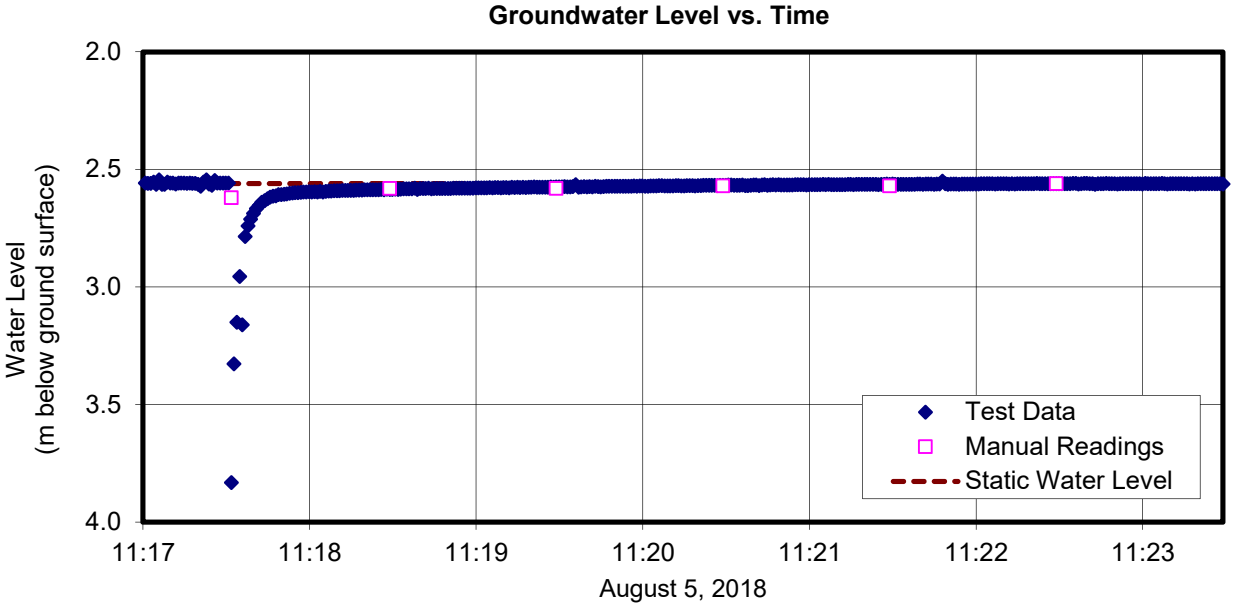
DESIGN: KL

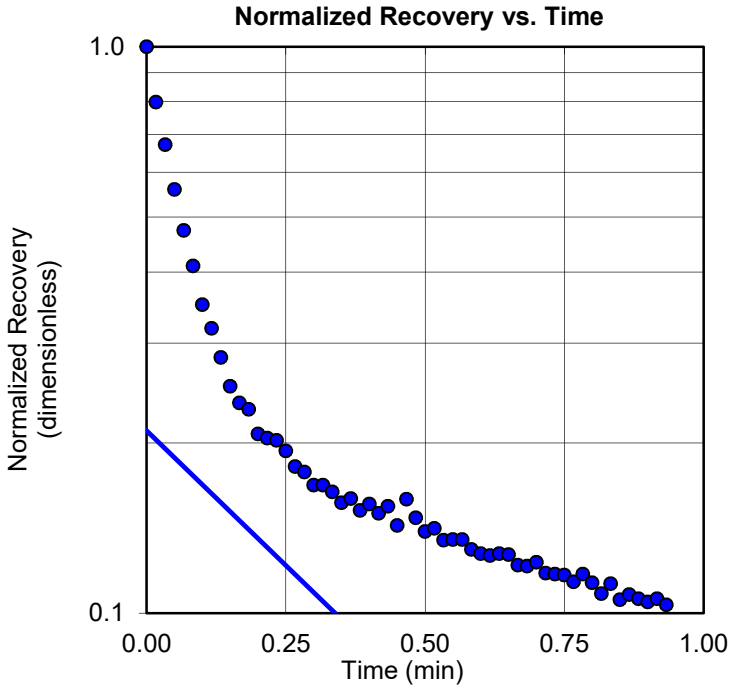
CHECK: RA

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-08B

FIGURE E12





Test Interval (below ground surface)

2.6 m to 6.0 m

Static Water Level (below ground surface)

2.56 m

Test Interval (L) = 3.4 m

Eff. Well Radius (r) = 0.0338 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.21 t_1 = 0 min

h_2/H_0 = 0.10 t_2 = 1 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{9E-6 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

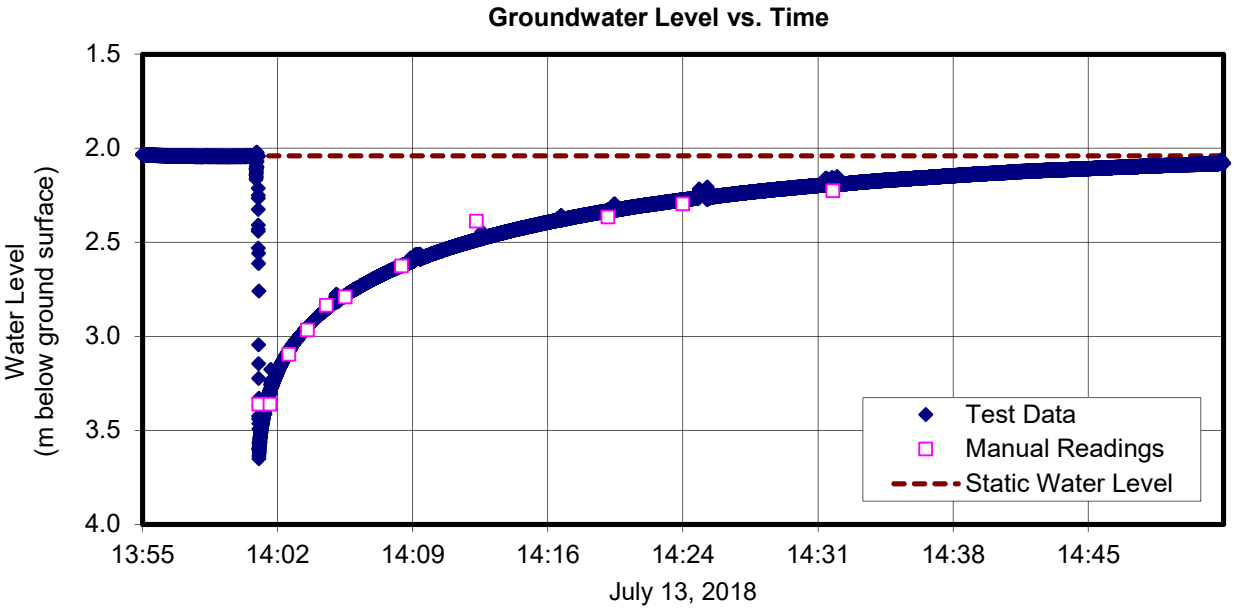
DESIGN: KL

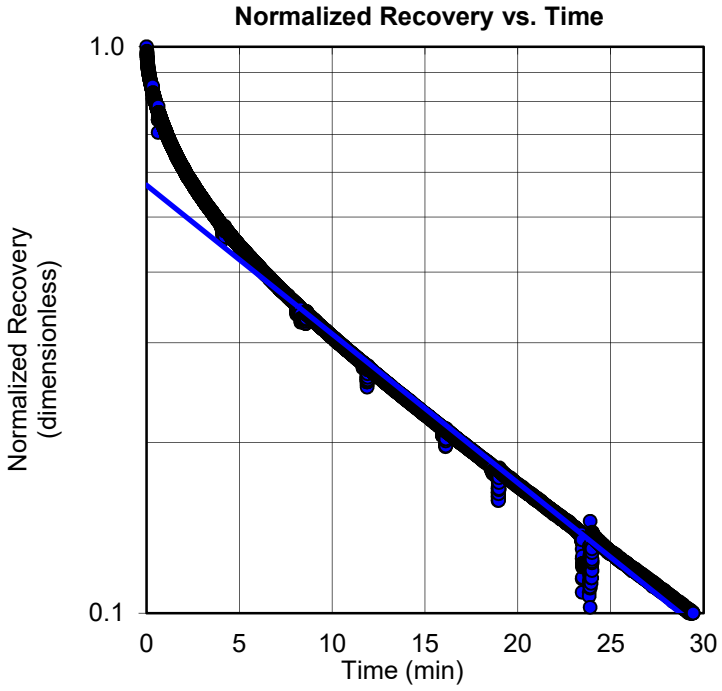
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-09A

FIGURE E13





Test Interval (below ground surface)

9.0 m to 12.0 m

Static Water Level (below ground surface)

2.04 m

Test Interval (L) = 3.05 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.57 t_1 = 0 min

h_2/H_0 = 0.23 t_2 = 15 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{4E-7 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

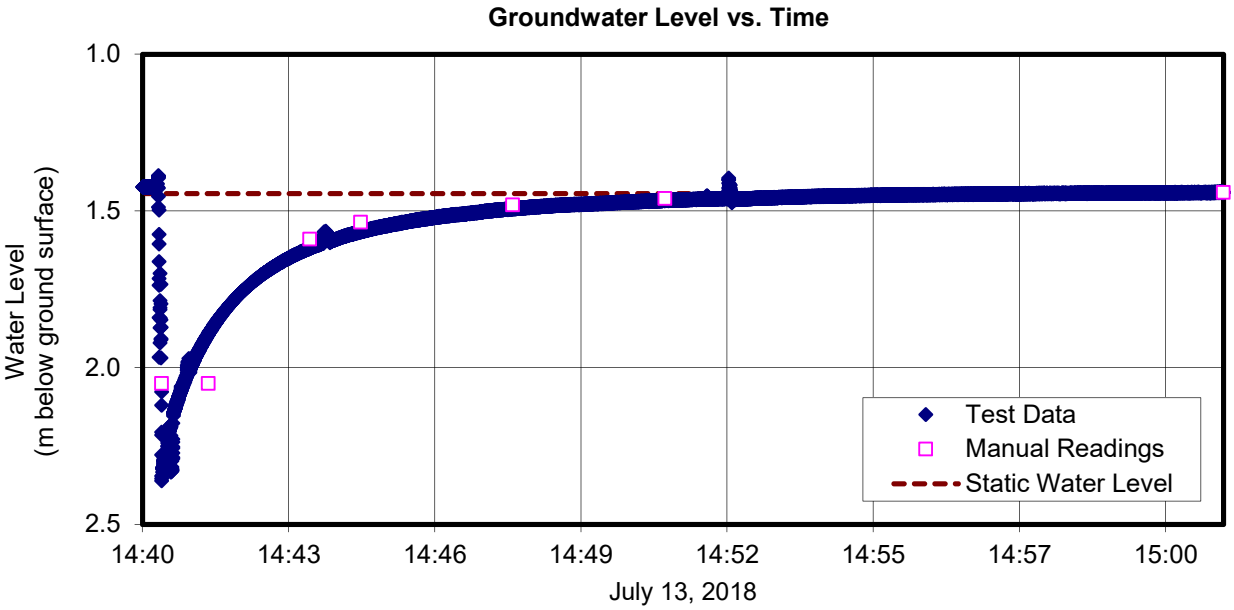
DESIGN: KL

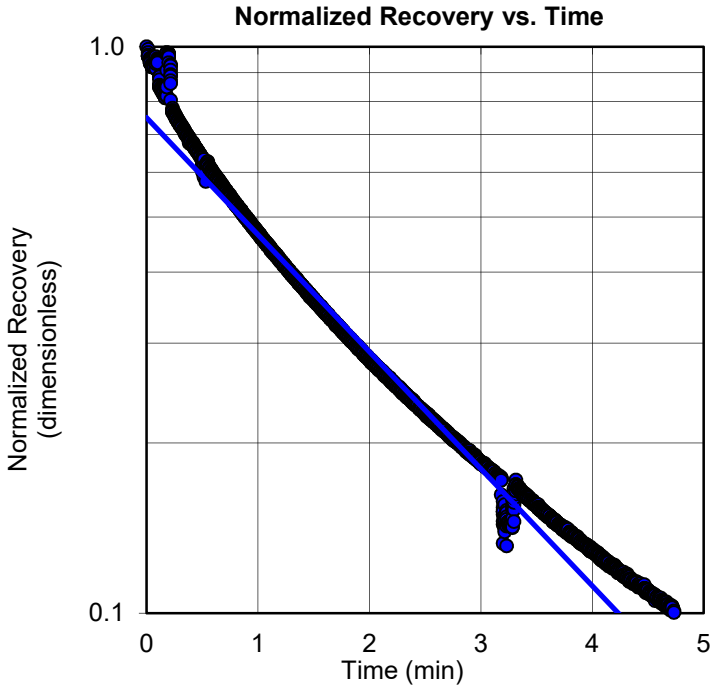
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-09B

FIGURE E14





Test Interval (below ground surface)

3.1 m to 6.2 m

Static Water Level (below ground surface)

1.45 m

Test Interval (L) = 3.05 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.75 t_1 = 0 min

h_2/H_0 = 0.18 t_2 = 3 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{3E-6 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

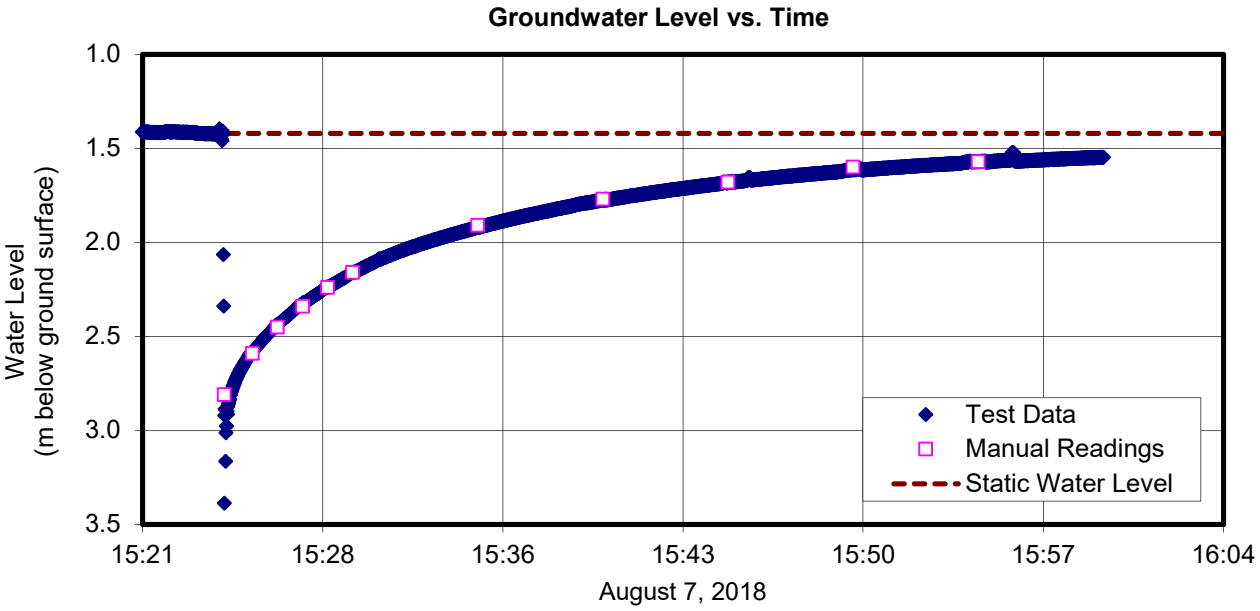
DESIGN: KL

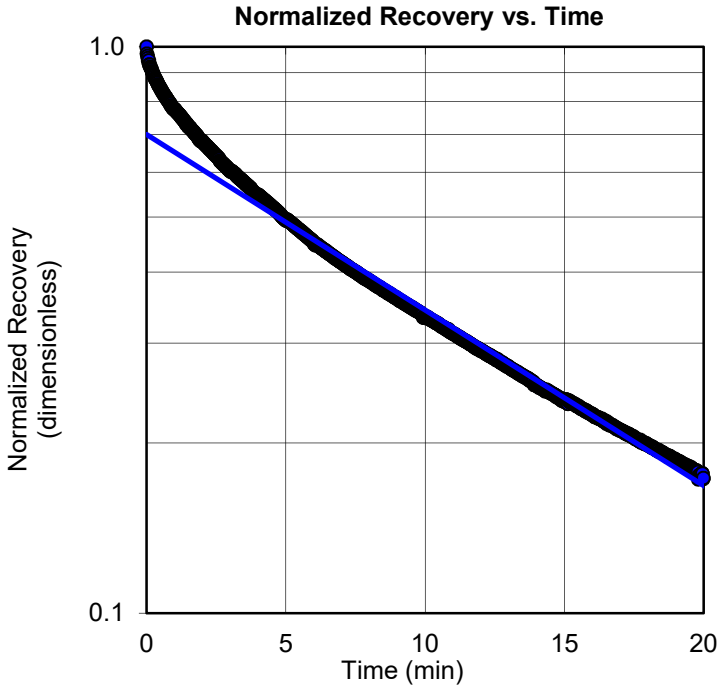
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-10A

FIGURE E15





Test Interval (below ground surface)

9.2 m to 12.3 m

Static Water Level (below ground surface)

1.42 m

Test Interval (L) = 3.05 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.70 t_1 = 0 min

h_2/H_0 = 0.24 t_2 = 15 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{5E-7 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

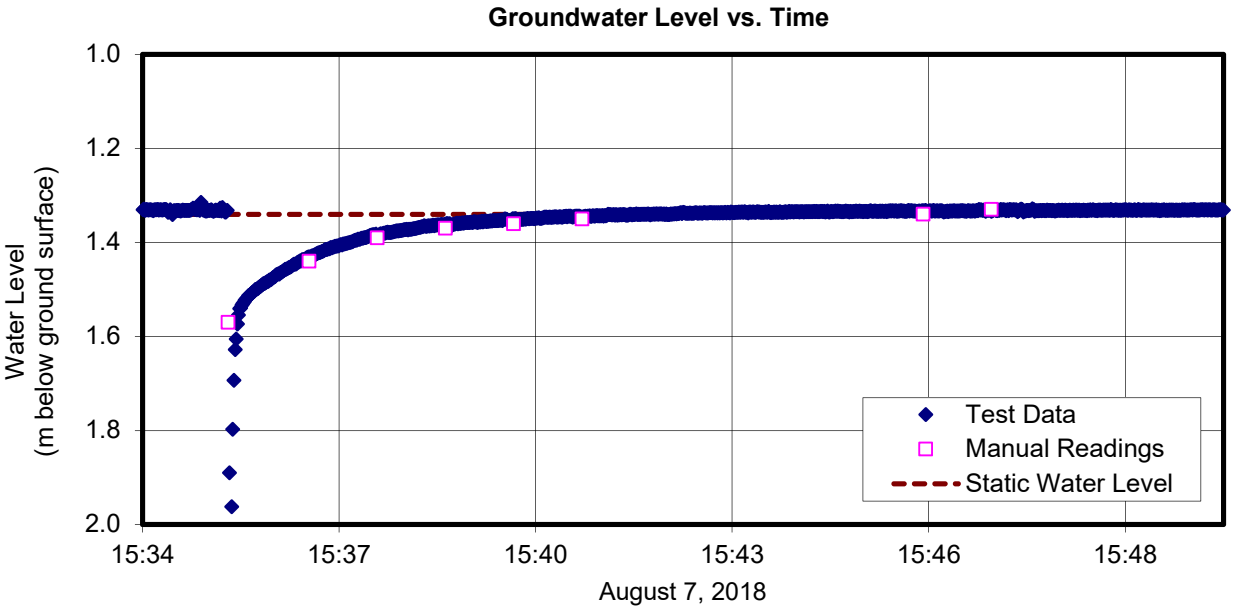
DESIGN: KL

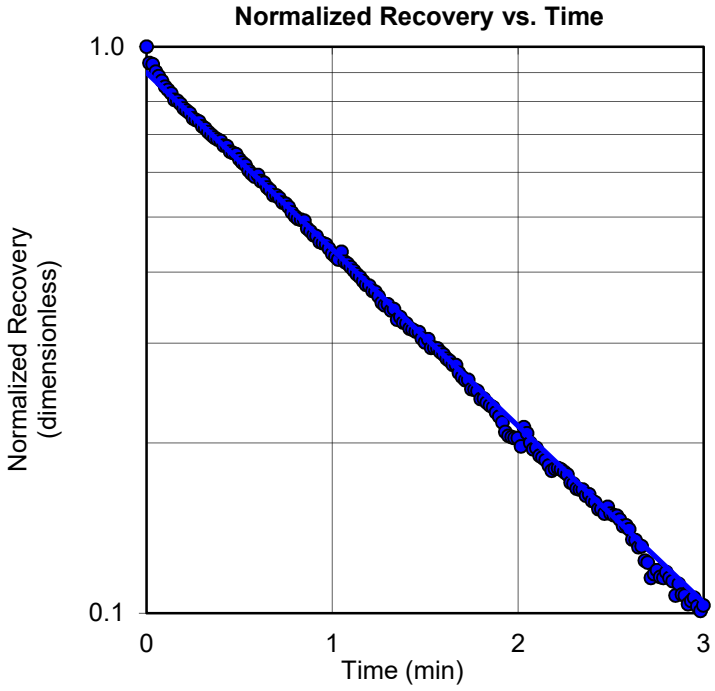
CHECK: RA

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-10B

FIGURE E16





Test Interval (below ground surface)

1.9 m to 6.5 m

Static Water Level (below ground surface)

1.34 m

Test Interval (L) = 4.57 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.90 t_1 = 0 min

h_2/H_0 = 0.23 t_2 = 1.9 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{4E-6 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

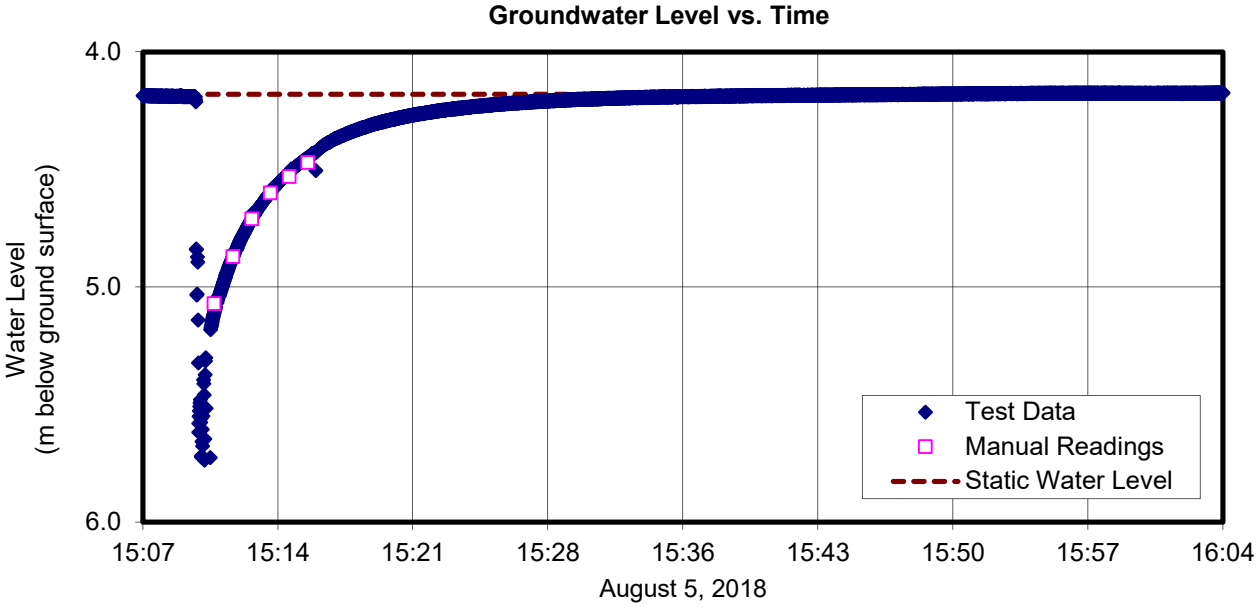
DESIGN: KL

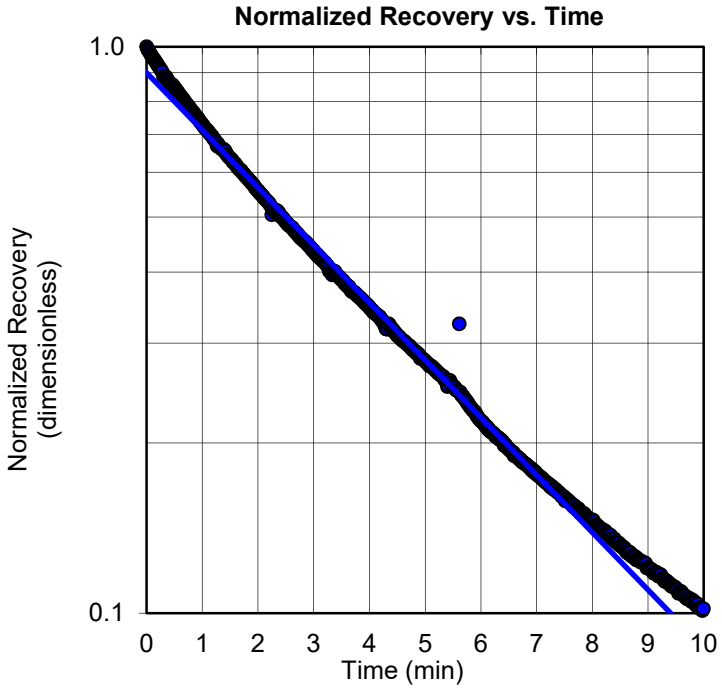
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-11A

FIGURE E17





Test Interval (below ground surface)

7.9 m to 10.9 m

Static Water Level (below ground surface)

4.18 m

Test Interval (L) = 3.05 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.90 t_1 = 0 min

h_2/H_0 = 0.28 t_2 = 5 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{2E-6 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

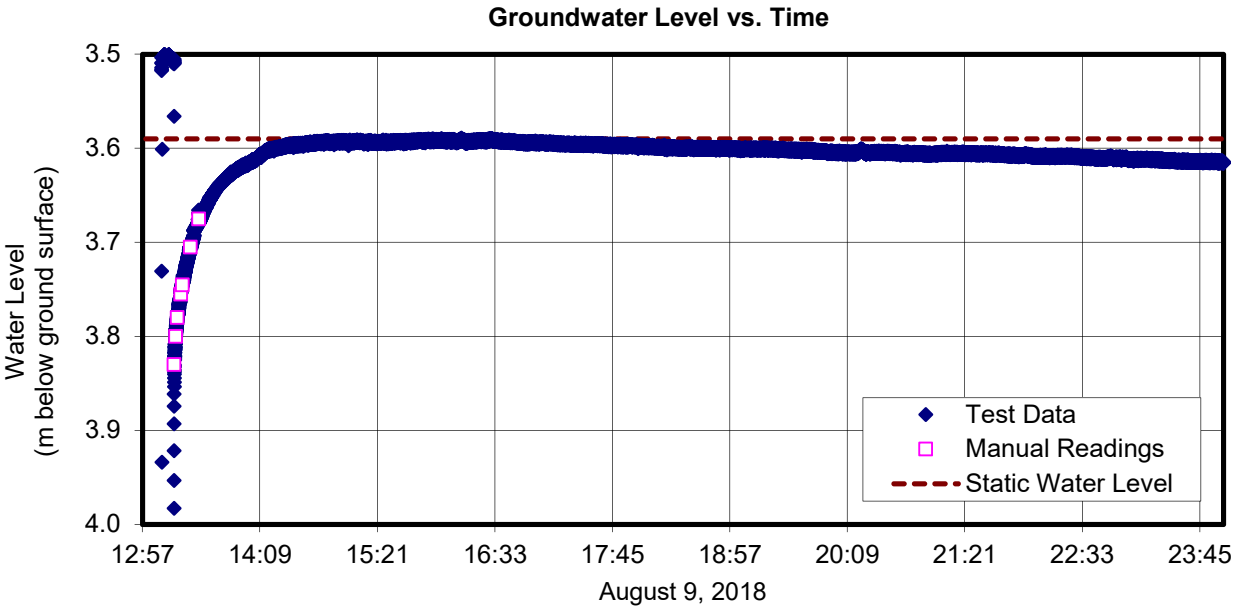
DESIGN: KL

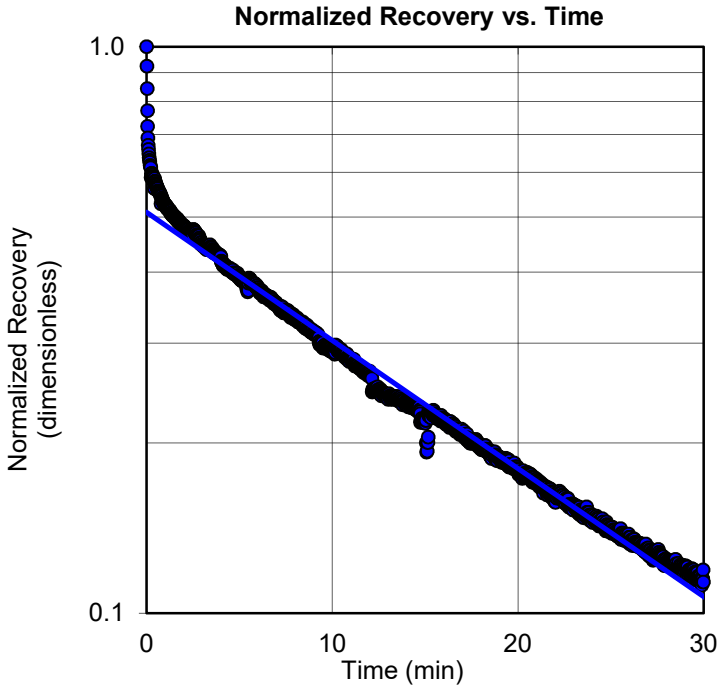
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-11B

FIGURE E18





Test Interval (below ground surface)

3.6 m to 4.9 m

Static Water Level (below ground surface)

3.59 m

Test Interval (L) = 1.31 m

Eff. Well Radius (r) = 0.0338 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.51 t_1 = 0 min

h_2/H_0 = 0.18 t_2 = 20 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{1E-6 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

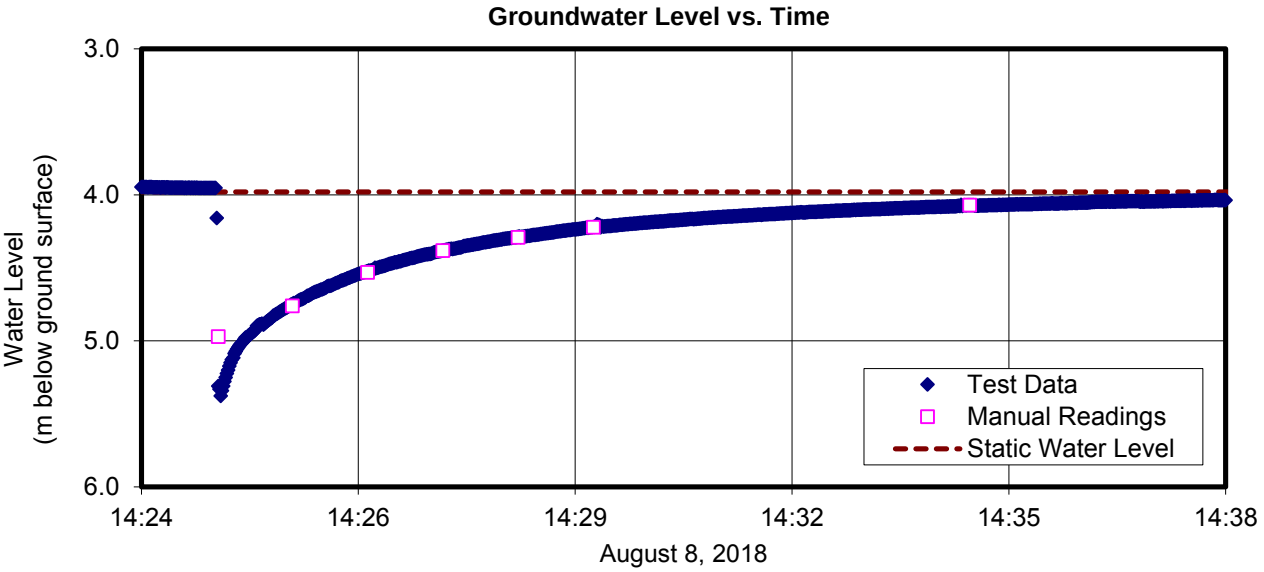
DESIGN: KL

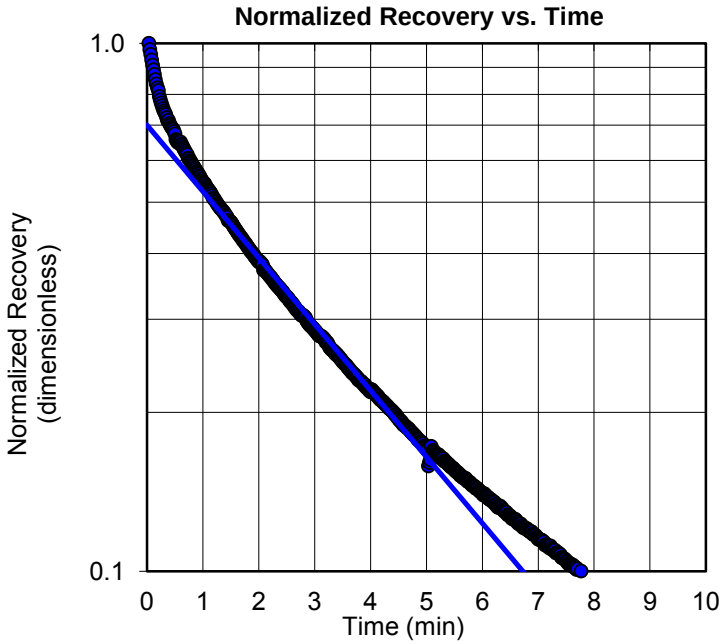
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-13A

FIGURE E19





Test Interval (below ground surface)

9.4 m to 12.4 m

Static Water Level (below ground surface)

3.98 m

Test Interval (L) = 3.05 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.70 t_1 = 0 min

h_2/H_0 = 0.22 t_2 = 4 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{2E-6 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

DESIGN: KL

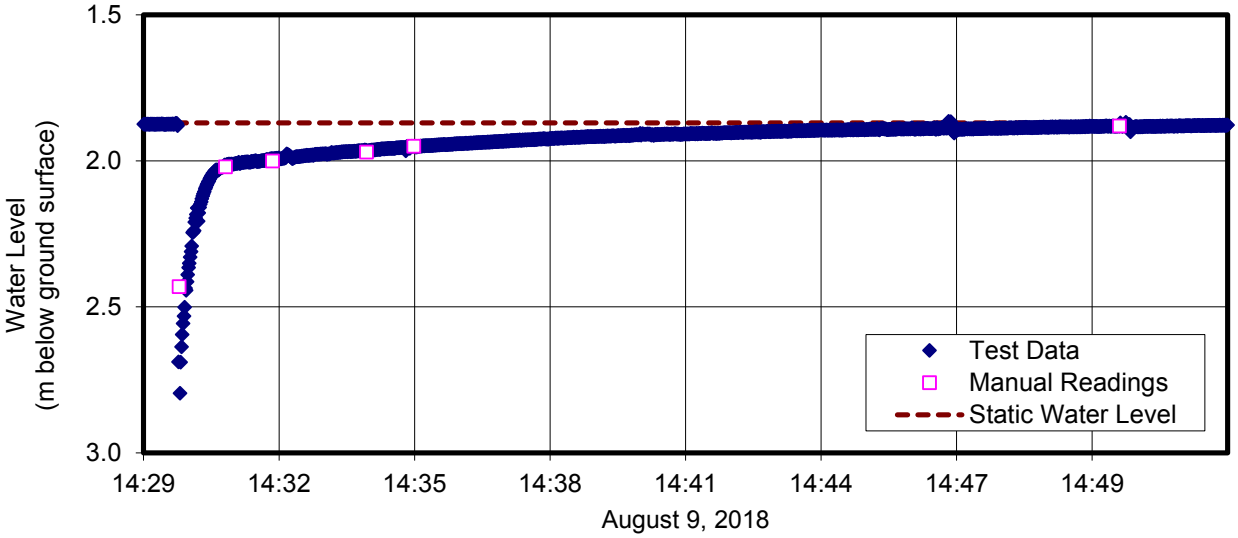
CHECK: RA

In-Situ Hydraulic Conductivity Test Report

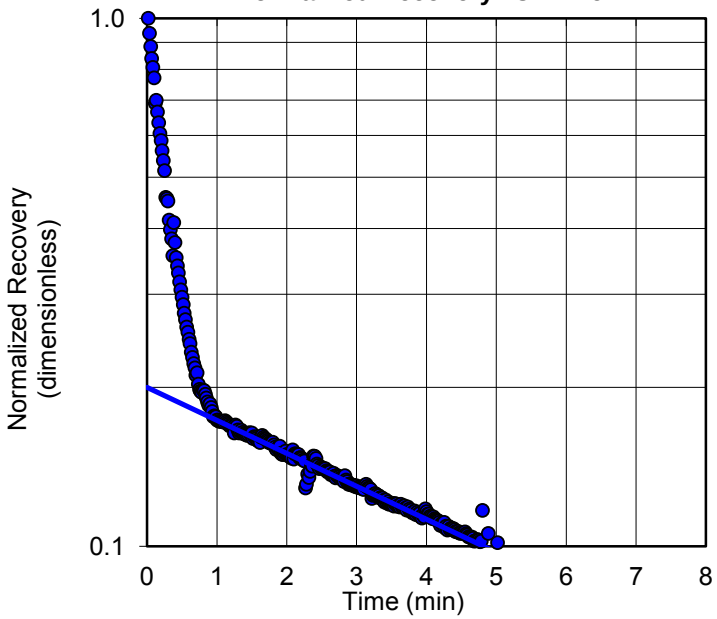
Borehole FMS-HG18-13B

FIGURE E20

Groundwater Level vs. Time



Normalized Recovery vs. Time



Test Interval (below ground surface)

2.5 m to 5.6 m

Static Water Level (below ground surface)

1.87 m

Test Interval (L) = 3.05 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.20 t_1 = 0 min

h_2/H_0 = 0.15 t_2 = 2 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{1E-6 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

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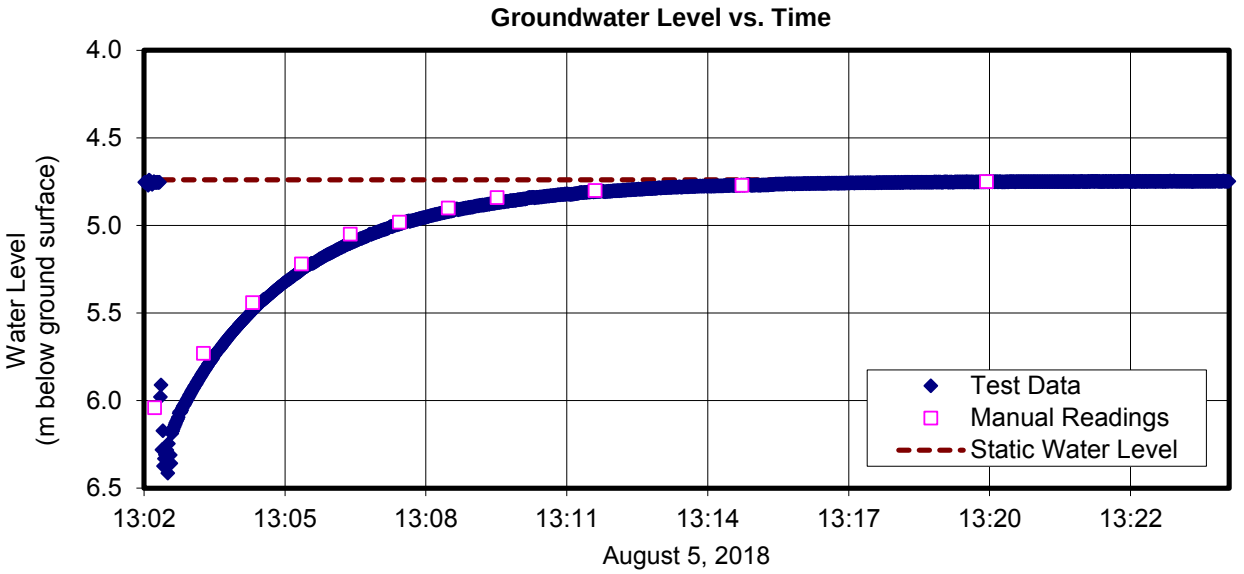
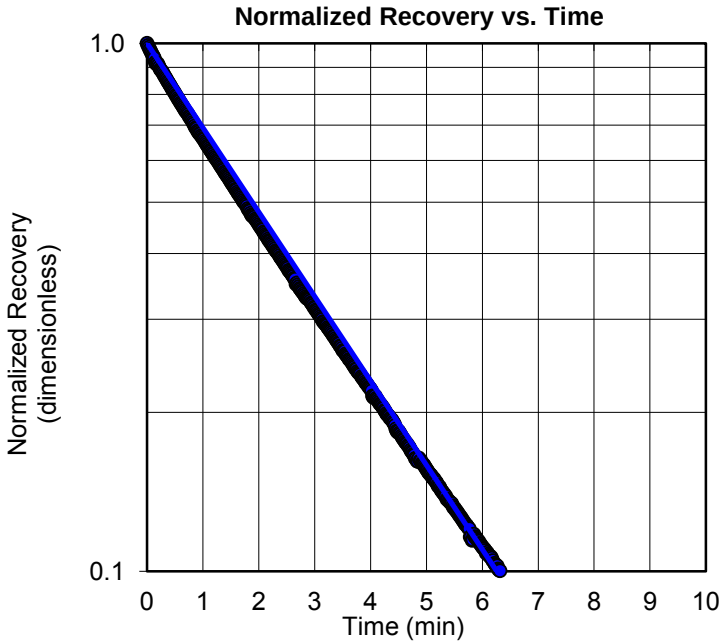
In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-14A

FIGURE E21





Test Interval (below ground surface)

9.6 m to 12.6 m

Static Water Level (below ground surface)

4.74 m

Test Interval (L) = 3.05 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 1.00 t_1 = 0 min

h_2/H_0 = 0.11 t_2 = 6 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{3E-6 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

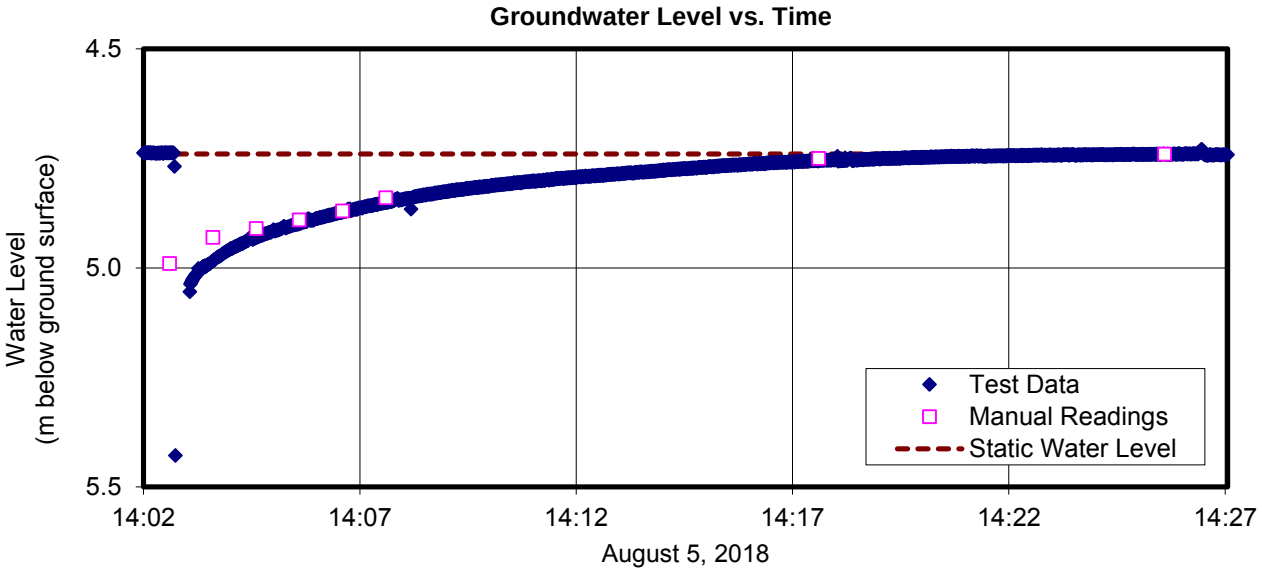
DESIGN: KL

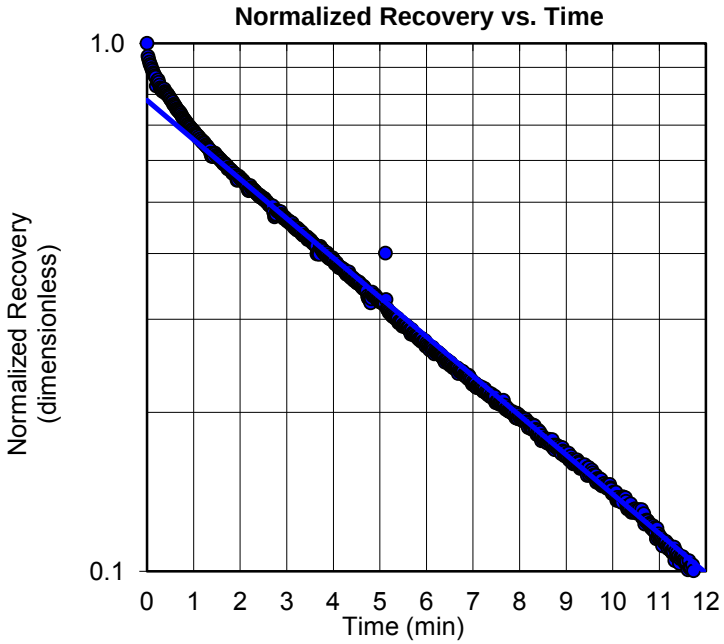
CHECK: RA

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-14B

FIGURE E22





Test Interval (below ground surface)

4.7 m to 6.4 m

Static Water Level (below ground surface)

4.74 m

Test Interval (L) = 1.69 m

Eff. Well Radius (r) = 0.0338 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.78 t_1 = 0 min

h_2/H_0 = 0.14 t_2 = 10 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{3E-6 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

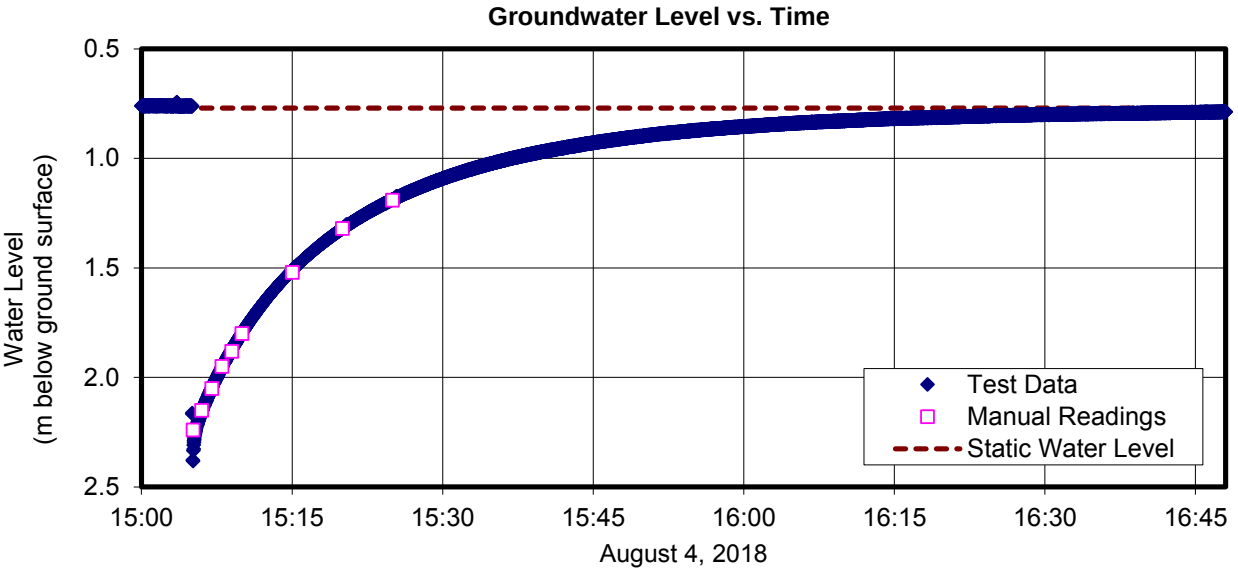
DESIGN: KL

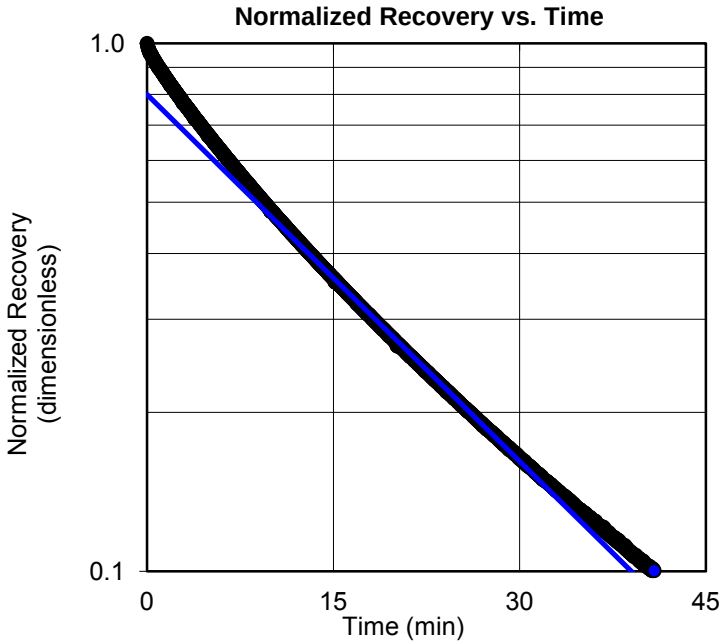
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-15A

FIGURE E23





Test Interval (below ground surface)

7.7 m to 10.8 m

Static Water Level (below ground surface)

0.77 m

Test Interval (L) = 3.05 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.80 t_1 = 0 min

h_2/H_0 = 0.10 t_2 = 39 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{4E-7 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

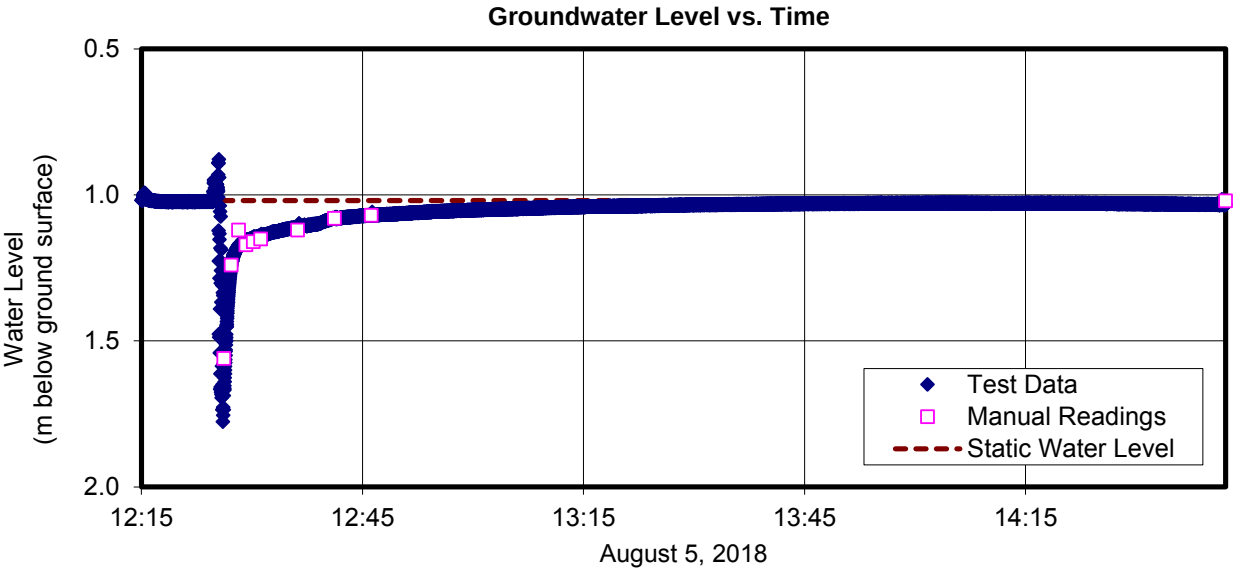
DESIGN: KL

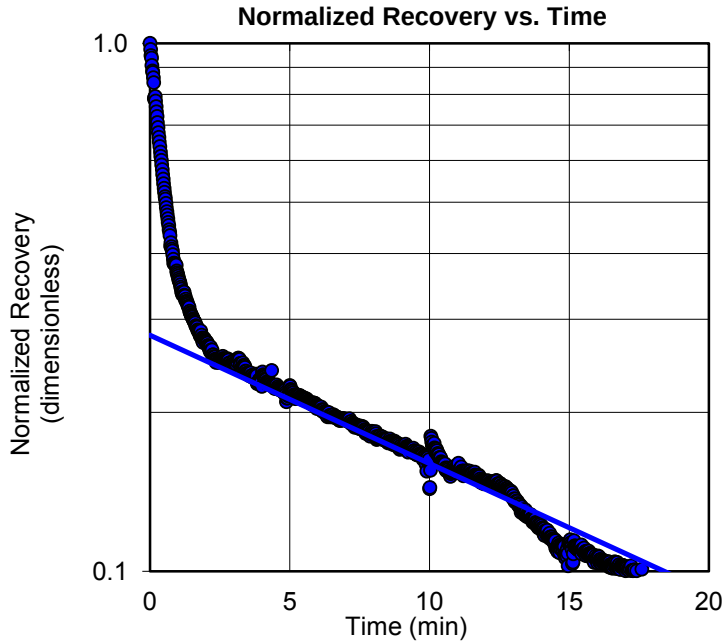
CHECK: RA

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-15B

FIGURE E24





Test Interval (below ground surface)

1.0 m to 4.1 m

Static Water Level (below ground surface)

1.02 m

Test Interval (L) = 3.05 m

Eff. Well Radius (r) = 0.0338 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.28 t_1 = 0 min

h_2/H_0 = 0.16 t_2 = 10 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{7E-7 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

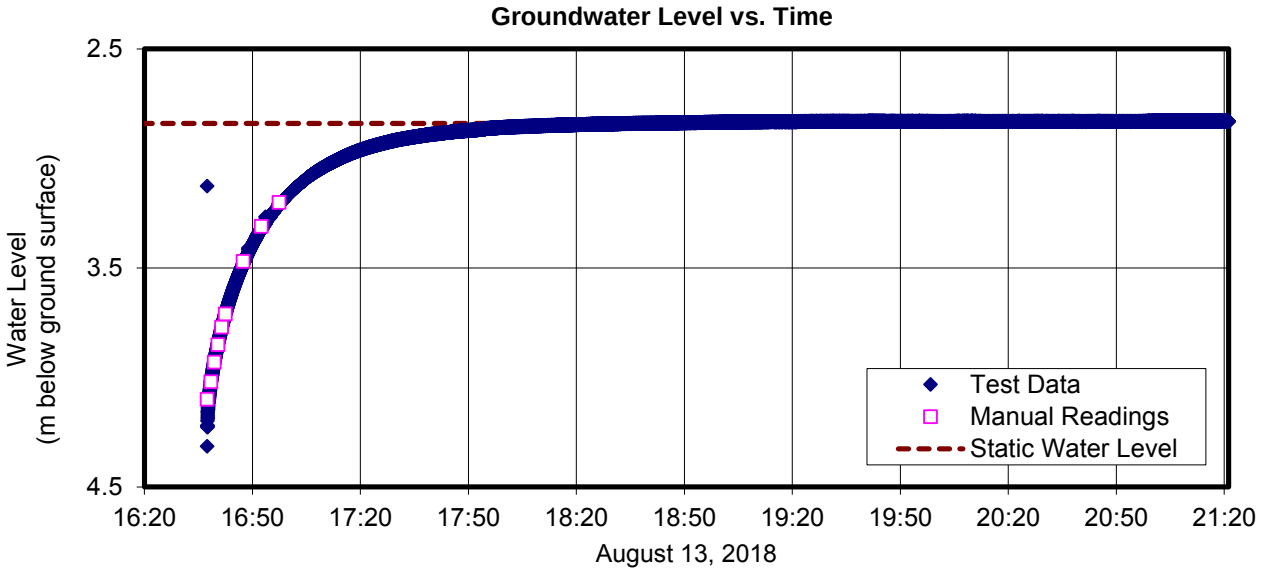
DESIGN: KL

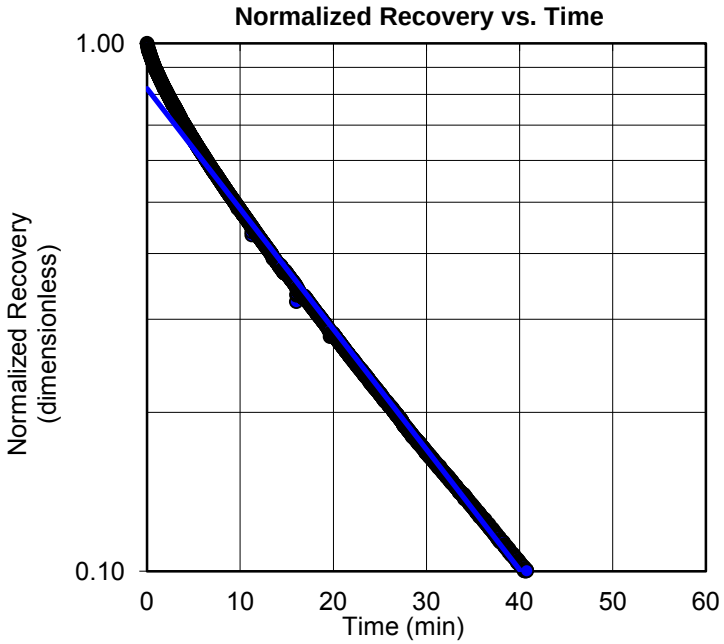
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-16A

FIGURE E25





Test Interval (below ground surface)

7.9 m to 10.9 m

Static Water Level (below ground surface)

2.84 m

Test Interval (L) = 3.05 m

Well Radius (r) = 0.0254 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.82 t_1 = 0 min

h_2/H_0 = 0.17 t_2 = 30 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{4E-7 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

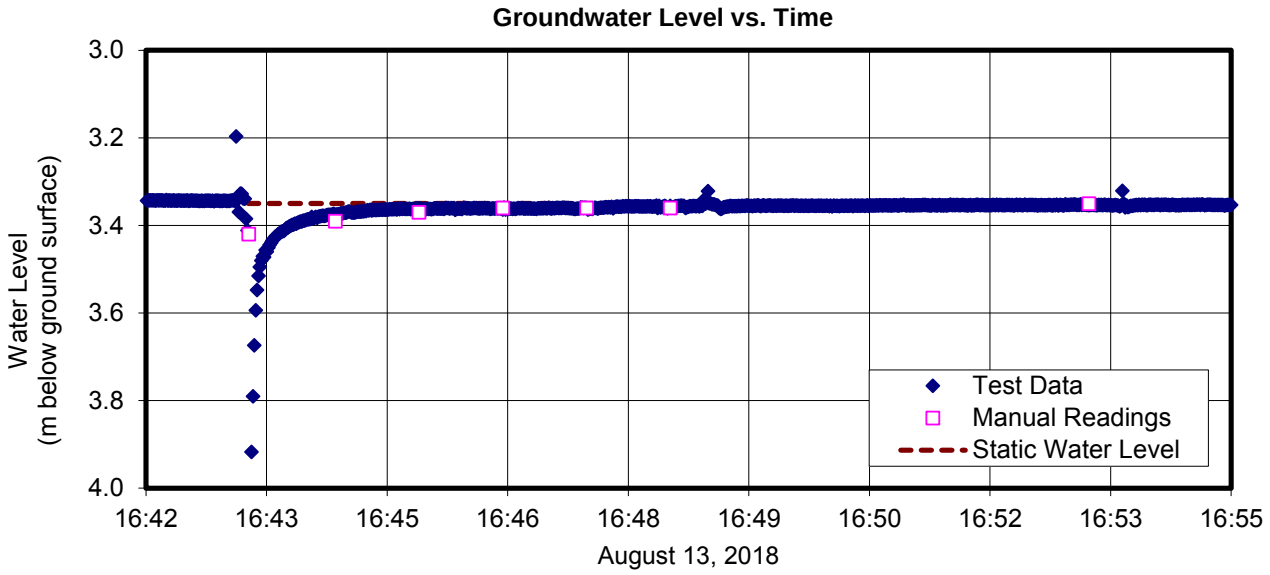
DESIGN: KL

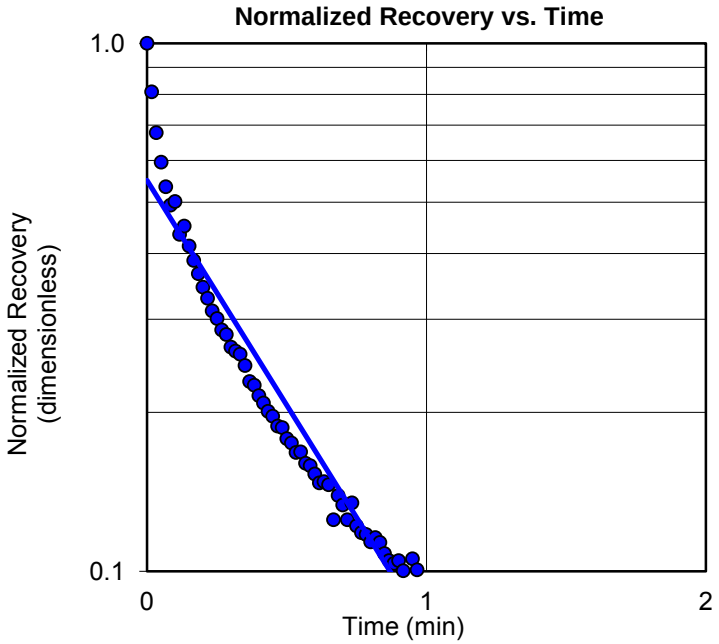
CHECK: MB

In-Situ Hydraulic Conductivity Test Report

Borehole FMS-HG18-16B

FIGURE E26





Test Interval (below ground surface)

3.4 m to 5.5 m

Static Water Level (below ground surface)

3.35 m

Test Interval (L) = 2.12 m

Eff. Well Radius (r) = 0.0338 m

Hole Radius (R) = 0.048 m

Points Used for Match Line

h_1/H_0 = 0.55 t_1 = 0 min

h_2/H_0 = 0.10 t_2 = 0.8 min

Hvorslev Analysis

$$\text{Hydraulic Conductivity (K)} = \frac{-(r^2) \cdot \ln(L/R)}{2 \cdot L} \cdot \frac{\ln(h_2/H_0) - \ln(h_1/H_0)}{t_2 - t_1} = \textbf{4E-5 m/s}$$

DATE: November 2018

PROJECT: 1895674

GOLDER

DESIGN: KL

CHECK: MB

APPENDIX F

Overburden Quality Results

Parameters	Units	Price Crustal Abundance	FMS-HG18-03A, SS2/SS4	FMS-HG18-04A, SS1B	FMS-HG18-05B, OS1	FMS-HG18-06A, OS2	FMS-HG18-07A, OS2	FMS-HG18-08A, SS1	FMS-HG18-09A, SS1A/SS1B/SS2	FMS-HG18-10A, SS3	FMS-HG18-11A, SS2	FMS-HG18-13A, OS3	FMS-HG18-14A, SS1	FMS-HG18-16A, SS2
Sample ID														
Borehole			FMS-HG18-03A	FMS-HG18-04A	FMS-HG18-05A	FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-08A	FMS-HG18-09A	FMS-HG18-10A	FMS-HG18-11A	FMS-HG18-13A	FMS-HG18-14A	FMS-HG18-16A
Depth (m)			0.61 - 1.71	0.05 – 0.61	0.00 – 0.61	0.61 – 1.22	0.61 – 1.22	0.00 – 0.61	0.00 - 0.65	1.45 – 2.03	0.61 – 0.97	1.22 – 1.60	0.00 – 0.61	0.61 – 1.22
Aluminum	ppm	*82300*	16000	10000	18000	16000	15000	17000	16000	19000	13000	16000	20000	16000
Antimony	ppm	*0.2*	< 0.8	< 0.8	< 0.8	**1.2**	< 0.8	< 0.8	**1.6**	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Arsenic	ppm	*1.8*	**17**	4.9	**170**	**270**	**53**	**14**	**3000**	**19**	**30**	5.3	**770**	3.0
Barium	ppm	*425*	94	64	52	48	67	54	60	51	66	77	66	96
Beryllium	ppm	*3*	0.32	0.18	0.29	0.35	0.28	0.35	0.34	0.36	0.33	0.19	0.35	0.22
Bismuth	ppm	*0.0085*	**0.31**	**0.15**	**0.49**	**1.2**	**0.30**	**0.21**	**0.46**	**0.29**	**0.24**	**0.26**	**1.0**	**0.15**
Cadmium	ppm	*3*	0.058	0.048	0.053	0.096	0.034	0.052	0.041	0.038	0.052	0.045	0.084	0.027
Calcium	ppm	*41500*	1400	1300	930	1400	1200	1000	1100	1100	600	2000	780	1100
Chromium	ppm	*102*	27	16	30	52	31	29	28	48	21	55	37	32
Cobalt	ppm	*25*	12	7	11	10	13	13	8.9	15	12	13	13	10
Copper	ppm	*60*	29	5.6	28	26	21	18	27	36	23	37	27	10
Iron	ppm	*56300*	29000	22000	34000	34000	37000	35000	33000	40000	26000	30000	39000	30000
Lead	ppm	*14*	8	11	10	**260**	10	7	12	7	9	7	21	6
Lithium	ppm	*20*	26	13	30	19	31	23	29	32	21	24	27	29
Magnesium	ppm	*23300*	8200	4300	8800	6300	8000	7900	7600	9900	5200	8900	9300	7800
Manganese	ppm	*950*	480	400	390	340	520	370	300	400	720	400	430	400
Molybdenum	ppm	*1.2*	0.7	0.6	0.5	0.7	0.5	0.6	0.7	0.5	0.6	0.4	0.7	0.6
Nickel	ppm	*84*	29	11	27	21	24	34	21	24	23	32	27	24
Potassium	ppm	*20850*	5800	1800	2900	1800	3500	1700	3700	3300	2200	5900	3700	5600
Selenium	ppm	*0.05*	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Silver	ppm	*0.075*	0.260	0.250	0.047	0.280	0.033	0.023	0.056	0.028	0.034	0.043	0.260	0.058
Strontium	ppm	*370*	11	13	5.5	9.3	6.9	6.4	6.3	5.0	6.8	17	5.6	7.6
Thallium	ppm	*0.85*	0.23	0.09	0.14	0.24	0.18	0.09	0.18	0.21	0.12	0.27	0.18	0.24
Tin	ppm	*2.3*	< 0.5	< 0.5	< 0.5	1.0	0.5	< 0.5	0.6	< 0.5	< 0.5	0.5	0.5	0.6
Titanium	ppm	*5650*	820	600	500	500	710	530	630	620	420	970	590	1100
Uranium	ppm	*2.7*	0.69	0.47	0.63	0.55	0.80	0.86	0.65	1.2	0.82	0.79	0.69	0.59
Vanadium	ppm	*120*	26	25	28	31	34	31	29	28	20	29	36	33
Yttrium	ppm	*33*	9.2	2.8	9.7	8.4	9.0	9.0	7.0	11	6.3	12	6.9	5.6
Zinc	ppm	*70*	65	43	70	89	64	57	55	81	47	65	75	56

Notes:

- Price Crustal Abundance taken from: Price, W.A., 1997. Draft Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Minesites in British Columbia, Ministry of Energy and Mines. p. 159.

0.7	- Denotes values greater than five times the Price Crustal Abundance.
0.7	- Denotes values greater than ten times the Price Crustal Abundance.

Sample ID	Borehole	Depth (m)	Paste pH	Total Sulphur	Sulphide Sulphur	Sulphate Sulphur	Total Carbon	Carbonate	CO_3-NP[1]	NP[2]	AP[3]	Net NP[4]	Net CO_3-NP[5]	NPR[6]	CO_3-NPR[7]
			s.u.	%	%	%	%	%	t $CaCO_3$ /1000 t					ratio	ratio
FMS-HG18-06A, OS2	FMS-HG18-06A	0.61 – 1.22	5.7	0.121	0.07	0.05	2.09	2.79	47	-0.8	2.2	-3.0	44	-0.4	21
FMS-HG18-09A, SS1A/SS1B/SS2	FMS-HG18-09A	0.00 - 0.65	6.1	0.169	0.12	0.05	1.15	1.28	21	1.3	3.8	-2.5	18	0.3	5.7
FMS-HG18-10A, SS3	FMS-HG18-10A	1.45 – 2.03	7.0	0.017	< 0.02	< 0.02	0.06	0.075	1.3	2.9	0.3	2.6	0.9	9.3	4.0
FMS-HG18-11A, SS2	FMS-HG18-11A	0.61 – 0.97	7.3	0.005	< 0.02	< 0.02	0.15	< 0.025	0.1	1.3	0.3	1.0	-0.2	4.2	0.3
FMS-HG18-13A, OS3	FMS-HG18-13A	1.22 – 1.60	8.2	< 0.005	< 0.02	< 0.02	0.04	< 0.025	0.1	4.0	0.3	3.7	-0.2	13	0.3
FMS-HG18-14A, SS1	FMS-HG18-14A	0.00 – 0.61	6.5	0.078	0.05	0.03	0.57	0.405	6.8	2.3	1.6	0.7	5.2	1.5	4.3

Notes:

(1) Carbonate neutralization potential (CO_3-NP) = (Carbonate (CO_3) /60.01) * 100.09 * 10

(2) Neutralization potential (NP) is determined directly from Sobek method (Sobek, 1978).

(3) Acid potential (AP) = Sulphide Sulphur (%) x 31.25

(4) Net neutralization potential = NP - AP

(4) Net carbonate neutralization potential = CO_3-NP - AP

(6) Net Potential Ratio (NPR) = NP / AP

(7) Carbonate NPR (CO_3-NPR) = CO_3-NP / AP

Parameters	Units	CCME CEQG [a] Long Term						
Sample ID			FMS-HG18-06A, OS2	FMS-HG18-09A, SS1A/SS1B/SS2	FMS-HG18-10A, SS3	FMS-HG18-11A, SS2	FMS-HG18-13A, OS3	FMS-HG18-14A, SS1
Borehole			FMS-HG18-06A	FMS-HG18-09A	FMS-HG18-10A	FMS-HG18-11A	FMS-HG18-13A	FMS-HG18-14A
Depth (m)			0.61 – 1.22	0.00 - 0.65	1.45 – 2.03	0.61 – 0.97	1.22 – 1.60	0.00 – 0.61
pH	units	*6.5-9.0*	**5.6**	**5.4**	**5.2**	6.6	7.0	7.3
Conductivity	µS/cm	-	130	148	180	37	27	452
Alkalinity	mg/L as $CaCO_3$	-	< 2	< 2	< 2	2	5	30
Chloride	mg/L	*120*	2.0	1.0	1.0	2.0	1.0	11
Nitrate	mg/L as N	0.05	**0.94**	**0.96**	< 0.6	< 0.6	< 0.6	**8.4**
Sulphate	mg/L	-	47	53	72	8.0	4.0	140
Aluminum	mg/L	*0.005 - 0.1* [b]	**0.031**	**0.046**	**0.017**	0.008	**0.384**	0.007
Antimony	mg/L	-	0.0004	0.0005	< 0.0002	< 0.0002	0.0003	0.0006
Arsenic	mg/L	*0.005*	**0.0101**	**0.0576**	0.0015	0.0004	0.0015	**0.0154**
Barium	mg/L	-	0.0449	0.0171	0.0570	0.0033	0.0028	0.0194
Beryllium	mg/L	-	0.000029	0.000041	0.000071	< 0.000007	0.000013	< 0.000007
Bismuth	mg/L	-	< 0.000007	< 0.000007	< 0.000007	< 0.000007	0.000016	< 0.000007
Boron	mg/L	*1.5*	0.017	0.018	0.007	0.006	0.005	0.016
Cadmium	mg/L	*0.09*	0.00042	0.00016	0.00035	0.00001	0.00001	0.00009
Calcium	mg/L	-	9.48	4.80	5.28	0.28	0.14	62.6
Chromium	mg/L	*0.001* [c]	0.00013	0.00017	< 0.00003	0.00003	0.00061	0.00007
Cobalt	mg/L	-	0.01170	0.00826	0.16800	0.00016	0.00052	0.00471
Copper	mg/L	*0.002* [d]	**0.00436**	0.00152	0.00050	0.00029	**0.00363**	0.00106
Iron	mg/L	*0.3*	0.008	0.047	0.100	< 0.007	**0.418**	< 0.007
Lead	mg/L	*0.001* [d]	**0.02091**	0.00008	0.00006	< 0.00001	0.00059	0.00034
Lithium	mg/L	-	0.0059	0.0138	0.0046	0.0005	0.0005	0.0013
Magnesium	mg/L	-	2.21	2.49	5.94	0.33	0.13	11.1
Manganese	mg/L	-	0.720	0.381	3.710	0.145	0.015	0.707
Mercury	mg/L	*0.000026*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.073*	0.00011	0.00006	0.00007	0.00035	0.00478	0.00049
Nickel	mg/L	*0.025* [d]	0.0199	0.0126	**0.1640**	0.0003	0.0009	0.0190
Potassium	mg/L	-	4.77	15.1	14.3	2.82	3.44	4.85
Selenium	mg/L	*0.001*	0.00015	0.00024	0.00019	0.00025	0.00007	0.00071
Silicon	mg/L	-	5.99	7.28	4.67	2.93	2.92	2.32
Silver	mg/L	*0.0001*	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Sodium	mg/L	-	5.68	5.48	3.58	3.17	3.07	8.02
Strontium	mg/L	-	0.077	0.023	0.036	0.003	0.002	0.117
Thallium	mg/L	*0.0008*	0.00009	0.00009	0.00012	0.00002	0.00001	0.00003
Tin	mg/L	-	0.00003	0.00006	0.00005	0.00002	0.00007	0.00004
Titanium	mg/L	-	0.00024	0.00016	< 0.00005	0.00035	0.01590	0.00006
Uranium	mg/L	*0.015*	0.00003	0.00001	0.00005	0.00001	0.00012	0.00002
Vanadium	mg/L	-	0.0001	0.0002	0.0001	0.0002	0.0010	0.0001
Zinc	mg/L	*0.007* [e]	**0.224**	**0.016**	0.003	< 0.002	< 0.002	**0.008**

Notes:

0.1 − Denotes a value that is greater than the CCME Guideline for the Protection of Freshwater Aquatic Life

a) Canadian Council of Ministers of the Environment (1999 updated in 2018). Canadian Environmental Quality Guidelines for the Protection of Aquatic Life.

b) Guideline is variable and dependent on pH values. Refer to CCME (2018) for method of calculation.

c) Chromium guideline for Cr (VI)

d) Guideline is variable and dependent on pH values. Refer to CCME (2018) for method of calculation. 10 mg/L $CaCO_3$ assumed for screening.

e) CEQG for zinc is for dissolved metal fraction.

A dash "-" indicates that results were not reported for this parameter.

APPENDIX G

Groundwater Quality Results

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES
201 Brownlow Avenue, Suite 26
DARTMOUTH, NS B3B 1W2
(902) 466-1668

ATTENTION TO: Glen Merkley

PROJECT: 1895674

AGAT WORK ORDER: 18X382529

MISCELLANEOUS ANALYSIS REVIEWED BY: Kelly Hogue, B.Sc, P.Chem, Operations Manager

TRACE ORGANICS REVIEWED BY: Amy Hunter, Trace Organics Supervisor, B.Sc.

WATER ANALYSIS REVIEWED BY: Michelle Hildebrand, Inorganics Analyst, B.Sc, P.Chem

DATE REPORTED: Oct 04, 2018

PAGES (INCLUDING COVER): 41

VERSION*: 3

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

*NOTES
VERSION 3:Version 2.0 supersedes version 1.0 - Complete Report

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA)
Western Enviro-Agricultural Laboratory Association (WEALA)
Environmental Services Association of Alberta (ESAA)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.

Results relate only to the items tested. Results apply to samples as received.
All reportable information as specified by ISO 17025:2017 is available from AGAT Laboratories upon request

AGAT Laboratories
11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Subcontracted Data Received

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

		SAMPLE DESCRIPTION:		FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A	FMS-HG18-05B
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-09-05	2018-09-05	2018-09-05	2018-09-05	2018-09-06	2018-09-06	2018-09-05	2018-09-06
Parameter	Unit	G / S	RDL	9528572	9528577	9528578	9528579	9528580	9528581	9528582	9528583
Subcontracted Data				Y	Y	Y	Y	Y	Y	Y	Y

		SAMPLE DESCRIPTION:		FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-10A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-09-05	2018-09-06	2018-09-06	2018-09-05	2018-09-05	2018-09-08	2018-09-06	2018-09-05
Parameter	Unit	G / S	RDL	9528584	9528585	9528586	9528587	9528604	9528605	9528606	9528607
Subcontracted Data				Y	Y	Y	Y	Y	Y	Y	Y

		SAMPLE DESCRIPTION:		FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-09-05	2018-09-04	2018-09-04	2018-09-05	2018-09-05	2018-09-05	2018-09-05	2018-09-06
Parameter	Unit	G / S	RDL	9528608	9528609	9528610	9528611	9528612	9528613	9528614	9528615
Subcontracted Data				Y	Y	Y	Y	Y	Y	Y	Y

		SAMPLE DESCRIPTION:		FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A	DUP-B	DUP-C
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-09-06	2018-09-06	2018-09-06	2018-09-05	2018-09-05	2018-09-06
Parameter	Unit	G / S	RDL	9528771	9528772	9528773	9528776	9528777	9528778
Subcontracted Data				Y	Y	Y	Y	Y	Y

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: Kelly Hogue

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AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

				SAMPLE DESCRIPTION:	FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2018-09-05	2018-09-05	2018-09-05	2018-09-05	2018-09-06	2018-09-06	2018-09-05
Parameter	**Unit**	**G / S: A**	**G / S: B**	**RDL**	**9528572**	**9528577**	**9528578**	**9528579**	**9528580**	**9528581**	**9528582**
Benzene	mg/L	0.005	2.1	0.001	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Resemblance Comment					NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32					Y	Y	Y	Y	Y	Y	Y
Surrogate	**Unit**	**Acceptable Limits**									
Isobutylbenzene - EPH	%	70-130			111	99	89	100	101	86	109
Isobutylbenzene - VPH	%	70-130			116	108	117	117	129	104	104
n-Dotriacontane - EPH	%	70-130			118	102	94	102	109	104	119

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

					SAMPLE DESCRIPTION:	FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2018-09-06	2018-09-05	2018-09-06	2018-09-06	2018-09-05	2018-09-05	2018-09-08
Parameter	**Unit**	**G / S: A**	**G / S: B**	**RDL**		**9528583**	**9528584**	**9528585**	**9528586**	**9528587**	**9528604**	**9528605**
Benzene	mg/L	0.005	2.1	0.001		<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001		<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001		<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002		<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	0.1		<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Resemblance Comment						NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32						Y	Y	Y	Y	Y	Y	Y
Surrogate	**Unit**	**Acceptable Limits**										
Isobutylbenzene - EPH	%	70-130				84	108	87	117	107	113	110
Isobutylbenzene - VPH	%	70-130				110	114	112	113	115	110	111
n-Dotriacontane - EPH	%	70-130				94	111	104	118	123	N/A	96

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

SAMPLE DESCRIPTION:					FMS-HG18-09B	FMS-HG18-10A	FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-09-06	2018-09-05	2018-09-05	2018-09-04	2018-09-04	2018-09-05	2018-09-05
Parameter	**Unit**	**G / S: A**	**G / S: B**	**RDL**	**9528606**	**9528607**	**9528608**	**9528609**	**9528610**	**9528611**	**9528612**
Benzene	mg/L	0.005	2.1	0.001	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Resemblance Comment					NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32					Y	Y	Y	Y	Y	Y	Y
Surrogate	**Unit**	**Acceptable Limits**									
Isobutylbenzene - EPH	%	70-130			102	115	103	98	93	88	74
Isobutylbenzene - VPH	%	70-130			113	113	114	113	111	120	112
n-Dotriacontane - EPH	%	70-130			110	123	120	117	126	125	122

Certified By:

Results relate only to the items tested. Results apply to samples as received.

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FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

SAMPLE DESCRIPTION:					FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15A	FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-09-05	2018-09-05	2018-09-06	2018-09-06	2018-09-06	2018-09-06	2018-09-05
Parameter	**Unit**	**G / S: A**	**G / S: B**	**RDL**	**9528613**	**9528614**	**9528615**	**9528771**	**9528772**	**9528773**	**9528776**
Benzene	mg/L	0.005	2.1	0.001	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Resemblance Comment					NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32					Y	Y	Y	Y	Y	Y	Y
Surrogate	**Unit**	**Acceptable Limits**									
Isobutylbenzene - EPH	%	70-130			92	116	111	98	126	81	81
Isobutylbenzene - VPH	%	70-130			118	115	113	113	118	116	112
n-Dotriacontane - EPH	%	70-130			110	117	120	108	96	120	125

Certified By:

Results relate only to the items tested. Results apply to samples as received.

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

					SAMPLE DESCRIPTION:	DUP-B	DUP-C
					SAMPLE TYPE:	Water	Water
					DATE SAMPLED:	2018-09-05	2018-09-06
Parameter	**Unit**	**G / S: A**	**G / S: B**	**RDL**		**9528777**	**9528778**
Benzene	mg/L	0.005	2.1	0.001		<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001		<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001		<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002		<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01		<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05		<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10		<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1		<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	0.1		<0.1[<B]	<0.1[<B]
Resemblance Comment						NR	NR
Return to Baseline at C32						Y	Y
Surrogate	**Unit**	**Acceptable Limits**					
Isobutylbenzene - EPH	%	70-130				71	74
Isobutylbenzene - VPH	%	70-130				116	98
n-Dotriacontane - EPH	%	70-130				126	123

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Canadian Drinking Water Quality - updated 2017-05, B Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9528572-9528778 Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

Results relate only to the items tested. Results apply to samples as received.

AGAT Laboratories
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CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Analyses Inorganiques

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

		SAMPLE DESCRIPTION:		FMS-HG18-07B	FMS-HG18-15B	FMS-HG18-16B
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2018-09-06	2018-09-06	2018-09-06
Parameter	Unit	G / S	RDL	9528586	9528771	9528773
Cyanures totaux	mg/L - CN		0.005	<0.005	<0.005	<0.005

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9528586-9528773 Une LDR plus élevée indique qu'une dilution a été effectuée afin de réduire la concentration des analytes ou de réduire l'interférence de la matrice.

Analysis performed at AGAT Montreal (unless marked by *)

Certified By: Michelle Hildebrand

Results relate only to the items tested. Results apply to samples as received.

AGAT Laboratories

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Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
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Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Free Cyanide (Water)

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

		SAMPLE DESCRIPTION:		FMS-HG18-07B	FMS-HG18-15B	FMS-HG18-16B
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2018-09-06	2018-09-06	2018-09-06
Parameter	Unit	G / S	RDL	9528586	9528771	9528773
Cyanide, Free	mg/L		0.002	<0.002	<0.002	<0.002

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: Michelle Hildebrand

Results relate only to the items tested. Results apply to samples as received.

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Mercury Analysis in Water (Dissolved)

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

				SAMPLE DESCRIPTION:	FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2018-09-05	2018-09-05	2018-09-05	2018-09-05	2018-09-06	2018-09-06	2018-09-05
Parameter	Unit	G / S: A	G / S: B	RDL	9528572	9528577	9528578	9528579	9528580	9528581	9528582
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

				SAMPLE DESCRIPTION:	FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2018-09-06	2018-09-05	2018-09-06	2018-09-06	2018-09-05	2018-09-05	2018-09-08
Parameter	Unit	G / S: A	G / S: B	RDL	9528583	9528584	9528585	9528586	9528587	9528604	9528605
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

				SAMPLE DESCRIPTION:	FMS-HG18-09B	FMS-HG18-10A	FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2018-09-06	2018-09-05	2018-09-05	2018-09-04	2018-09-04	2018-09-05	2018-09-05
Parameter	Unit	G / S: A	G / S: B	RDL	9528606	9528607	9528608	9528609	9528610	9528611	9528612
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

				SAMPLE DESCRIPTION:	FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15A	FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2018-09-05	2018-09-05	2018-09-06	2018-09-06	2018-09-06	2018-09-06	2018-09-05
Parameter	Unit	G / S: A	G / S: B	RDL	9528613	9528614	9528615	9528771	9528772	9528773	9528776
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

				SAMPLE DESCRIPTION:	DUP-B	DUP-C
				SAMPLE TYPE:	Water	Water
				DATE SAMPLED:	2018-09-05	2018-09-06
Parameter	Unit	G / S: A	G / S: B	RDL	9528777	9528778
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Canadian Drinking Water Quality - updated 2017-05, B Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: Michelle Hildebrand

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Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Mercury Analysis in Water (Total)

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

					SAMPLE DESCRIPTION:	FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2018-09-05	2018-09-05	2018-09-05	2018-09-05	2018-09-06	2018-09-06	2018-09-05
Parameter	Unit	G / S: A	G / S: B	RDL		9528572	9528577	9528578	9528579	9528580	9528581	9528582
Total Mercury	ug/L	1	0.026	0.016		<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

					SAMPLE DESCRIPTION:	FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2018-09-06	2018-09-05	2018-09-06	2018-09-06	2018-09-05	2018-09-05	2018-09-08
Parameter	Unit	G / S: A	G / S: B	RDL		9528583	9528584	9528585	9528586	9528587	9528604	9528605
Total Mercury	ug/L	1	0.026	0.016		<0.016[<B]	0.028[B-A]	<0.016[<B]	0.024[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

					SAMPLE DESCRIPTION:	FMS-HG18-09B	FMS-HG18-10A	FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2018-09-06	2018-09-05	2018-09-05	2018-09-04	2018-09-04	2018-09-05	2018-09-05
Parameter	Unit	G / S: A	G / S: B	RDL		9528606	9528607	9528608	9528609	9528610	9528611	9528612
Total Mercury	ug/L	1	0.026	0.016		<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	0.028[B-A]	<0.016[<B]	<0.016[<B]

					SAMPLE DESCRIPTION:	FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15A	FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2018-09-05	2018-09-05	2018-09-06	2018-09-06	2018-09-06	2018-09-06	2018-09-05
Parameter	Unit	G / S: A	G / S: B	RDL		9528613	9528614	9528615	9528771	9528772	9528773	9528776
Total Mercury	ug/L	1	0.026	0.016		<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

					SAMPLE DESCRIPTION:	DUP-B	DUP-C
					SAMPLE TYPE:	Water	Water
					DATE SAMPLED:	2018-09-05	2018-09-06
Parameter	Unit	G / S: A	G / S: B	RDL		9528777	9528778
Total Mercury	ug/L	1	0.026	0.016		<0.016[<B]	<0.016[<B]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Canadian Drinking Water Quality - updated 2017-05, B Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: Michelle Hildebrand

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Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

SAMPLE DESCRIPTION:					FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-09-05	2018-09-05	2018-09-05	2018-09-05	2018-09-06	2018-09-06	2018-09-05
Parameter	Unit	G / S: A	G / S: B	RDL	9528572	9528577	9528578	9528579	9528580	9528581	9528582
pH		7.0-10.5 OG			8.03	7.06	7.45	6.74	8.16	7.03	6.53
Reactive Silica as SiO2	mg/L			0.5	8.5	8.8	9.2	6.3	8.1	6.1	6.7
Chloride	mg/L	250 AO		1	3	4	2	2	2	3	4
Fluoride	mg/L	1.5		0.12	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	0.18[<A]	<0.12[<A]	<0.12[<A]
Sulphate	mg/L	500 AO		2	8	3	3	<2	6	<2	2
Alkalinity	mg/L			5	69	32	28	7	140	38	10
True Color	TCU	15 AO		5	10	<5	<5	<5	<5	<5	<5
Turbidity	NTU	0.1-1		0.1	9.4	16.1	7.4	1.5	1.6	31.1	3.0
Electrical Conductivity	umho/cm			1	172	90	77	32	288	89	54
Nitrate + Nitrite as N	mg/L			0.05	0.06	0.10	0.13	0.26	0.07	<0.05	0.33
Nitrate as N	mg/L	10		0.05	0.06[<A]	0.10[<A]	0.13[<A]	0.26[<A]	0.07[<A]	<0.05[<A]	0.33[<A]
Nitrite as N	mg/L	1.0		0.05	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Ammonia as N	mg/L			0.03	0.04	0.05	0.03	0.04	0.07	0.03	<0.03
Total Organic Carbon	mg/L			0.5	<0.5	<0.5	0.9	0.6	<0.5	<0.5	0.6
Ortho-Phosphate as P	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L	200 AO		0.1	6.5	4.4	4.9	2.7	37.9	7.4	2.6
Dissolved Potassium	mg/L			0.1	1.6	4.7	1.1	0.5	2.4	1.3	2.7
Dissolved Calcium	mg/L			0.1	24.3	3.4	7.1	1.4	20.8	2.7	3.7
Dissolved Magnesium	mg/L			0.1	2.1	2.4	0.6	0.3	3.3	0.6	0.8
Bicarb. Alkalinity (as CaCO3)	mg/L			5	69	32	28	7	140	38	10
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L			5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L	500 AO		1	87	48	36	12	157	39	23
Hardness	mg/L				69.3	18.4	20.2	4.7	65.5	9.2	12.5
Langelier Index (@20C)	NA				-0.33	-2.46	-1.79	-3.77	0.02	-2.51	-3.43
Langelier Index (@ 4C)	NA				-0.65	-2.78	-2.11	-4.09	-0.30	-2.83	-3.75
Saturation pH (@ 20C)	NA				8.36	9.52	9.24	10.5	8.14	9.54	9.96
Saturation pH (@ 4C)	NA				8.68	9.84	9.56	10.8	8.46	9.86	10.3
Anion Sum	me/L				1.64	0.82	0.69	0.21	2.99	0.84	0.38
Cation sum	me/L				1.72	0.92	0.65	0.23	3.04	0.58	0.43

Certified By: Michelle Hildebrand

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Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

SAMPLE DESCRIPTION:					FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-09-05	2018-09-05	2018-09-05	2018-09-05	2018-09-06	2018-09-06	2018-09-05
Parameter	Unit	G / S: A	G / S: B	RDL	9528572	9528577	9528578	9528579	9528580	9528581	9528582
% Difference/ Ion Balance (NS)	%				2.5	5.5	3.0	4.2	0.8	18.6	6.9
Dissolved Aluminum	ug/L	100 OG AO	5	5	11[>B]	15[>B]	<5[<B]	<5[<B]	7[>B]	<5[<B]	7[>B]
Dissolved Antimony	ug/L	6	20	2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Arsenic	ug/L	10	5.0	2	9[B-A]	<2[<B]	17[>A]	<2[<B]	47[>A]	<2[<B]	13[>A]
Dissolved Barium	ug/L	1000	1000	5	10[<A]	14[<A]	<5[<A]	<5[<A]	13[<A]	10[<A]	11[<A]
Dissolved Beryllium	ug/L		5.3	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Bismuth	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	5000	1200	5	14[<B]	12[<B]	5[<B]	5[<B]	20[<B]	7[<B]	6[<B]
Dissolved Cadmium	ug/L	5	0.01	0.017	<0.017[<A]	<0.017[<A]	<0.017[<A]	0.020[B-A]	0.020[B-A]	0.086[B-A]	0.018[B-A]
Dissolved Chromium	ug/L	50	-	1	1[<A]	1[<A]	<1[<A]	<1[<A]	2[<A]	1[<A]	1[<A]
Dissolved Cobalt	ug/L		10	1	<1[<B]	9[<B]	<1[<B]	3[<B]	<1[<B]	5[<B]	<1[<B]
Dissolved Copper	ug/L	1000 AO	2	1	<1[<B]	<1[<B]	<1[<B]	3[>B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Iron	ug/L	300 AO	300	50	<50[<B]	3440[>B]	<50[<B]	<50[<B]	<50[<B]	<50[<B]	<50[<B]
Dissolved Lead	ug/L	10	1	0.5	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]
Dissolved Manganese	ug/L	50 AO	820	2	112[<B]	3080[>B]	26[<B]	136[<B]	306[<B]	1010[>B]	9[<B]
Dissolved Molybdenum	ug/L		73	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	8[<B]	<2[<B]	<2[<B]
Dissolved Nickel	ug/L		25	2	2[<B]	6[<B]	<2[<B]	19[<B]	<2[<B]	6[<B]	3[<B]
Dissolved Phosphorus	mg/L			0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	50	1.0	1	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Silver	ug/L		0.1	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Strontium	ug/L		21000	5	174[<B]	24[<B]	34[<B]	13[<B]	136[<B]	13[<B]	23[<B]
Dissolved Thallium	ug/L		0.8	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Tin	ug/L		-	2	<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Uranium	ug/L	20	300	0.1	2.4[<A]	<0.1[<A]	0.4[<A]	<0.1[<A]	9.5[<A]	<0.1[<A]	<0.1[<A]
Dissolved Vanadium	ug/L		6	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Zinc	ug/L	5000 AO	30	5	9[<B]	<5[<B]	<5[<B]	31[>B]	17[<B]	33[>B]	<5[<B]

Certified By: Michelle Hildebrand

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Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

SAMPLE DESCRIPTION:					FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-09-06	2018-09-05	2018-09-06	2018-09-06	2018-09-05	2018-09-05	2018-09-08
Parameter	Unit	G / S: A	G / S: B	RDL	9528583	9528584	9528585	9528586	9528587	9528604	9528605
pH		7.0-10.5 OG			6.87	7.04	7.96	6.54	7.65	7.36	7.72
Reactive Silica as SiO2	mg/L			0.5	6.3	5.8	14.2	7.2	7.7	7.0	12.1
Chloride	mg/L	250 AO		1	2	10	3	3	3	2	3
Fluoride	mg/L	1.5		0.12	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]
Sulphate	mg/L	500 AO		2	4	9	4	<2	3	5	4
Alkalinity	mg/L			5	25	38	89	13	50	35	76
True Color	TCU	15 AO		5	<5	28	<5	438	<5	<5	<5
Turbidity	NTU	0.1-1		0.1	94.6	6.5	1.4	14.6	11.5	9.2	4.0
Electrical Conductivity	umho/cm			1	87	134	202	54	124	97	174
Nitrate + Nitrite as N	mg/L			0.05	1.27	0.16	0.22	<0.05	0.21	0.10	<0.05
Nitrate as N	mg/L	10		0.05	1.27[<A]	0.16[<A]	0.22[<A]	<0.05[<A]	0.21[<A]	0.10[<A]	<0.05[<A]
Nitrite as N	mg/L	1.0		0.05	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Ammonia as N	mg/L			0.03	0.14	0.16	0.03	0.11	0.04	0.08	0.04
Total Organic Carbon	mg/L			0.5	1.3	0.8	<0.5	21.8	<0.5	<0.5	<0.5
Ortho-Phosphate as P	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L	200 AO		0.1	13.8	4.9	5.7	5.4	4.8	3.8	4.7
Dissolved Potassium	mg/L			0.1	3.7	1.4	1.8	0.9	0.9	2.0	1.2
Dissolved Calcium	mg/L			0.1	1.9	17.3	29.5	3.1	17.9	8.6	28.2
Dissolved Magnesium	mg/L			0.1	0.4	0.9	1.7	0.5	1.1	2.1	1.0
Bicarb. Alkalinity (as CaCO3)	mg/L			5	25	38	89	13	50	35	76
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L			5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L	500 AO		1	47	76	101	30	62	45	88
Hardness	mg/L				6.4	46.9	80.7	9.8	49.2	30.1	74.5
Langelier Index (@20C)	NA				-3.01	-1.72	-0.21	-3.39	-0.96	-1.71	-0.53
Langelier Index (@ 4C)	NA				-3.33	-2.04	-0.53	-3.71	-1.28	-2.03	-0.85
Saturation pH (@ 20C)	NA				9.88	8.76	8.17	9.93	8.61	9.07	8.25
Saturation pH (@ 4C)	NA				10.2	9.08	8.49	10.2	8.93	9.39	8.57
Anion Sum	me/L				0.73	1.24	1.96	0.34	1.16	0.87	1.69
Cation sum	me/L				0.84	1.53	1.93	0.87	1.22	0.84	1.75

Certified By: Michelle Hildebrand

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AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

SAMPLE DESCRIPTION:					FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-09-06	2018-09-05	2018-09-06	2018-09-06	2018-09-05	2018-09-05	2018-09-08
Parameter	Unit	G / S: A	G / S: B	RDL	9528583	9528584	9528585	9528586	9528587	9528604	9528605
% Difference/ Ion Balance (NS)	%				7.1	10.3	0.7	43.4	2.5	1.9	1.9
Dissolved Aluminum	ug/L	100 OG AO	5	5	24[>B]	26[>B]	5[B]	1060[>B]	<5[<B]	<5[<B]	<5[<B]
Dissolved Antimony	ug/L	6	20	2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Arsenic	ug/L	10	5.0	2	6[B-A]	169[>A]	35[>A]	24[>A]	3[<B]	<2[<B]	<2[<B]
Dissolved Barium	ug/L	1000	1000	5	7[<A]	19[<A]	9[<A]	17[<A]	<5[<A]	7[<A]	14[<A]
Dissolved Beryllium	ug/L		5.3	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Bismuth	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	5000	1200	5	10[<B]	8[<B]	13[<B]	9[<B]	8[<B]	12[<B]	7[<B]
Dissolved Cadmium	ug/L	5	0.01	0.017	0.034[B-A]	<0.017[<A]	<0.017[<A]	<0.017[<A]	<0.017[<A]	<0.017[<A]	<0.017[<A]
Dissolved Chromium	ug/L	50	-	1	1[<A]	1[<A]	2[<A]	3[<A]	1[<A]	1[<A]	1[<A]
Dissolved Cobalt	ug/L		10	1	3[<B]	<1[<B]	<1[<B]	2[<B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Copper	ug/L	1000 AO	2	1	2[B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	3[>B]	<1[<B]
Dissolved Iron	ug/L	300 AO	300	50	<50[<B]	8200[>B]	<50[<B]	7830[>B]	<50[<B]	<50[<B]	<50[<B]
Dissolved Lead	ug/L	10	1	0.5	<0.5[<B]	<0.5[<B]	<0.5[<B]	0.8[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]
Dissolved Manganese	ug/L	50 AO	820	2	157[<B]	835[>B]	646[<B]	321[<B]	40[<B]	296[<B]	597[<B]
Dissolved Molybdenum	ug/L		73	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Nickel	ug/L		25	2	9[<B]	<2[<B]	2[<B]	5[<B]	<2[<B]	4[<B]	3[<B]
Dissolved Phosphorus	mg/L			0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	50	1.0	1	<1[<B]	<1[<B]	<1[<B]	1[B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Silver	ug/L		0.1	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Strontium	ug/L		21000	5	14[<B]	35[<B]	164[<B]	17[<B]	59[<B]	24[<B]	91[<B]
Dissolved Thallium	ug/L		0.8	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Tin	ug/L		-	2	<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L			2	<2	<2	<2	10	<2	<2	<2
Dissolved Uranium	ug/L	20	300	0.1	<0.1[<A]	<0.1[<A]	1.3[<A]	0.4[<A]	0.4[<A]	<0.1[<A]	1.2[<A]
Dissolved Vanadium	ug/L		6	2	<2[<B]	<2[<B]	<2[<B]	4[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Zinc	ug/L	5000 AO	30	5	10[<B]	<5[<B]	<5[<B]	8[<B]	<5[<B]	<5[<B]	7[<B]

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CANADA B3B 1M2
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FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

SAMPLE DESCRIPTION:					FMS-HG18-09B	FMS-HG18-10A	FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-09-06	2018-09-05	2018-09-05	2018-09-04	2018-09-04	2018-09-05	2018-09-05
Parameter	Unit	G / S: A	G / S: B	RDL	9528606	9528607	9528608	9528609	9528610	9528611	9528612
pH		7.0-10.5 OG			6.78	7.49	6.63	6.91	6.89	6.99	6.47
Reactive Silica as SiO2	mg/L			0.5	10.7	6.5	4.1	8.8	8.4	7.1	4.6
Chloride	mg/L	250 AO		1	3	4	4	3	5	2	2
Fluoride	mg/L	1.5		0.12	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]
Sulphate	mg/L	500 AO		2	3	9	2	3	6	3	2
Alkalinity	mg/L			5	36	45	9	41	79	16	7
True Color	TCU	15 AO		5	<5	10	<5	<5	<5	10	<5
Turbidity	NTU	0.1-1		0.1	9.1	25.6	17.2	2.6	3.0	1.0	12.7
Electrical Conductivity	umho/cm			1	100	139	50	106	205	56	38
Nitrate + Nitrite as N	mg/L			0.05	0.19	0.28	0.19	0.15	0.08	0.18	0.10
Nitrate as N	mg/L	10		0.05	0.19[<A]	0.28[<A]	0.19[<A]	0.15[<A]	0.08[<A]	0.18[<A]	0.10[<A]
Nitrite as N	mg/L	1.0		0.05	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Ammonia as N	mg/L			0.03	0.04	0.04	0.06	0.03	0.04	0.05	0.04
Total Organic Carbon	mg/L			0.5	<0.5	<0.5	0.6	<0.5	<0.5	0.7	0.9
Ortho-Phosphate as P	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L	200 AO		0.1	8.3	15.2	2.9	3.9	4.6	3.6	5.8
Dissolved Potassium	mg/L			0.1	1.3	1.3	0.4	1.0	2.0	0.6	0.7
Dissolved Calcium	mg/L			0.1	4.0	16.1	3.9	9.9	29.1	3.5	1.1
Dissolved Magnesium	mg/L			0.1	0.7	0.9	0.6	0.9	2.0	0.6	0.5
Bicarb. Alkalinity (as CaCO3)	mg/L			5	36	45	9	41	79	16	7
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L			5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L	500 AO		1	44	75	20	48	111	24	17
Hardness	mg/L				12.9	43.9	12.2	28.4	80.9	11.2	4.8
Langelier Index (@20C)	NA				-2.61	-1.22	-3.34	-2.04	-1.34	-2.79	-4.15
Langelier Index (@ 4C)	NA				-2.93	-1.54	-3.66	-2.36	-1.66	-3.11	-4.47
Saturation pH (@ 20C)	NA				9.39	8.71	9.97	8.95	8.23	9.78	10.6
Saturation pH (@ 4C)	NA				9.71	9.03	10.3	9.27	8.55	10.1	10.9
Anion Sum	me/L				0.88	1.22	0.35	0.98	1.85	0.45	0.25
Cation sum	me/L				0.69	1.58	0.39	0.81	2.41	0.40	0.38

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Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

					SAMPLE DESCRIPTION:	FMS-HG18-09B	FMS-HG18-10A	FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2018-09-06	2018-09-05	2018-09-05	2018-09-04	2018-09-04	2018-09-05	2018-09-05
Parameter	**Unit**	**G / S: A**	**G / S: B**	**RDL**		**9528606**	**9528607**	**9528608**	**9528609**	**9528610**	**9528611**	**9528612**
% Difference/ Ion Balance (NS)	%					12.5	12.9	5.7	9.3	13.0	6.0	21.0
Dissolved Aluminum	ug/L	100 OG AO	5	5		<5[<B]	<5[<B]	36[>B]	<5[<B]	6[>B]	<5[<B]	15[>B]
Dissolved Antimony	ug/L	6	20	2		<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Arsenic	ug/L	10	5.0	2		<2[<B]	3[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Barium	ug/L	1000	1000	5		13[<A]	10[<A]	5[<A]	<5[<A]	59[<A]	<5[<A]	7[<A]
Dissolved Beryllium	ug/L		5.3	2		<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Bismuth	ug/L			2		<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	5000	1200	5		7[<B]	15[<B]	5[<B]	6[<B]	7[<B]	5[<B]	10[<B]
Dissolved Cadmium	ug/L	5	0.01	0.017		0.054[B-A]	0.020[B-A]	0.019[B-A]	0.046[B-A]	0.183[B-A]	<0.017[<A]	<0.017[<A]
Dissolved Chromium	ug/L	50	-	1		2[<A]	1[<A]	1[<A]	2[<A]	5[<A]	1[<A]	2[<A]
Dissolved Cobalt	ug/L		10	1		4[<B]	<1[<B]	<1[<B]	<1[<B]	6[<B]	<1[<B]	1[<B]
Dissolved Copper	ug/L	1000 AO	2	1		2[B]	1[<B]	2[B]	<1[<B]	5[>B]	<1[<B]	5[>B]
Dissolved Iron	ug/L	300 AO	300	50		<50[<B]	<50[<B]	<50[<B]	<50[<B]	<50[<B]	<50[<B]	<50[<B]
Dissolved Lead	ug/L	10	1	0.5		<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]
Dissolved Manganese	ug/L	50 AO	820	2		811[<B]	61[<B]	32[<B]	1230[>B]	14600[>B]	25[<B]	115[<B]
Dissolved Molybdenum	ug/L		73	2		<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Nickel	ug/L		25	2		11[<B]	3[<B]	2[<B]	<2[<B]	7[<B]	<2[<B]	4[<B]
Dissolved Phosphorus	mg/L			0.02		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	50	1.0	1		<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Silver	ug/L		0.1	0.1		0.2[>B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	0.3[>B]
Dissolved Strontium	ug/L		21000	5		38[<B]	93[<B]	14[<B]	48[<B]	75[<B]	25[<B]	13[<B]
Dissolved Thallium	ug/L		0.8	0.1		<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Tin	ug/L		-	2		<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L			2		<2	<2	<2	<2	<2	<2	<2
Dissolved Uranium	ug/L	20	300	0.1		<0.1[<A]	0.5[<A]	<0.1[<A]	0.3[<A]	0.4[<A]	<0.1[<A]	<0.1[<A]
Dissolved Vanadium	ug/L		6	2		<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Zinc	ug/L	5000 AO	30	5		48[>B]	68[>B]	<5[<B]	<5[<B]	14[<B]	<5[<B]	11[<B]

Certified By: Michelle Hildebrand

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Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

SAMPLE DESCRIPTION:					FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15A	FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-09-05	2018-09-05	2018-09-06	2018-09-06	2018-09-06	2018-09-06	2018-09-05
Parameter	Unit	G / S: A	G / S: B	RDL	9528613	9528614	9528615	9528771	9528772	9528773	9528776
pH		7.0-10.5 OG			7.51	7.14	8.07	7.73	7.89	6.70	7.24
Reactive Silica as SiO2	mg/L			0.5	6.7	6.7	9.5	9.1	14.2	6.8	6.6
Chloride	mg/L	250 AO		1	5	7	3	2	3	4	7
Fluoride	mg/L	1.5		0.12	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]
Sulphate	mg/L	500 AO		2	9	7	10	6	8	3	6
Alkalinity	mg/L			5	69	46	79	56	53	7	48
True Color	TCU	15 AO		5	<5	<5	<5	6	5	<5	<5
Turbidity	NTU	0.1-1		0.1	4.0	2.7	1.1	24.9	1.1	12.9	3.8
Electrical Conductivity	umho/cm			1	196	150	201	144	152	55	152
Nitrate + Nitrite as N	mg/L			0.05	0.29	0.06	0.22	0.13	0.51	0.56	0.10
Nitrate as N	mg/L	10		0.05	0.29[<A]	0.06[<A]	0.22[<A]	0.13[<A]	0.51[<A]	0.56[<A]	0.10[<A]
Nitrite as N	mg/L	1.0		0.05	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Ammonia as N	mg/L			0.03	0.05	0.04	0.06	0.06	0.04	0.05	0.04
Total Organic Carbon	mg/L			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.1	<0.5
Ortho-Phosphate as P	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L	200 AO		0.1	9.0	7.8	6.4	5.9	5.3	6.7	7.0
Dissolved Potassium	mg/L			0.1	1.7	2.0	1.0	1.2	1.4	1.0	1.8
Dissolved Calcium	mg/L			0.1	28.6	16.7	31.6	24.8	22.2	2.1	18.4
Dissolved Magnesium	mg/L			0.1	1.4	2.4	1.9	1.3	2.0	0.7	2.3
Bicarb. Alkalinity (as CaCO3)	mg/L			5	69	46	79	56	53	7	48
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L			5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L	500 AO		1	98	71	103	76	76	24	72
Hardness	mg/L				77.2	51.6	86.7	67.3	63.7	8.1	55.4
Langelier Index (@20C)	NA				-0.78	-1.55	-0.12	-0.70	-0.61	-3.66	-1.39
Langelier Index (@ 4C)	NA				-1.10	-1.87	-0.44	-1.02	-0.93	-3.98	-1.71
Saturation pH (@ 20C)	NA				8.29	8.69	8.19	8.43	8.50	10.4	8.63
Saturation pH (@ 4C)	NA				8.61	9.01	8.51	8.75	8.82	10.7	8.95
Anion Sum	me/L				1.73	1.27	1.89	1.31	1.35	0.36	1.29
Cation sum	me/L				1.99	1.44	2.06	1.66	1.55	0.49	1.47

Certified By: Michelle Hildebrand

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AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

SAMPLE DESCRIPTION:					FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15A	FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-09-05	2018-09-05	2018-09-06	2018-09-06	2018-09-06	2018-09-06	2018-09-05
Parameter	Unit	G / S: A	G / S: B	RDL	9528613	9528614	9528615	9528771	9528772	9528773	9528776
% Difference/ Ion Balance (NS)	%				6.9	6.2	4.3	11.9	7.0	15.7	6.7
Dissolved Aluminum	ug/L	100 OG AO	5	5	<5[<B]	<5[<B]	37[>B]	<5[<B]	<5[<B]	10[>B]	<5[<B]
Dissolved Antimony	ug/L	6	20	2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Arsenic	ug/L	10	5.0	2	6[B-A]	<2[<B]	19[>A]	5[B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Barium	ug/L	1000	1000	5	8[<A]	19[<A]	<5[<A]	12[<A]	<5[<A]	<5[<A]	18[<A]
Dissolved Beryllium	ug/L		5.3	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Bismuth	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	5000	1200	5	6[<B]	10[<B]	6[<B]	7[<B]	8[<B]	8[<B]	9[<B]
Dissolved Cadmium	ug/L	5	0.01	0.017	0.032[B-A]	0.107[B-A]	<0.017[<A]	<0.017[<A]	<0.017[<A]	0.023[B-A]	0.096[B-A]
Dissolved Chromium	ug/L	50	-	1	2[<A]	2[<A]	2[<A]	2[<A]	1[<A]	2[<A]	2[<A]
Dissolved Cobalt	ug/L		10	1	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	1[<B]	<1[<B]
Dissolved Copper	ug/L	1000 AO	2	1	<1[<B]	1[<B]	<1[<B]	<1[<B]	<1[<B]	16[>B]	<1[<B]
Dissolved Iron	ug/L	300 AO	300	50	<50[<B]	<50[<B]	155[<B]	83[<B]	<50[<B]	<50[<B]	<50[<B]
Dissolved Lead	ug/L	10	1	0.5	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]
Dissolved Manganese	ug/L	50 AO	820	2	72[<B]	276[<B]	158[<B]	605[<B]	220[<B]	62[<B]	317[<B]
Dissolved Molybdenum	ug/L		73	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Nickel	ug/L		25	2	3[<B]	6[<B]	<2[<B]	3[<B]	<2[<B]	6[<B]	6[<B]
Dissolved Phosphorus	mg/L			0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	50	1.0	1	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Silver	ug/L		0.1	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Strontium	ug/L		21000	5	65[<B]	52[<B]	81[<B]	47[<B]	73[<B]	22[<B]	50[<B]
Dissolved Thallium	ug/L		0.8	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Tin	ug/L		-	2	<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Uranium	ug/L	20	300	0.1	0.7[<A]	<0.1[<A]	1.3[<A]	0.3[<A]	0.2[<A]	0.1[<A]	<0.1[<A]
Dissolved Vanadium	ug/L		6	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Zinc	ug/L	5000 AO	30	5	<5[<B]	<5[<B]	6[<B]	<5[<B]	<5[<B]	22[<B]	<5[<B]

Certified By: Michelle Hildebrand

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

			SAMPLE DESCRIPTION:		DUP-B	DUP-C
			SAMPLE TYPE:		Water	Water
			DATE SAMPLED:		2018-09-05	2018-09-06
Parameter	Unit	G / S: A	G / S: B	RDL	9528777	9528778
pH		7.0-10.5 OG			6.67	7.78
Reactive Silica as SiO2	mg/L			0.5	6.8	12.7
Chloride	mg/L	250 AO		1	4	3
Fluoride	mg/L	1.5		0.12	<0.12[<A]	<0.12[<A]
Sulphate	mg/L	500 AO		2	3	3
Alkalinity	mg/L			5	9	76
True Color	TCU	15 AO		5	12	7
Turbidity	NTU	0.1-1		0.1	3.8	4.5
Electrical Conductivity	umho/cm			1	54	176
Nitrate + Nitrite as N	mg/L			0.05	0.30	0.05
Nitrate as N	mg/L	10		0.05	0.30[<A]	0.05[<A]
Nitrite as N	mg/L	1.0		0.05	<0.05[<A]	<0.05[<A]
Ammonia as N	mg/L			0.03	0.03	0.04
Total Organic Carbon	mg/L			0.5	0.8	<0.5
Ortho-Phosphate as P	mg/L			0.01	<0.01	<0.01
Dissolved Sodium	mg/L	200 AO		0.1	2.8	4.9
Dissolved Potassium	mg/L			0.1	3.0	1.3
Dissolved Calcium	mg/L			0.1	3.9	30.4
Dissolved Magnesium	mg/L			0.1	0.8	1.0
Bicarb. Alkalinity (as CaCO3)	mg/L			5	9	76
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10
Hydroxide	mg/L			5	<5	<5
Calculated TDS	mg/L	500 AO		1	24	90
Hardness	mg/L				13.0	80.0
Langelier Index (@20C)	NA				-3.31	-0.44
Langelier Index (@ 4C)	NA				-3.63	-0.76
Saturation pH (@ 20C)	NA				9.98	8.22
Saturation pH (@ 4C)	NA				10.3	8.54
Anion Sum	me/L				0.38	1.67
Cation sum	me/L				0.46	1.87

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Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

			SAMPLE DESCRIPTION:		DUP-B	DUP-C
			SAMPLE TYPE:		Water	Water
			DATE SAMPLED:		2018-09-05	2018-09-06
Parameter	Unit	G / S: A	G / S: B	RDL	9528777	9528778
% Difference/ Ion Balance (NS)	%				10.3	5.7
Dissolved Aluminum	ug/L	100 OG AO	5	5	9[>B]	<5[<B]
Dissolved Antimony	ug/L	6	20	2	<2[<A]	<2[<A]
Dissolved Arsenic	ug/L	10	5.0	2	14[>A]	<2[<B]
Dissolved Barium	ug/L	1000	1000	5	11[<A]	15[<A]
Dissolved Beryllium	ug/L		5.3	2	<2[<B]	<2[<B]
Dissolved Bismuth	ug/L			2	<2	<2
Dissolved Boron	ug/L	5000	1200	5	6[<B]	8[<B]
Dissolved Cadmium	ug/L	5	0.01	0.017	0.053[B-A]	<0.017[<A]
Dissolved Chromium	ug/L	50	-	1	1[<A]	2[<A]
Dissolved Cobalt	ug/L		10	1	<1[<B]	<1[<B]
Dissolved Copper	ug/L	1000 AO	2	1	1[<B]	<1[<B]
Dissolved Iron	ug/L	300 AO	300	50	<50[<B]	<50[<B]
Dissolved Lead	ug/L	10	1	0.5	<0.5[<B]	<0.5[<B]
Dissolved Manganese	ug/L	50 AO	820	2	10[<B]	585[<B]
Dissolved Molybdenum	ug/L		73	2	<2[<B]	<2[<B]
Dissolved Nickel	ug/L		25	2	3[<B]	3[<B]
Dissolved Phosphorus	mg/L			0.02	<0.02	<0.02
Dissolved Selenium	ug/L	50	1.0	1	<1[<B]	<1[<B]
Dissolved Silver	ug/L		0.1	0.1	<0.1[<B]	<0.1[<B]
Dissolved Strontium	ug/L		21000	5	23[<B]	92[<B]
Dissolved Thallium	ug/L		0.8	0.1	<0.1[<B]	<0.1[<B]
Dissolved Tin	ug/L		-	2	<2	<2
Dissolved Titanium	ug/L			2	<2	<2
Dissolved Uranium	ug/L	20	300	0.1	<0.1[<A]	1.3[<A]
Dissolved Vanadium	ug/L		6	2	<2[<B]	<2[<B]
Dissolved Zinc	ug/L	5000 AO	30	5	5[<B]	7[<B]

Certified By: Michelle Hildebrand

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Canadian Drinking Water Quality - updated 2017-05, B Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9528572-9528580	Metals analysis completed on a filtered sample.
9528581	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
9528582-9528585	Metals analysis completed on a filtered sample.
9528586	Metals analysis completed on a filtered sample. Ion Balance is biased high, contributing parameters have been confirmed.
9528587-9528605	Metals analysis completed on a filtered sample.
9528606-9528607	Metals analysis completed on a filtered sample. Ion Balance is biased high, contributing parameters have been confirmed.
9528608-9528609	Metals analysis completed on a filtered sample.
9528610	Metals analysis completed on a filtered sample. Ion Balance is biased high, contributing parameters have been confirmed.
9528611	Metals analysis completed on a filtered sample.
9528612	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
9528613-9528615	Metals analysis completed on a filtered sample.
9528771	Metals analysis completed on a filtered sample. Ion Balance is biased high, contributing parameters have been confirmed.
9528772	Metals analysis completed on a filtered sample.
9528773	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
9528776-9528778	Metals analysis completed on a filtered sample.

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: Michelle Hildebrand

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Total + Dissolved Phosphorus (Water)

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

SAMPLE DESCRIPTION:				FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A	FMS-HG18-05B
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-09-05	2018-09-05	2018-09-05	2018-09-05	2018-09-06	2018-09-06	2018-09-05	2018-09-06
Parameter	Unit	G / S	RDL	9528572	9528577	9528578	9528579	9528580	9528581	9528582	9528583
Total Phosphorus	mg/L		0.005	0.010	0.047	0.017	0.036	0.018	0.018	0.022	0.102
Total Phosphorus, Dissolved	mg/L		0.005	<0.005	0.006	<0.005	0.005	<0.005	0.017	0.009	0.008

SAMPLE DESCRIPTION:				FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-10A
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-09-05	2018-09-06	2018-09-06	2018-09-05	2018-09-05	2018-09-08	2018-09-06	2018-09-05
Parameter	Unit	G / S	RDL	9528584	9528585	9528586	9528587	9528604	9528605	9528606	9528607
Total Phosphorus	mg/L		0.005	0.093	0.016	0.057	0.015	0.027	0.011	0.016	0.012
Total Phosphorus, Dissolved	mg/L		0.005	0.009	<0.005	0.019	0.005	<0.005	0.005	<0.005	<0.005

SAMPLE DESCRIPTION:				FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15A
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-09-05	2018-09-04	2018-09-04	2018-09-05	2018-09-05	2018-09-05	2018-09-05	2018-09-06
Parameter	Unit	G / S	RDL	9528608	9528609	9528610	9528611	9528612	9528613	9528614	9528615
Total Phosphorus	mg/L		0.005	0.063	0.010	0.016	0.009	0.029	0.015	0.014	0.008
Total Phosphorus, Dissolved	mg/L		0.005	<0.005	0.009	0.007	0.005	0.006	0.006	<0.005	0.006

SAMPLE DESCRIPTION:				FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A	DUP-B	DUP-C
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-09-06	2018-09-06	2018-09-06	2018-09-05	2018-09-05	2018-09-06
Parameter	Unit	G / S	RDL	9528771	9528772	9528773	9528776	9528777	9528778
Total Phosphorus	mg/L		0.005	0.053	0.006	0.037	0.017	0.016	<0.005
Total Phosphorus, Dissolved	mg/L		0.005	<0.005	<0.005	0.005	<0.005	0.012	<0.005

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Toronto (unless marked by *)

Certified By: Michelle Hildebrand

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Various Inorganics

DATE RECEIVED: 2018-09-07

DATE REPORTED: 2018-10-04

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: FMS-HG18-02A SAMPLE TYPE: Water DATE SAMPLED: 2018-09-05 9528572	FMS-HG18-02B Water 2018-09-05 9528577	FMS-HG18-03A Water 2018-09-05 9528578	FMS-HG18-03B Water 2018-09-05 9528579	FMS-HG18-04A Water 2018-09-06 9528580	FMS-HG18-04B Water 2018-09-06 9528581	FMS-HG18-05A Water 2018-09-05 9528582	FMS-HG18-05B Water 2018-09-06 9528583
Chemical Oxygen Demand	mg/L		3	<3	7	<3	<3	<3	<3	<3	<3
Dissolved Organic Carbon	mg/L		0.5	<0.5	<0.5	0.9	<0.5	<0.5	<0.5	0.6	1.8
Total Suspended Solids	mg/L		5	9	6	16	<5	5	17	5	225

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: FMS-HG18-06A SAMPLE TYPE: Water DATE SAMPLED: 2018-09-05 9528584	FMS-HG18-07A Water 2018-09-06 9528585	FMS-HG18-07B Water 2018-09-06 9528586	FMS-HG18-08A Water 2018-09-05 9528587	FMS-HG18-08B Water 2018-09-05 9528604	FMS-HG18-09A Water 2018-09-08 9528605	FMS-HG18-09B Water 2018-09-06 9528606	FMS-HG18-10A Water 2018-09-05 9528607
Chemical Oxygen Demand	mg/L		3	9	20	63	<3	<3	<3	<3	<3
Dissolved Organic Carbon	mg/L		0.5	<0.5	<0.5	17.8	<0.5	<0.5	<0.5	<0.5	<0.5
Total Suspended Solids	mg/L		5	5	5	8	23	22	5	28	50

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: FMS-HG18-10B SAMPLE TYPE: Water DATE SAMPLED: 2018-09-05 9528608	FMS-HG18-11A Water 2018-09-04 9528609	FMS-HG18-11B Water 2018-09-04 9528610	FMS-HG18-13A Water 2018-09-05 9528611	FMS-HG18-13B Water 2018-09-05 9528612	FMS-HG18-14A Water 2018-09-05 9528613	FMS-HG18-14B Water 2018-09-05 9528614	FMS-HG18-15A Water 2018-09-06 9528615
Chemical Oxygen Demand	mg/L		3	<3	5	8	7	4	5	<3	3
Dissolved Organic Carbon	mg/L		0.5	0.8	<0.5	<0.5	<0.5	0.9	<0.5	<0.5	<0.5
Total Suspended Solids	mg/L		5	118	7	<5	<5	32	17	5	<5

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: FMS-HG18-15B SAMPLE TYPE: Water DATE SAMPLED: 2018-09-06 9528771	FMS-HG18-16A Water 2018-09-06 9528772	FMS-HG18-16B Water 2018-09-06 9528773	DUP-A Water 2018-09-05 9528776	DUP-B Water 2018-09-05 9528777	DUP-C Water 2018-09-06 9528778
Chemical Oxygen Demand	mg/L		3	4	<3	<3	3	6	3
Dissolved Organic Carbon	mg/L		0.5	<0.5	<0.5	0.9	<0.5	0.8	<0.5
Total Suspended Solids	mg/L		5	44	<5	40	<5	15	10

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: Michelle Hildebrand

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AGAT Laboratories

Guideline Violation

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
9528572	FMS-HG18-02A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	112
9528572	FMS-HG18-02A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	9.4
9528572	FMS-HG18-02A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	11
9528572	FMS-HG18-02A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	9
9528577	FMS-HG18-02B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300 AO	3440
9528577	FMS-HG18-02B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	3080
9528577	FMS-HG18-02B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	16.1
9528577	FMS-HG18-02B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	15
9528577	FMS-HG18-02B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300	3440
9528577	FMS-HG18-02B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	820	3080
9528578	FMS-HG18-03A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	17
9528578	FMS-HG18-03A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	7.4
9528578	FMS-HG18-03A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	17
9528579	FMS-HG18-03B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	136
9528579	FMS-HG18-03B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	1.5
9528579	FMS-HG18-03B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.74
9528579	FMS-HG18-03B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.020
9528579	FMS-HG18-03B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	3
9528579	FMS-HG18-03B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Zinc	ug/L	30	31
9528580	FMS-HG18-04A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	47
9528580	FMS-HG18-04A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	306
9528580	FMS-HG18-04A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	1.6
9528580	FMS-HG18-04A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	7
9528580	FMS-HG18-04A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	47
9528580	FMS-HG18-04A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.020
9528581	FMS-HG18-04B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	1010
9528581	FMS-HG18-04B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	31.1
9528581	FMS-HG18-04B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.086
9528581	FMS-HG18-04B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	820	1010
9528581	FMS-HG18-04B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Zinc	ug/L	30	33
9528582	FMS-HG18-05A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	13

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CANADA B3B 1M2
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Guideline Violation

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
9528582	FMS-HG18-05A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	3.0
9528582	FMS-HG18-05A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.53
9528582	FMS-HG18-05A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	7
9528582	FMS-HG18-05A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	13
9528582	FMS-HG18-05A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.018
9528583	FMS-HG18-05B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	157
9528583	FMS-HG18-05B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	94.6
9528583	FMS-HG18-05B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.87
9528583	FMS-HG18-05B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	24
9528583	FMS-HG18-05B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	6
9528583	FMS-HG18-05B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.034
9528584	FMS-HG18-06A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	169
9528584	FMS-HG18-06A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300 AO	8200
9528584	FMS-HG18-06A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	835
9528584	FMS-HG18-06A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	True Color	TCU	15 AO	28
9528584	FMS-HG18-06A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	6.5
9528584	FMS-HG18-06A	NS-ContSiteSW_FW_FL	Mercury Analysis in Water (Total)	Total Mercury	ug/L	0.026	0.028
9528584	FMS-HG18-06A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	26
9528584	FMS-HG18-06A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	169
9528584	FMS-HG18-06A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300	8200
9528584	FMS-HG18-06A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	820	835
9528585	FMS-HG18-07A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	35
9528585	FMS-HG18-07A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	646
9528585	FMS-HG18-07A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	1.4
9528585	FMS-HG18-07A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	35
9528586	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	100 OG AO	1060
9528586	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	24
9528586	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300 AO	7830
9528586	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	321
9528586	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	True Color	TCU	15 AO	438
9528586	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	14.6
9528586	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.54
9528586	FMS-HG18-07B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	1060

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Guideline Violation

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
9528586	FMS-HG18-07B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	24
9528586	FMS-HG18-07B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300	7830
9528587	FMS-HG18-08A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	11.5
9528604	FMS-HG18-08B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	296
9528604	FMS-HG18-08B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	9.2
9528604	FMS-HG18-08B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	3
9528605	FMS-HG18-09A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	597
9528605	FMS-HG18-09A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	4.0
9528606	FMS-HG18-09B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	811
9528606	FMS-HG18-09B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	9.1
9528606	FMS-HG18-09B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.78
9528606	FMS-HG18-09B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.054
9528606	FMS-HG18-09B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Silver	ug/L	0.1	0.2
9528606	FMS-HG18-09B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Zinc	ug/L	30	48
9528607	FMS-HG18-10A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	61
9528607	FMS-HG18-10A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	25.6
9528607	FMS-HG18-10A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.020
9528607	FMS-HG18-10A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Zinc	ug/L	30	68
9528608	FMS-HG18-10B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	17.2
9528608	FMS-HG18-10B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.63
9528608	FMS-HG18-10B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	36
9528608	FMS-HG18-10B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.019
9528609	FMS-HG18-11A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	1230
9528609	FMS-HG18-11A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	2.6
9528609	FMS-HG18-11A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.91
9528609	FMS-HG18-11A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.046
9528609	FMS-HG18-11A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	820	1230
9528610	FMS-HG18-11B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	14600
9528610	FMS-HG18-11B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	3.0
9528610	FMS-HG18-11B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.89
9528610	FMS-HG18-11B	NS-ContSiteSW_FW_FL	Mercury Analysis in Water (Total)	Total Mercury	ug/L	0.026	0.028
9528610	FMS-HG18-11B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	6

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Guideline Violation

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
9528610	FMS-HG18-11B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.183
9528610	FMS-HG18-11B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	5
9528610	FMS-HG18-11B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	820	14600
9528611	FMS-HG18-13A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.99
9528612	FMS-HG18-13B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	115
9528612	FMS-HG18-13B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	12.7
9528612	FMS-HG18-13B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.47
9528612	FMS-HG18-13B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	15
9528612	FMS-HG18-13B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	5
9528612	FMS-HG18-13B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Silver	ug/L	0.1	0.3
9528613	FMS-HG18-14A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	72
9528613	FMS-HG18-14A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	4.0
9528613	FMS-HG18-14A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	6
9528613	FMS-HG18-14A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.032
9528614	FMS-HG18-14B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	276
9528614	FMS-HG18-14B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	2.7
9528614	FMS-HG18-14B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.107
9528615	FMS-HG18-15A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	19
9528615	FMS-HG18-15A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	158
9528615	FMS-HG18-15A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	1.1
9528615	FMS-HG18-15A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	37
9528615	FMS-HG18-15A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	19
9528771	FMS-HG18-15B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	605
9528771	FMS-HG18-15B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	24.9
9528772	FMS-HG18-16A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	220
9528772	FMS-HG18-16A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	1.1
9528773	FMS-HG18-16B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	62
9528773	FMS-HG18-16B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	12.9
9528773	FMS-HG18-16B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.70
9528773	FMS-HG18-16B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	10
9528773	FMS-HG18-16B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.023
9528773	FMS-HG18-16B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	16

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Guideline Violation

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
9528776	DUP-A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	317
9528776	DUP-A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	3.8
9528776	DUP-A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.096
9528777	DUP-B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	14
9528777	DUP-B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	3.8
9528777	DUP-B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.67
9528777	DUP-B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	9
9528777	DUP-B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	14
9528777	DUP-B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.053
9528778	DUP-C	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	585
9528778	DUP-C	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	4.5

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date: Oct 04, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
Benzene	1	9528572	< 0.001	< 0.001	NA	< 0.001	116%	70%	130%	125%	70%	130%			
Toluene	1	9528572	< 0.001	< 0.001	NA	< 0.001	94%	70%	130%	111%	70%	130%			
Ethylbenzene	1	9528572	< 0.001	< 0.001	NA	< 0.001	90%	70%	130%	104%	70%	130%			
Xylene (Total)	1	9528572	< 0.002	< 0.002	NA	< 0.002	106%	70%	130%	101%	70%	130%			
C6-C10 (less BTEX)	1	9528572	< 0.01	< 0.01	NA	< 0.01	86%	70%	130%	112%	70%	130%	NA	70%	130%
>C10-C16 Hydrocarbons	1	9524872	< 0.05	< 0.05	NA	< 0.05	105%	70%	130%	102%	70%	130%	NA	70%	130%
>C16-C21 Hydrocarbons	1	9524872	< 0.10	< 0.10	NA	< 0.10	96%	70%	130%	102%	70%	130%	NA	70%	130%
>C21-C32 Hydrocarbons	1	9524872	< 0.1	< 0.1	NA	< 0.1	75%	70%	130%	102%	70%	130%	NA	70%	130%
Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
>C10-C16 Hydrocarbons	1	9528614	< 0.05	< 0.05	NA	< 0.05	115%	70%	130%	101%	70%	130%	NA	70%	130%
>C16-C21 Hydrocarbons	1	9528614	< 0.10	< 0.10	NA	< 0.10	106%	70%	130%	101%	70%	130%	NA	70%	130%
>C21-C32 Hydrocarbons	1	9528614	< 0.1	< 0.1	NA	< 0.1	88%	70%	130%	101%	70%	130%	NA	70%	130%
Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
Benzene	1	9518606	< 0.001	< 0.001	NA	< 0.001	96%	70%	130%	106%	70%	130%			
Toluene	1	9518606	< 0.001	< 0.001	NA	< 0.001	95%	70%	130%	105%	70%	130%			
Ethylbenzene	1	9518606	< 0.001	< 0.001	NA	< 0.001	96%	70%	130%	105%	70%	130%			
Xylene (Total)	1	9518606	< 0.002	< 0.002	NA	< 0.002	98%	70%	130%	111%	70%	130%			
C6-C10 (less BTEX)	1	9518606	< 0.01	< 0.01	NA	< 0.01	103%	70%	130%	122%	70%	130%	NA	70%	130%
Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
>C10-C16 Hydrocarbons	1	9528130	< 0.05	< 0.05	NA	< 0.05	94%	70%	130%	130%	70%	130%	106%	70%	130%
>C16-C21 Hydrocarbons	1	9528130	< 0.10	< 0.10	NA	< 0.10	97%	70%	130%	130%	70%	130%	106%	70%	130%
>C21-C32 Hydrocarbons	1	9528130	< 0.1	< 0.1	NA	< 0.1	82%	70%	130%	130%	70%	130%	106%	70%	130%
Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
Benzene	1	9528778	< 0.001	< 0.001	NA	< 0.001	83%	70%	130%	106%	70%	130%			
Toluene	1	9528778	< 0.001	< 0.001	NA	< 0.001	83%	70%	130%	105%	70%	130%			
Ethylbenzene	1	9528778	< 0.001	< 0.001	NA	< 0.001	82%	70%	130%	105%	70%	130%			
Xylene (Total)	1	9528778	< 0.002	< 0.002	NA	< 0.002	89%	70%	130%	111%	70%	130%			
C6-C10 (less BTEX)	1	9528778	< 0.01	< 0.01	NA	< 0.01	86%	70%	130%	109%	70%	130%	NA	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Oct 04, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Certified By:

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Water Analysis

RPT Date: Oct 04, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Standard Water Analysis + Dissolved Metals															
pH	9525103		6.49	6.47	0.3%	<	102%	80%	120%	NA	80%	120%	NA	80%	120%
Reactive Silica as SiO2	1	9525103	1.2	1.3	NA	< 0.5	90%	80%	120%		80%	120%	80%	80%	120%
Chloride	9525919		6	5	5.2%	< 1	91%	80%	120%	NA	80%	120%	91%	80%	120%
Fluoride	9525919		<0.12	<0.12	NA	< 0.12	116%	80%	120%	NA	80%	120%	104%	80%	120%
Sulphate	9525919		14	14	1.3%	< 2	108%	80%	120%	NA	80%	120%	NA	80%	120%
Alkalinity	9525103		<5	<5	NA	< 5	94%	80%	120%	NA	80%	120%	NA	80%	120%
True Color	9525359		<5	<5	NA	< 5	80%	80%	120%	NA			NA		
Turbidity	9528605	9528605	4.0	4.6	15.2%	< 0.1	95%	80%	120%	NA			NA		
Electrical Conductivity	9525103		38	38	0.0%	< 1	101%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrate as N	9525919		0.10	0.07	NA	< 0.05	92%	80%	120%	NA	80%	120%	86%	80%	120%
Nitrite as N	9525919		<0.05	<0.05	NA	< 0.05	96%	80%	120%	NA	80%	120%	101%	80%	120%
Ammonia as N	1	9497554	0.07	0.07	NA	< 0.03	102%	80%	120%		80%	120%	92%	80%	120%
Total Organic Carbon	9528572	9528572	<0.5	<0.5	NA	< 0.5	91%	80%	120%	NA	80%	120%	91%	80%	120%
Ortho-Phosphate as P	1	9549755	<0.01	<0.01	NA	< 0.01	88%	80%	120%		80%	120%	96%	80%	120%
Dissolved Sodium	9528605	9528605	4.7	5.1	8.0%	< 0.1	105%	80%	120%	104%	80%	120%	NA	70%	130%
Dissolved Potassium	9528605	9528605	1.2	1.3	9.5%	< 0.1	105%	80%	120%	103%	80%	120%	NA	70%	130%
Dissolved Calcium	9528605	9528605	28.2	28.6	1.8%	< 0.1	102%	80%	120%	103%	80%	120%	NA	70%	130%
Dissolved Magnesium	9528605	9528605	1.0	1.0	5.5%	< 0.1	106%	80%	120%	105%	80%	120%	86%	70%	130%
Bicarb. Alkalinity (as CaCO3)	9525103		<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	9525103		<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	9525103		<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Dissolved Aluminum	9528605	9528605	<5	<5	NA	< 5	106%	80%	120%	104%	80%	120%	89%	70%	130%
Dissolved Antimony	9528605	9528605	<2	<2	NA	< 2	84%	80%	120%	105%	80%	120%	114%	70%	130%
Dissolved Arsenic	9528605	9528605	<2	<2	NA	< 2	98%	80%	120%	99%	80%	120%	112%	70%	130%
Dissolved Barium	9528605	9528605	14	15	NA	< 5	99%	80%	120%	99%	80%	120%	106%	70%	130%
Dissolved Beryllium	9528605	9528605	<2	<2	NA	< 2	113%	80%	120%	115%	80%	120%	114%	70%	130%
Dissolved Bismuth	9528605	9528605	<2	<2	NA	< 2	104%	80%	120%	109%	80%	120%	71%	70%	130%
Dissolved Boron	9528605	9528605	7	8	NA	< 5	113%	80%	120%	114%	80%	120%	115%	70%	130%
Dissolved Cadmium	9528605	9528605	<0.017	<0.017	NA	< 0.09	92%	80%	120%	94%	80%	120%	104%	70%	130%
Dissolved Chromium	9528605	9528605	1	2	NA	< 1	111%	80%	120%	100%	80%	120%	113%	70%	130%
Dissolved Cobalt	9528605	9528605	<1	<1	NA	< 1	100%	80%	120%	100%	80%	120%	107%	70%	130%
Dissolved Copper	9528605	9528605	<1	<1	NA	< 2	102%	80%	120%	102%	80%	120%	109%	70%	130%
Dissolved Iron	9528605	9528605	<50	<50	NA	< 50	112%	80%	120%	108%	80%	120%	110%	70%	130%
Dissolved Lead	9528605	9528605	<0.5	<0.5	NA	< 0.5	106%	80%	120%	107%	80%	120%	109%	70%	130%
Dissolved Manganese	9528605	9528605	597	620	3.8%	< 2	107%	80%	120%	105%	80%	120%	NA	70%	130%
Dissolved Molybdenum	9528605	9528605	<2	<2	NA	< 2	95%	80%	120%	97%	80%	120%	78%	70%	130%
Dissolved Nickel	9528605	9528605	3	3	NA	< 2	101%	80%	120%	99%	80%	120%	108%	70%	130%
Dissolved Phosphorus	9528605	9528605	<0.02	<0.02	NA	< 0.02	NA	80%	120%	120%	80%	120%	NA	70%	130%
Dissolved Selenium	9528605	9528605	<1	<1	NA	< 1	105%	80%	120%	100%	80%	120%	115%	70%	130%

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CANADA B3B 1M2
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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Oct 04, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Dissolved Silver	9528605	9528605	<0.1	<0.1	NA	< 0.1	99%	80%	120%	104%	80%	120%	92%	70%	130%
Dissolved Strontium	9528605	9528605	91	98	6.7%	< 5	100%	80%	120%	100%	80%	120%	NA	70%	130%
Dissolved Thallium	9528605	9528605	<0.1	<0.1	NA	< 0.1	105%	80%	120%	106%	80%	120%	109%	70%	130%
Dissolved Tin	9528605	9528605	<2	<2	NA	< 2	93%	80%	120%	97%	80%	120%	86%	70%	130%
Dissolved Titanium	9528605	9528605	<2	<2	NA	< 2	102%	80%	120%	101%	80%	120%	120%	70%	130%
Dissolved Uranium	9528605	9528605	1.2	1.3	5.8%	< 0.1	102%	80%	120%	102%	80%	120%	107%	70%	130%
Dissolved Vanadium	9528605	9528605	<2	<2	NA	< 2	95%	80%	120%	95%	80%	120%	103%	70%	130%
Dissolved Zinc	9528605	9528605	7	8	NA	< 5	106%	80%	120%	106%	80%	120%	119%	70%	130%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Mercury Analysis in Water (Dissolved)															
Dissolved Mercury	1	9528611	<0.016	<0.016	NA	< 0.026	99%	80%	120%		80%	120%	94%	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Mercury Analysis in Water (Total)															
Total Mercury	1	9528585	<0.016	<0.016	NA	< 0.026	95%	80%	120%		80%	120%	111%	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Various Inorganics															
Chemical Oxygen Demand	9528572	9528572	<3	<3	NA	< 3	97%	80%	120%	NA			96%	80%	120%
Dissolved Organic Carbon	1		NA	NA	NA	< 0.5	91%	80%	120%	NA	80%	120%	NA	80%	120%
Total Suspended Solids	9529303		6	5	NA	< 5	101%	80%	120%	NA			87%	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Standard Water Analysis + Dissolved Metals															
pH	9528582	9528582	6.53	6.51	0.3%	<	102%	80%	120%	NA	80%	120%	NA	80%	120%
Chloride	9528605	9528605	3	4	NA	< 1	92%	80%	120%	NA	80%	120%	100%	80%	120%
Fluoride	9528605	9528605	<0.12	<0.12	NA	< 0.12	116%	80%	120%	NA	80%	120%	111%	80%	120%
Sulphate	9528605	9528605	4	4	NA	< 2	107%	80%	120%	NA	80%	120%	100%	80%	120%
Alkalinity	9528582	9528582	10	9	NA	< 5	94%	80%	120%	NA	80%	120%	NA	80%	120%
Electrical Conductivity	9528582	9528582	54	53	2.1%	< 1	101%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrate as N	9528605	9528605	<0.05	<0.05	NA	< 0.05	95%	80%	120%	NA	80%	120%	91%	80%	120%
Nitrite as N	9528605	9528605	<0.05	<0.05	NA	< 0.05	97%	80%	120%	NA	80%	120%	102%	80%	120%
Total Organic Carbon	9528586	9528586	21.8	21.7	0.3%	< 0.5	97%	80%	120%	NA	80%	120%	118%	80%	120%
Bicarb. Alkalinity (as CaCO3)	9528582	9528582	10	9	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	9528582	9528582	<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	9528582	9528582	<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Standard Water Analysis + Dissolved Metals															

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AGAT WORK ORDER: 18X382529

PROJECT: 1895674

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Oct 04, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
pH	9528773	9528773	6.70	6.55	2.3%	<	102%	80%	120%	NA	80%	120%	NA	80%	120%
Alkalinity	9528773	9528773	7	6	NA	< 5	94%	80%	120%	NA	80%	120%	NA	80%	120%
Electrical Conductivity	9528773	9528773	55	53	2.7%	< 1	103%	80%	120%	NA	80%	120%	NA	80%	120%
Total Organic Carbon	9528612	9528612	0.9	1.1	NA	< 0.5	85%	80%	120%	NA	80%	120%	103%	80%	120%
Bicarb. Alkalinity (as CaCO3)	9528773	9528773	7	6	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	9528773	9528773	<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	9528773	9528773	<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Standard Water Analysis + Dissolved Metals															
Dissolved Sodium	9528778	9528778	4.9	4.6	5.4%	< 0.1	100%	80%	120%	93%	80%	120%	NA	70%	130%
Dissolved Potassium	9528778	9528778	1.3	1.2	6.6%	< 0.1	104%	80%	120%	94%	80%	120%	NA	70%	130%
Dissolved Calcium	9528778	9528778	30.4	30.1	1.1%	< 0.1	100%	80%	120%	96%	80%	120%	NA	70%	130%
Dissolved Magnesium	9528778	9528778	1.0	1.0	0.8%	< 0.1	100%	80%	120%	95%	80%	120%	84%	70%	130%
Dissolved Aluminum	9528778	9528778	<5	<5	NA	< 5	101%	80%	120%	94%	80%	120%	88%	70%	130%
Dissolved Antimony	9528778	9528778	<2	<2	NA	< 2	96%	80%	120%	100%	80%	120%	115%	70%	130%
Dissolved Arsenic	9528778	9528778	<2	<2	NA	< 2	100%	80%	120%	89%	80%	120%	106%	70%	130%
Dissolved Barium	9528778	9528778	15	14	NA	< 5	103%	80%	120%	91%	80%	120%	103%	70%	130%
Dissolved Beryllium	9528778	9528778	<2	<2	NA	< 2	105%	80%	120%	93%	80%	120%	124%	70%	130%
Dissolved Bismuth	9528778	9528778	<2	<2	NA	< 2	110%	80%	120%	100%	80%	120%	70%	70%	130%
Dissolved Boron	9528778	9528778	8	7	NA	< 5	101%	80%	120%	92%	80%	120%	121%	70%	130%
Dissolved Cadmium	9528778	9528778	<0.017	<0.017	NA	< 0.09	97%	80%	120%	84%	80%	120%	105%	70%	130%
Dissolved Chromium	9528778	9528778	2	2	NA	< 1	98%	80%	120%	83%	80%	120%	108%	70%	130%
Dissolved Cobalt	9528778	9528778	<1	<1	NA	< 1	107%	80%	120%	95%	80%	120%	110%	70%	130%
Dissolved Copper	9528778	9528778	<1	<1	NA	< 2	103%	80%	120%	101%	80%	120%	105%	70%	130%
Dissolved Iron	9528778	9528778	<50	<50	NA	< 50	104%	80%	120%	89%	80%	120%	98%	70%	130%
Dissolved Lead	9528778	9528778	<0.5	<0.5	NA	< 0.5	111%	80%	120%	96%	80%	120%	109%	70%	130%
Dissolved Manganese	9528778	9528778	585	590	1.0%	< 2	105%	80%	120%	94%	80%	120%	NA	70%	130%
Dissolved Molybdenum	9528778	9528778	<2	<2	NA	< 2	95%	80%	120%	84%	80%	120%	104%	70%	130%
Dissolved Nickel	9528778	9528778	3	3	NA	< 2	98%	80%	120%	87%	80%	120%	104%	70%	130%
Dissolved Phosphorus	9528778	9528778	<0.02	<0.02	NA	< 0.02	99%	80%	120%	91%	80%	120%	NA	70%	130%
Dissolved Selenium	9528778	9528778	<1	<1	NA	< 1	101%	80%	120%	86%	80%	120%	111%	70%	130%
Dissolved Silver	9528778	9528778	<0.1	<0.1	NA	< 0.1	104%	80%	120%	91%	80%	120%	99%	70%	130%
Dissolved Strontium	9528778	9528778	92	84	8.2%	< 5	99%	80%	120%	89%	80%	120%	NA	70%	130%
Dissolved Thallium	9528778	9528778	<0.1	<0.1	NA	< 0.1	109%	80%	120%	97%	80%	120%	107%	70%	130%
Dissolved Tin	9528778	9528778	<2	<2	NA	< 2	94%	80%	120%	86%	80%	120%	108%	70%	130%
Dissolved Titanium	9528778	9528778	<2	<2	NA	< 2	100%	80%	120%	93%	80%	120%	98%	70%	130%
Dissolved Uranium	9528778	9528778	1.3	1.3	4.8%	< 0.1	105%	80%	120%	92%	80%	120%	107%	70%	130%
Dissolved Vanadium	9528778	9528778	<2	<2	NA	< 2	95%	80%	120%	83%	80%	120%	99%	70%	130%
Dissolved Zinc	9528778	9528778	7	7	NA	< 5	113%	80%	120%	98%	80%	120%	128%	70%	130%

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.

Results relate only to the items tested. Results apply to samples as received.

AGAT Laboratories
11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Oct 04, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Various Inorganics															
Dissolved Organic Carbon	2		NA	NA	NA	< 0.5	97%	80%	120%	NA	80%	120%	NA	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Various Inorganics															
Dissolved Organic Carbon	3		NA	NA	NA	< 0.5	85%	80%	120%	NA	80%	120%	NA	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Analyses Inorganiques															
Cyanures totaux	9528476		<0.005	<0.005	NA	< 0.005	91%	80%	120%	108%	80%	120%	104%	80%	120%
Comments: NA : Non applicable															
NA dans l'écart du duplicata indique que l'écart n'a pu être calculé car l'un ou les deux résultats sont < 5x LDR.															
NA dans le pourcentage de récupération de l'échantillon fortifié indique que le résultat n'est pas fourni en raison de l'hétérogénéité de l'échantillon ou de la concentration trop élevée par rapport à l'ajout.															
NA dans le blanc fortifié ou le MRC indique qu'il n'est pas requis par la procédure.															
Le pourcentage de récupération du MRC peut être en dehors du critère d'acceptabilité de 80-120%, s'il est conforme à l'écart du certificat du matériau de référence.															
Total + Dissolved Phosphorus (Water)															
Total Phosphorus	9528572	9528572	0.01	0.01	NA	< 0.005	101%	90%	110%	102%	90%	110%	100%	70%	130%
Total Phosphorus, Dissolved	9528572	9528572	<0.005	<0.005	NA	< 0.005	93%	90%	110%	95%	90%	110%	101%	80%	120%
Total + Dissolved Phosphorus (Water)															
Total Phosphorus	9528612	9528612	0.029	0.032	9.8%	< 0.005	106%	90%	110%	102%	90%	110%	104%	70%	130%
Total Phosphorus, Dissolved	9528612	9528612	0.006	0.007	NA	< 0.005	102%	90%	110%	95%	90%	110%	93%	80%	120%
Free Cyanide (Water)															
Cyanide, Free	9533410		<0.002	<0.002	NA	< 0.002	99%	90%	110%	108%	90%	110%	100%	70%	130%

Certified By: Michelle Hildebrand

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CANADA B3B 1M2
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Method Summary

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Miscellaneous Analysis			
Subcontracted Data			
Trace Organics Analysis			
Benzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Toluene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Ethylbenzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Xylene (Total)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
C6-C10 (less BTEX)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
>C10-C16 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C16-C21 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C21-C32 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Modified TPH (Tier 1)	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	CALCULATION
Resemblance Comment	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
Return to Baseline at C32	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - VPH	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
n-Dotriacontane - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Cyanures totaux	INOR-101-6061F	MA. 300 - CN 1.2	COLORIMÉTRIE
Cyanide, Free	INOR-93-6052	MOE CN-3015 & SM 4500 CN- I	TECHNICON AUTO ANALYZER
Dissolved Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
Total Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
pH	INOR-121-6001	SM 4500 H+B	PC TITRATE
Reactive Silica as SiO2	INOR-121-6027	SM 4110 B	COLORIMETER
Chloride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Fluoride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Alkalinity	INOR-121-6001	SM 2320 B	
True Color	INOR-121-6014	SM 2120 C	NEPHELOMETER
Turbidity	INOR-121-6022	SM 2130 B	NEPHELOMETER
Electrical Conductivity	INOR-121-6001	SM 2510 B	PC TITRATE
Nitrate + Nitrite as N	INORG-121-6005	SM 4110 B	CALCULATION
Nitrate as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-121-6047	SM 4500-NH3 G	COLORIMETER
Total Organic Carbon	INORG-121-6026	SM 5310 B	TOC ANALYZER
Ortho-Phosphate as P	INOR-121-6012	SM 4110 B	COLORIMETER
Dissolved Sodium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Potassium	MET121-6104 & MET-121-6105	SM 3125	ICP-MS
Dissolved Calcium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Magnesium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Bicarb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Carb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Hydroxide	INORG-121-6001	SM 2320 B	PC-TITRATE
Calculated TDS	CALCULATION	SM 1030E	CALCULATION
Hardness	CALCULATION	SM 2340B	CALCULATION
Langelier Index (@20C)	CALCULATION	CALCULATION	CALCULATION
Langelier Index (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 20C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Anion Sum	CALCULATION	SM 1030E	CALCULATION
Cation sum	CALCULATION	SM 1030E	CALCULATION
% Difference/ Ion Balance (NS)	CALCULATION	SM 1030E	CALCULATION
Dissolved Aluminum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Antimony	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Arsenic	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Barium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Beryllium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS

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CANADA B3B 1M2
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FAX (902)468-8924
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Method Summary

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 18X382529

PROJECT: 1895674

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Dissolved Bismuth	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Boron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cadmium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Chromium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cobalt	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Lead	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Molybdenum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Nickel	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Phosphorus	MET-121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Selenium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Silver	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Strontium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Thallium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Tin	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Titanium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Uranium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Vanadium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Phosphorus	INOR-93-6022	SM 4500-P B&E	SPECTROPHOTOMETER
Total Phosphorus, Dissolved	INOR-93-6022	SM 4500-P B&E	SPECTROPHOTOMETER
Chemical Oxygen Demand	INORG-121-6013	SM 5220 B	SPECTROPHOTOMETER
Dissolved Organic Carbon	INORG-121-6026	SM 5310 B	TOC ANALYZER
Total Suspended Solids	INOR-121-6024, 6025	SM 2540C, D	GRAVIMETRIC

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Unit 122 • 11 Morris Drive
Dartmouth, NS
B3B 1M2
webearth.agatlabs.com • www.agatlabs.com
P: 902.468.8718 • F: 902.468.8924

Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: 3.7 — 6.2.
Hold Time:
AGAT Job Number: A382529
Notes:

Report Information
Company: Golder Associates
Contact: Glen Merkley
Address: 201 Brownlow Avenue, Suite 26
Dartmouth, NS, B3B 1W2
Phone: 9024661668 Fax: 9024661669
Client Project #: 1895674
AGAT Quotation: 204505
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Glen Merkley
Email: glen_merkley@golder.com
2. Name: Sheri Burton
Email: sheri_burton@golder.com

Report Format
☐ Single Sample per page
☑ Multiple Sample per page
☑ Excel Format Included
☐ Export:

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required:

Invoice To Same Yes ☑ / No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample:** ☐ Yes ☐ No
Reg. No.:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☑ Diss ☐ Available	Mercury (Total + Dissolved)	☐ DOC ☐ COD + DOC	pH	☑ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus + Dissolved-Nitrs.	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC+EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Total and Free Cyanide	Other: Radium-226	Hazardous (Y/N)
FMS-HG18-02A	Aug 5/18 - 2:00PM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-02B	Aug 5/18 - 2:30PM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-03A	Aug 5/18 - 4:00PM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-03B	Aug 5/18 - 4:30PM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-04A	Aug 6/18 - 12:30PM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-04B	Aug 6/18 - 1:00PM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-05A	Aug 5/18 - 5:00PM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-05B	Aug 6/18 - 9:00AM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-06A	Aug 5/18 - 12:00PM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-07A	Aug 6/18 - 1:30PM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-07B	Aug 6/18 - 2:00PM	GW	13	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓											✓	✓	
FMS-HG18-08A	Aug 4/18 - 6:00PM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	

Samples Relinquished By (Print Name)	Date/Time	Samples Received By (Print Name)	Date/Time
Glen Merkley	Sept. 7/18	Tim McCall	10:20
Samples Relinquished By (Sign)	**Date/Time**	**Samples Received By (Sign)**	**Date/Time**
G. Merkley	10:20am		07Sept

Pink Copy - Client
Yellow Copy - AGAT
White Copy- AGAT

Page 1 of 3
N°:

Document ID: DIV-133-I501.002 Date revised: January 2018

Copper RDL - 1.0 ug/L, Mercury RDL - 0.016 ug/L

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Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: _____
Hold Time: _____
AGAT Job Number: 18X382529
Notes:

Report Information
Company: Golder Associates
Contact: Glen Merkley
Address: 201 Brownlow Avenue, Suite 26
Dartmouth, NS, B3B 1W2
Phone: 9024661668 Fax: 9024661669
Client Project #: 1895674
AGAT Quotation: 204505
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Glen Merkley
Email: glen_merkley@golder.com
2. Name: Sheri Burton
Email: sheri_burton@golder.com

Report Format
☐ Single Sample per page
☑ Multiple Sample per page
☑ Excel Format Included
☐ Export:

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required: _____

Invoice To Same Yes ☑ / No ☐
Company: _____
Contact: _____
Address: _____
Phone: _____ Fax: _____
PO/Credit Card#: _____

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other _____

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample:** ☐ Yes ☐ No
Reg. No.: _____

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☑ Diss ☐ Available	Mercury (Total + Dissolved)	☐ BOD ☐ COD + DOC	pH	☑ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus + Dissolved - Miss.	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other:	Other: Radium-226	Hazardous (Y/N)
FMS-HG18-08B	Aug 5/18 - 9:00AM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-09A	Aug 6/18 - 11:00AM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-09B	Aug 6/18 - 11:30AM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-10A	Aug 5/18 - 11:00AM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-10B	Aug 5/18 - 11:30AM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-11A	Aug 4/18 - 5:00PM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-11B	Aug 4/18 - 5:30PM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-13A	Aug 5/18 - 10:00AM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-13B	Aug 5/18 - 10:30AM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-14A	Aug 5/18 - 12:30PM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-14B	Aug 5/18 - 1:00PM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-15A	Aug 6/18 - 3:30PM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	

Samples Relinquished By (Print Name)	Date/Time	Samples Received By (Print Name)	Date/Time
Glen Merkley	Aug. 7/18	Emma Quesnel	07 Sept
Samples Relinquished By (Sign)	**Date/Time**	**Samples Received By (Sign)**	**Date/Time**
	10:20am		10:20

Pink Copy - Client
Yellow Copy - AGAT
White Copy- AGAT

Page 2 of 3
N°:

Document ID: DIV-133-I601.002 Date revised: January 2016

Copper RDL – 1.0 ug/L, Mercury RDL – 0.016 ug/L

AGAT Laboratories
Unit 122 • 11 Morris Drive
Dartmouth, NS
B3B 1M2
webearth.agatlabs.com • www.agatlabs.com
P: 902.468.8718 • F: 902.468.8924

Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: _____
Hold Time: _____
AGAT Job Number: 18X382529
Notes:

Report Information
Company: Golder Associates
Contact: Glen Merkley
Address: 201 Brownlow Avenue, Suite 26
Dartmouth, NS, B3B 1W2
Phone: 9024661668 Fax: 9024661669
Client Project #: 1895674
AGAT Quotation: 204505
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Glen Merkley
Email: glen_merkley@golder.com
2. Name: Sheri Burton
Email: sheri_burton@golder.com

Report Format
☐ Single Sample per page
☑ Multiple Sample per page
☑ Excel Format Included
☐ Export:

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required: _____

Invoice To Same Yes ☑ / No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other _____

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample:** ☐ Yes ☐ No
Reg. No.: _____

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☑ Diss ☐ Available	Mercury (Total + Dissolved)	☐ BOD ~~☐ CBOD~~ COD + DOC	pH	☑ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus + Dissolved-Miss.	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Total and Free Cyanide	Other: Radium-226	Hazardous (Y/N)
FMS-HG18-15B	Aug 6/18 - 4:00PM	GW	13	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓											✓	✓	
FMS-HG18-16A	Aug 6/18 - 10:00AM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-16B	Aug 6/18 - 10:30AM	GW	13	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓											✓	✓	
DUP-A	Aug 5/18 - 1:00PM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
DUP-B	Aug 5/18 - 5:00PM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
DUP-C	Aug 6/18 - 11:00AM	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	

Samples Relinquished By (Print Name):	Date/Time	Samples Received By (Print Name):	Date/Time
Glen Merkley	Aug. 7/18	[illegible]	07 Sept
Samples Relinquished By (Sign):	Date/Time	Samples Received By (Sign):	Date/Time
[signature]	10:20am		10:20

Pink Copy - Client
Yellow Copy - AGAT
White Copy- AGAT

Page 3 of 3
N°:

Document ID: DW-133-1501.002
Date revised: January 2016

Copper RDL - 1.0 ug/L, Mercury RDL - 0.016 ug/L

SASKATCHEWAN RESEARCH COUNCIL

Environmental Analytical Laboratories
143-111 Research Drive, Saskatoon, SK Canada S7N 3R2

T: 306-933-6932 **F:** 306-933-7922
Toll-free: 1-800-240-8808
E: analytical@src.sk.ca

www.src.sk.ca/analytical

SRC Group # 2018-11183

Oct 03, 2018

AGAT Laboratories
122-11 Morris Drive
Dartmouth, NS B3B 1M2
Attn: Janetta Fraser

Date Samples Received: Sep-11-2018 Client P.O.: 120349

All results have been reviewed and approved by a Qualified Person in accordance with the Saskatchewan Environmental Code, Corrective Action Plan Chapter, for the purposes of certifying a laboratory analysis

Results from Lab Sections 1 and 2 have been authorized by Keith Gipman, Supervisor
Results from Lab Section 3 have been authorized by Pat Moser, Supervisor
Results from Lab Sections 4 and 5 have been authorized by Vicky Snook, Supervisor
Results from Lab Section 6 have been authorized by Marion McConnell, Supervisor

---

* Test methods and data are validated by the laboratory's Quality Assurance Program.

* Routine methods follow recognized procedures from sources such as
    * Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF
    * Environment Canada
    * US EPA
    * CANMET

* The results reported relate only to the test samples as provided by the client.

* Samples will be kept for 30 days after the final report is sent. Please contact the lab if you have any special requirements.

* Additional information is available upon request.

This is a final report.

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SRC Group # 2018-11183

Oct 03, 2018

AGAT Laboratories

122-11 Morris Drive
Dartmouth, NS B3B 1M2
Attn: Janetta Fraser

Date Samples Received: Sep-11-2018 Client P.O.: 120349

35577	**09/05/2018 18X382529-9528572J/K: FMS-HG18-02A *WATER***
35578	**09/05/2018 18X382529-9528577J/K: FMS-HG18-02B *WATER***
35579	**09/05/2018 18X382529-9528578J/K: FMS-HG18-03A *WATER***

Analyte	Units	35577	35578	35579
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.009	0.01	0.01

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SRC Group # 2018-11183

Oct 03, 2018

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35580	**09/05/2018 18X382529-9528579J/K: FMS-HG18-03B *WATER***
35581	**09/06/2018 18X382529-9528580J/K: FMS-HG18-04A *WATER***
35582	**09/06/2018 18X382529-9528581J/K: FMS-HG18-04B *WATER***

Analyte	Units	35580	35581	35582
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.01	0.006	0.006

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SRC Group # 2018-11183

Oct 03, 2018

AGAT Laboratories

35583	**09/05/2018 18X382529-9528582J/K: FMS-HG18-05A *WATER***
35584	**09/06/2018 18X382529-9528583J/K: FMS-HG18-05B *WATER***
35585	**09/05/2018 18X382529-9528584J/K: FMS-HG18-06A *WATER***

Analyte	Units	35583	35584	35585
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.01	0.03	0.01

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SRC Group # 2018-11183

Oct 03, 2018

AGAT Laboratories

35586	**09/06/2018 18X382529-9528585J/K: FMS-HG18-07A *WATER***
35587	**09/06/2018 18X382529-9528586J/K: FMS-HG18-07B *WATER***
35588	**09/05/2018 18X382529-9528587J/K: FMS-HG18-08A *WATER***

Analyte	Units	35586	35587	35588
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.01	0.01	0.01

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SRC Group # 2018-11183

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35589	**09/05/2018 18X382529-9528604J/K: FMS-HG18-08B *WATER***
35590	**09/06/2018 18X382529-9528605J/K: FMS-HG18-09A *WATER***
35591	**09/06/2018 18X382529-9528606J/K: FMS-HG18-09B *WATER***

Analyte	Units	35589	35590	35591
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.008	0.02	<0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

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SRC Group # 2018-11183

Oct 03, 2018

AGAT Laboratories

35592	**09/05/2018 18X382529-9528607J/K: FMS-HG18-10A *WATER***
35593	**09/05/2018 18X382529-9528608J/K: FMS-HG18-10B *WATER***
35594	**09/04/2018 18X382529-9528609J/K: FMS-HG18-11A *WATER***

Analyte	Units	35592	35593	35594
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.01	<0.005	0.01

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

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SRC Group # 2018-11183

Oct 03, 2018

AGAT Laboratories

35595	**09/04/2018 18X382529-9528610J/K: FMS-HG18-11B *WATER***
35596	**09/05/2018 18X382529-9528611J/K: FMS-HG18-13A *WATER***
35597	**09/05/2018 18X382529-9528612J/K: FMS-HG18-13B *WATER***

Analyte	Units	35595	35596	35597
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.01	0.007	0.01

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SRC Group # 2018-11183

Oct 03, 2018

AGAT Laboratories

35598	**09/05/2018 18X382529-9528613J/K: FMS-HG18-14A *WATER***
35599	**09/05/2018 18X382529-9528614J/K: FMS-HG18-14B *WATER***
35600	**09/06/2018 18X382529-9528615J/K: FMS-HG18-15A *WATER***

Analyte	Units	35598	35599	35600
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	0.007	0.01

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

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SRC Group # 2018-11183

Oct 03, 2018

AGAT Laboratories

35601	**09/06/2018 18X382529-9528771J/K: FMS-HG18-15B *WATER***
35602	**09/06/2018 18X382529-9528772J/K: FMS-HG18-16A *WATER***
35603	**09/06/2018 18X382529-9528773J/K: FMS-HG18-16B *WATER***

Analyte	Units	35601	35602	35603
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.03	0.01	0.01

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E: analytical@src.sk.ca

www.src.sk.ca/analytical

SRC Group # 2018-11183

Oct 03, 2018

AGAT Laboratories

35604 09/05/2018 18X382529-9528776J/K: DUP-A *WATER*
35605 09/05/2018 18X382529-9528777J/K: DUP-B *WATER*
35606 09/06/2018 18X382529-9528778J/K: DUP-C *WATER*

Analyte	Units	35604	35605	35606
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.005	0.01	0.02

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES
201 Brownlow Avenue, Suite 26
DARTMOUTH, NS B3B 1W2
(902) 466-1668

ATTENTION TO: Sheri Burton

PROJECT:

AGAT WORK ORDER: 18X411370

MISCELLANEOUS ANALYSIS REVIEWED BY: Jason Coughtrey, Inorganics Supervisor

TRACE ORGANICS REVIEWED BY: Amy Hunter, Trace Organics Supervisor, B.Sc.

WATER ANALYSIS REVIEWED BY: Jason Coughtrey, Inorganics Supervisor

DATE REPORTED: Dec 07, 2018

PAGES (INCLUDING COVER): 35

VERSION*: 2

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

*NOTES
VERSION 2:Version 2.0 supersedes version 1.0 - complete report

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA)
Western Enviro-Agricultural Laboratory Association (WEALA)
Environmental Services Association of Alberta (ESAA)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.

Results relate only to the items tested. Results apply to samples as received.
All reportable information as specified by ISO 17025:2017 is available from AGAT Laboratories upon request

AGAT Laboratories

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Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
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Certificate of Analysis

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Subcontracted Data Received

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

SAMPLE DESCRIPTION:				FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A	FMS-HG18-05B
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19	2018-11-19
Parameter	Unit	G / S	RDL	9717442	9717446	9717447	9717448	9717449	9717450	9717451	9717452
Subcontracted Data				y	y	y	y	y	y	y	y

SAMPLE DESCRIPTION:				FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-010A
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-11-19	2018-11-20	2018-11-20	2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19
Parameter	Unit	G / S	RDL	9717453	9717454	9717455	9717459	9717460	9717461	9717462	9717463
Subcontracted Data				y	y	y	y	y	y	y	y

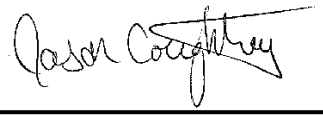
SAMPLE DESCRIPTION:				FMS-HG18-010B	FMS-HG18-011A	FMS-HG18-011B	FMS-HG18-013A	FMS-HG18-013B	FMS-HG18-014A	FMS-HG18-014B	FMS-HG18-015A
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-20
Parameter	Unit	G / S	RDL	9717464	9717465	9717466	9717467	9717468	9717469	9717470	9717471
Subcontracted Data				y	y	y	y	y	y	y	y

SAMPLE DESCRIPTION:				FMS-HG18-015B	FMS-HG18-016A	FMS-HG18-016B	DUP-1	DUP-2	DUP-3
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-11-20	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19
Parameter	Unit	G / S	RDL	9717631	9717633	9717634	9717636	9717637	9717638
Subcontracted Data				y	y	y	y	y	y

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:



Results relate only to the items tested. Results apply to samples as received.

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

SAMPLE DESCRIPTION:					FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19
Parameter	Unit	G / S: A	G / S: B	RDL	9717442	9717446	9717447	9717448	9717449	9717450	9717451
Benzene	mg/L	0.005	2.1	0.001	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Resemblance Comment					NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32					Y	Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits									
Isobutylbenzene - EPH	%	70-130			94	91	91	91	90	106	113
Isobutylbenzene - VPH	%	70-130			73	70	111	71	111	70	75
n-Dotriacontane - EPH	%	70-130			93	89	86	88	82	103	105

Certified By:

Results relate only to the items tested. Results apply to samples as received.

AGAT Laboratories

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CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

					SAMPLE DESCRIPTION:	FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19	2018-11-19	2018-11-20
Parameter	Unit	G / S: A	G / S: B	RDL		9717452	9717453	9717454	9717455	9717459	9717460	9717461
Benzene	mg/L	0.005	2.1	0.001		<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001		<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001		<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002		<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	0.1		<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Resemblance Comment						NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32						Y	Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits										
Isobutylbenzene - EPH	%	70-130				95	91	87	96	109	112	120
Isobutylbenzene - VPH	%	70-130				77	115	76	113	70	101	87
n-Dotriacontane - EPH	%	70-130				90	86	81	89	104	112	116

Certified By:

Results relate only to the items tested. Results apply to samples as received.

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

					SAMPLE DESCRIPTION:	FMS-HG18-09B	FMS-HG18-010A	FMS-HG18-010B	FMS-HG18-011A	FMS-HG18-011B	FMS-HG18-013A	FMS-HG18-013B
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2018-11-20	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19
Parameter	Unit	G / S: A	G / S: B	RDL		9717462	9717463	9717464	9717465	9717466	9717467	9717468
Benzene	mg/L	0.005	2.1	0.001		<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001		<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001		<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002		<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	0.1		<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Resemblance Comment						NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32						Y	Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits										
Isobutylbenzene - EPH	%	70-130				111	110	117	114	116	97	126
Isobutylbenzene - VPH	%	70-130				124	124	70	70	96	95	104
n-Dotriacontane - EPH	%	70-130				108	108	116	116	114	90	128

Certified By:

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CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

					SAMPLE DESCRIPTION:	FMS-HG18-014A	FMS-HG18-014B	FMS-HG18-015A	FMS-HG18-015B	FMS-HG18-016A	FMS-HG18-016B	DUP-1
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19	2018-11-19	2018-11-19
Parameter	Unit	G / S: A	G / S: B	RDL		9717469	9717470	9717471	9717631	9717633	9717634	9717636
Benzene	mg/L	0.005	2.1	0.001		<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001		<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001		<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002		<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	0.1		<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Resemblance Comment						NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32						Y	Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits										
Isobutylbenzene - EPH	%	70-130				124	105	111	111	124	127	120
Isobutylbenzene - VPH	%	70-130				102	106	109	100	104	107	108
n-Dotriacontane - EPH	%	70-130				128	107	113	114	124	127	124

Certified By:

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CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

					SAMPLE DESCRIPTION:	DUP-2	DUP-3
					SAMPLE TYPE:	Water	Water
					DATE SAMPLED:	2018-11-19	2018-11-19
Parameter	Unit	G / S: A	G / S: B	RDL		9717637	9717638
Benzene	mg/L	0.005	2.1	0.001		<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001		<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001		<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002		<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01		<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05		<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10		<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1		<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	0.1		<0.1[<B]	<0.1[<B]
Resemblance Comment						NR	NR
Return to Baseline at C32						Y	Y
Surrogate	Unit	Acceptable Limits					
Isobutylbenzene - EPH	%	70-130				109	118
Isobutylbenzene - VPH	%	70-130				110	103
n-Dotriacontane - EPH	%	70-130				113	122

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Canadian Drinking Water Quality - updated 2017-05, B Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9717442-9717638 Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Free & Total CN (Water)

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

				SAMPLE DESCRIPTION:	FMS-HG18-07B	FMS-HG18-015B	FMS-HG18-016B
				SAMPLE TYPE:	Water	Water	Water
				DATE SAMPLED:	2018-11-20	2018-11-20	2018-11-19
Parameter	Unit	G / S	RDL		9717455	9717631	9717634
Cyanide, Free	mg/L		0.002		<0.002	<0.002	<0.002
Total Cyanide	mg/L	0.005	0.002		<0.002	<0.002	<0.002

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Certified By:

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Mercury Analysis in Water (Dissolved)

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

				SAMPLE DESCRIPTION:	FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19
Parameter	Unit	G / S: A	G / S: B	RDL	9717442	9717446	9717447	9717448	9717449	9717450	9717451
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

				SAMPLE DESCRIPTION:	FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19	2018-11-19	2018-11-20
Parameter	Unit	G / S: A	G / S: B	RDL	9717452	9717453	9717454	9717455	9717459	9717460	9717461
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

				SAMPLE DESCRIPTION:	FMS-HG18-09B	FMS-HG18-010A	FMS-HG18-010B	FMS-HG18-011A	FMS-HG18-011B	FMS-HG18-013A	FMS-HG18-013B
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2018-11-20	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19
Parameter	Unit	G / S: A	G / S: B	RDL	9717462	9717463	9717464	9717465	9717466	9717467	9717468
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

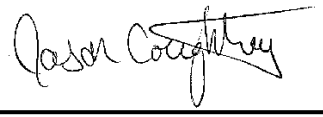
				SAMPLE DESCRIPTION:	FMS-HG18-014A	FMS-HG18-014B	FMS-HG18-015A	FMS-HG18-015B	FMS-HG18-016A	FMS-HG18-016B	DUP-1
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19	2018-11-19	2018-11-19
Parameter	Unit	G / S: A	G / S: B	RDL	9717469	9717470	9717471	9717631	9717633	9717634	9717636
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	0.062[B-A]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

				SAMPLE DESCRIPTION:	DUP-2	DUP-3
				SAMPLE TYPE:	Water	Water
				DATE SAMPLED:	2018-11-19	2018-11-19
Parameter	Unit	G / S: A	G / S: B	RDL	9717637	9717638
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Canadian Drinking Water Quality - updated 2017-05, B Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:



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AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

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AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Mercury Analysis in Water (Total)

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

SAMPLE DESCRIPTION:					FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19
Parameter	Unit	G / S: A	G / S: B	RDL	9717442	9717446	9717447	9717448	9717449	9717450	9717451
Total Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

SAMPLE DESCRIPTION:					FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19	2018-11-19	2018-11-20
Parameter	Unit	G / S: A	G / S: B	RDL	9717452	9717453	9717454	9717455	9717459	9717460	9717461
Total Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

SAMPLE DESCRIPTION:					FMS-HG18-09B	FMS-HG18-010A	FMS-HG18-010B	FMS-HG18-011A	FMS-HG18-011B	FMS-HG18-013A	FMS-HG18-013B
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-11-20	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19
Parameter	Unit	G / S: A	G / S: B	RDL	9717462	9717463	9717464	9717465	9717466	9717467	9717468
Total Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

SAMPLE DESCRIPTION:					FMS-HG18-014A	FMS-HG18-014B	FMS-HG18-015A	FMS-HG18-015B	FMS-HG18-016A	FMS-HG18-016B	DUP-1
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19	2018-11-19	2018-11-19
Parameter	Unit	G / S: A	G / S: B	RDL	9717469	9717470	9717471	9717631	9717633	9717634	9717636
Total Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	0.164[B-A]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

SAMPLE DESCRIPTION:					DUP-2	DUP-3
SAMPLE TYPE:					Water	Water
DATE SAMPLED:					2018-11-19	2018-11-19
Parameter	Unit	G / S: A	G / S: B	RDL	9717637	9717638
Total Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Canadian Drinking Water Quality - updated 2017-05, B Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016
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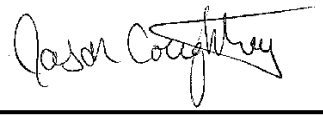
Analysis performed at AGAT Halifax (unless marked by *)

Certified By:



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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

SAMPLE DESCRIPTION:					FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19
Parameter	Unit	G / S: A	G / S: B	RDL	9717442	9717446	9717447	9717448	9717449	9717450	9717451
pH		7.0-10.5 OG			8.05	6.32	7.56	7.08	8.21	7.02	6.58
Reactive Silica as SiO2	mg/L			0.5	9.5	3.8	13.0	5.3	10.5	8.1	8.1
Chloride	mg/L	250 AO		1	4	4	3	2	2	3	3
Fluoride	mg/L	1.5		0.12	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	0.16[<A]	<0.12[<A]	<0.12[<A]
Sulphate	mg/L	500 AO		2	15	<2	9	<2	7	<2	3
Alkalinity	mg/L			5	69	<5	33	12	141	39	11
True Color	TCU	15 AO		5	<5	<5	7	<5	5	<5	7
Turbidity	NTU	0.1-1		0.1	6.8	28.1	9.8	185	5.5	78.8	11.1
Electrical Conductivity	umho/cm			1	179	34	102	42	292	91	56
Nitrate + Nitrite as N	mg/L			0.05	0.06	<0.05	0.11	0.06	<0.05	<0.05	0.38
Nitrate as N	mg/L	10		0.05	0.06[<A]	<0.05[<A]	0.11[<A]	0.06[<A]	<0.05[<A]	<0.05[<A]	0.38[<A]
Nitrite as N	mg/L	1.0		0.05	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Ammonia as N	mg/L			0.03	0.05	0.03	0.03	0.05	0.04	0.07	0.04
Total Organic Carbon	mg/L			0.5	0.8	1.2	2.0	1.0	<0.5	<0.5	1.4
Ortho-Phosphate as P	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L	200 AO		0.1	6.0	3.2	8.1	5.8	43.1	5.8	2.9
Dissolved Potassium	mg/L			0.1	1.7	0.7	1.4	0.8	2.4	1.2	3.2
Dissolved Calcium	mg/L			0.1	21.7	1.0	10.0	1.2	21.5	4.5	4.3
Dissolved Magnesium	mg/L			0.1	2.3	0.5	0.7	0.3	3.8	1.1	0.9
Bicarb. Alkalinity (as CaCO3)	mg/L			5	69	<5	33	12	141	39	11
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L			5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L	500 AO		1	93	10	53	18	165	47	26
Hardness	mg/L				63.7	4.6	27.9	4.2	69.3	15.8	14.4
Langelier Index (@20C)	NA				-0.36	-4.49	-1.48	-3.27	0.08	-2.29	-3.27
Langelier Index (@ 4C)	NA				-0.68	-4.81	-1.80	-3.59	-0.24	-2.61	-3.59
Saturation pH (@ 20C)	NA				8.41	10.8	9.04	10.4	8.13	9.31	9.85
Saturation pH (@ 4C)	NA				8.73	11.1	9.36	10.7	8.45	9.63	10.2
Anion Sum	me/L				1.81	0.11	0.94	0.30	3.02	0.86	0.39
Cation sum	me/L				1.59	0.27	0.99	0.39	3.34	0.88	0.50

Certified By:

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AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
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AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

Parameter	Unit	G / S: A	G / S: B	RDL	SAMPLE DESCRIPTION: FMS-HG18-02A SAMPLE TYPE: Water DATE SAMPLED: 2018-11-19 9717442	FMS-HG18-02B Water 2018-11-19 9717446	FMS-HG18-03A Water 2018-11-19 9717447	FMS-HG18-03B Water 2018-11-19 9717448	FMS-HG18-04A Water 2018-11-20 9717449	FMS-HG18-04B Water 2018-11-20 9717450	FMS-HG18-05A Water 2018-11-19 9717451
% Difference/ Ion Balance	%				6.6	41.1	2.6	13.1	4.9	0.6	11.9
Dissolved Aluminum	ug/L	100 OG AO	5	5	6[>B]	88[>B]	295[>B]	224[>B]	6[>B]	<5[<B]	7[>B]
Dissolved Antimony	ug/L	6	20	2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Arsenic	ug/L	10	5.0	2	10[A]	<2[<B]	23[>A]	<2[<B]	38[>A]	<2[<B]	15[>A]
Dissolved Barium	ug/L	1000	1000	5	8[<A]	14[<A]	7[<A]	5[<A]	9[<A]	19[<A]	11[<A]
Dissolved Beryllium	ug/L		5.3	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Bismuth	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	5000	1200	5	13[<B]	<5[<B]	6[<B]	5[<B]	18[<B]	<5[<B]	8[<B]
Dissolved Cadmium	ug/L	5	0.01	0.017	<0.017[<A]	0.017[B-A]	<0.017[<A]	<0.017[<A]	<0.017[<A]	0.060[B-A]	<0.017[<A]
Dissolved Chromium	ug/L	50	-	1	<1[<A]	<1[<A]	<1[<A]	<1[<A]	2[<A]	1[<A]	1[<A]
Dissolved Cobalt	ug/L		10	1	<1[<B]	2[<B]	<1[<B]	2[<B]	<1[<B]	6[<B]	<1[<B]
Dissolved Copper	ug/L	1000 AO	2	1	2[B]	9[>B]	<1[<B]	1[<B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Iron	ug/L	300 AO	300	50	<50[<B]	68[<B]	86[<B]	52[<B]	<50[<B]	1750[>B]	<50[<B]
Dissolved Lead	ug/L	10	1	0.5	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]
Dissolved Manganese	ug/L	50 AO	820	2	112[<B]	193[<B]	201[<B]	92[<B]	288[<B]	1470[>B]	5[<B]
Dissolved Molybdenum	ug/L		73	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	8[<B]	<2[<B]	<2[<B]
Dissolved Nickel	ug/L		25	2	<2[<B]	7[<B]	<2[<B]	8[<B]	<2[<B]	5[<B]	2[<B]
Dissolved Phosphorus	mg/L			0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	50	1.0	1	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Silver	ug/L		0.1	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Strontium	ug/L		21000	5	175[<B]	11[<B]	47[<B]	9[<B]	136[<B]	21[<B]	25[<B]
Dissolved Thallium	ug/L		0.8	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Tin	ug/L		-	2	<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L			2	<2	<2	7	3	<2	<2	<2
Dissolved Uranium	ug/L	20	300	0.1	2.6[<A]	<0.1[<A]	0.9[<A]	<0.1[<A]	9.3[<A]	<0.1[<A]	<0.1[<A]
Dissolved Vanadium	ug/L		6	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Zinc	ug/L	5000 AO	30	5	<5[<B]	<5[<B]	<5[<B]	10[<B]	<5[<B]	5150[>B]	<5[<B]

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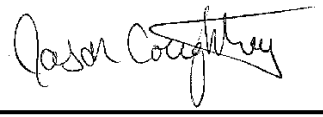

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AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

SAMPLE DESCRIPTION:					FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19	2018-11-19	2018-11-20
Parameter	Unit	G / S: A	G / S: B	RDL	9717452	9717453	9717454	9717455	9717459	9717460	9717461
pH		7.0-10.5 OG			6.67	6.34	8.00	6.49	7.33	6.27	7.74
Reactive Silica as SiO2	mg/L			0.5	6.0	11.4	13.9	6.2	8.3	3.5	17.4
Chloride	mg/L	250 AO		1	2	8	3	4	2	3	3
Fluoride	mg/L	1.5		0.12	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]
Sulphate	mg/L	500 AO		2	3	12	2	<2	2	<2	3
Alkalinity	mg/L			5	10	10	98	14	28	5	75
True Color	TCU	15 AO		5	23	<5	<5	434	11	17	<5
Turbidity	NTU	0.1-1		0.1	51.8	5.2	5.2	40.3	39.6	48.2	5.0
Electrical Conductivity	umho/cm			1	56	102	207	60	71	32	171
Nitrate + Nitrite as N	mg/L			0.05	2.18	0.19	<0.05	<0.05	<0.05	0.10	<0.05
Nitrate as N	mg/L	10		0.05	2.18[<A]	0.19[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	0.10[<A]	<0.05[<A]
Nitrite as N	mg/L	1.0		0.05	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Ammonia as N	mg/L			0.03	0.03	0.04	0.03	0.11	0.04	0.03	0.04
Total Organic Carbon	mg/L			0.5	1.8	1.3	2.8	26.8	1.3	2.9	<0.5
Ortho-Phosphate as P	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L	200 AO		0.1	5.5	4.5	7.5	6.9	3.3	3.6	5.1
Dissolved Potassium	mg/L			0.1	1.5	1.9	2.1	0.7	0.8	0.5	1.4
Dissolved Calcium	mg/L			0.1	2.7	10.1	30.3	3.4	7.4	1.2	27.5
Dissolved Magnesium	mg/L			0.1	0.4	0.8	2.1	0.6	0.7	0.3	1.0
Bicarb. Alkalinity (as CaCO3)	mg/L			5	10	10	98	14	28	5	75
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L			5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L	500 AO		1	31	45	106	35	33	12	86
Hardness	mg/L				8.4	28.5	84.3	11.0	21.4	4.2	72.8
Langelier Index (@20C)	NA				-3.43	-3.21	-0.12	-3.37	-1.89	-4.45	-0.53
Langelier Index (@ 4C)	NA				-3.75	-3.53	-0.44	-3.69	-2.21	-4.77	-0.85
Saturation pH (@ 20C)	NA				10.1	9.55	8.12	9.86	9.22	10.7	8.27
Saturation pH (@ 4C)	NA				10.4	9.87	8.44	10.2	9.54	11.0	8.59
Anion Sum	me/L				0.47	0.69	2.09	0.39	0.66	0.19	1.65
Cation sum	me/L				0.45	0.83	2.09	0.98	0.60	0.27	1.73

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Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-11-20

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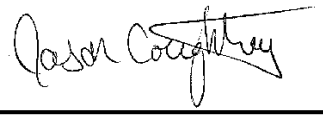
SAMPLE DESCRIPTION:					FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19	2018-11-19	2018-11-20
Parameter	Unit	G / S: A	G / S: B	RDL	9717452	9717453	9717454	9717455	9717459	9717460	9717461
% Difference/ Ion Balance	%				2.4	9.3	0.1	42.8	5.0	16.5	2.6
Dissolved Aluminum	ug/L	100 OG AO	5	5	10[>B]	14[>B]	<5[<B]	820[>B]	<5[<B]	58[>B]	<5[<B]
Dissolved Antimony	ug/L	6	20	2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Arsenic	ug/L	10	5.0	2	4[<B]	<2[<B]	16[>A]	25[>A]	<2[<B]	<2[<B]	<2[<B]
Dissolved Barium	ug/L	1000	1000	5	5[<A]	18[<A]	20[<A]	13[<A]	5[<A]	6[<A]	16[<A]
Dissolved Beryllium	ug/L		5.3	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Bismuth	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	5000	1200	5	6[<B]	9[<B]	14[<B]	6[<B]	7[<B]	5[<B]	8[<B]
Dissolved Cadmium	ug/L	5	0.01	0.017	0.030[B-A]	0.094[B-A]	<0.017[<A]	<0.017[<A]	<0.017[<A]	0.029[B-A]	<0.017[<A]
Dissolved Chromium	ug/L	50	-	1	<1[<A]	<1[<A]	2[<A]	2[<A]	<1[<A]	<1[<A]	1[<A]
Dissolved Cobalt	ug/L		10	1	3[<B]	9[<B]	<1[<B]	2[<B]	<1[<B]	2[<B]	<1[<B]
Dissolved Copper	ug/L	1000 AO	2	1	4[>B]	1[<B]	<1[<B]	2[B]	1[<B]	1[<B]	<1[<B]
Dissolved Iron	ug/L	300 AO	300	50	<50[<B]	<50[<B]	<50[<B]	9160[>B]	<50[<B]	<50[<B]	<50[<B]
Dissolved Lead	ug/L	10	1	0.5	<0.5[<B]	<0.5[<B]	<0.5[<B]	0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]
Dissolved Manganese	ug/L	50 AO	820	2	92[<B]	306[<B]	613[<B]	402[<B]	32[<B]	129[<B]	442[<B]
Dissolved Molybdenum	ug/L		73	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Nickel	ug/L		25	2	14[<B]	7[<B]	3[<B]	3[<B]	<2[<B]	2[<B]	2[<B]
Dissolved Phosphorus	mg/L			0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	50	1.0	1	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Silver	ug/L		0.1	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	0.1[B]	<0.1[<B]
Dissolved Strontium	ug/L		21000	5	17[<B]	47[<B]	192[<B]	18[<B]	36[<B]	10[<B]	97[<B]
Dissolved Thallium	ug/L		0.8	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Tin	ug/L		-	2	<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L			2	<2	<2	<2	12	<2	<2	<2
Dissolved Uranium	ug/L	20	300	0.1	<0.1[<A]	<0.1[<A]	2.3[<A]	0.3[<A]	0.2[<A]	<0.1[<A]	0.9[<A]
Dissolved Vanadium	ug/L		6	2	<2[<B]	<2[<B]	<2[<B]	4[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Zinc	ug/L	5000 AO	30	5	16[<B]	5[<B]	<5[<B]	6[<B]	<5[<B]	<5[<B]	<5[<B]

Certified By:



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SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

SAMPLE DESCRIPTION:					FMS-HG18-09B	FMS-HG18-010A	FMS-HG18-010B	FMS-HG18-011A	FMS-HG18-011B	FMS-HG18-013A	FMS-HG18-013B
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-11-20	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19
Parameter	Unit	G / S: A	G / S: B	RDL	9717462	9717463	9717464	9717465	9717466	9717467	9717468
pH		7.0-10.5 OG			6.78	8.03	6.61	6.69	6.11	6.71	6.49
Reactive Silica as SiO2	mg/L			0.5	10.4	10.7	4.5	8.2	3.9	6.9	3.8
Chloride	mg/L	250 AO		1	5	3	4	4	9	3	3
Fluoride	mg/L	1.5		0.12	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]
Sulphate	mg/L	500 AO		2	3	12	2	4	11	2	<2
Alkalinity	mg/L			5	23	66	8	50	36	11	5
True Color	TCU	15 AO		5	13	<5	6	18	5	5	6
Turbidity	NTU	0.1-1		0.1	41.7	16.5	21.4	3.2	17.8	3.7	30.4
Electrical Conductivity	umho/cm			1	68	174	43	132	145	41	30
Nitrate + Nitrite as N	mg/L			0.05	0.09	<0.05	0.18	0.40	0.30	0.10	0.09
Nitrate as N	mg/L	10		0.05	0.09[<A]	<0.05[<A]	0.18[<A]	0.40[<A]	0.30[<A]	0.10[<A]	0.09[<A]
Nitrite as N	mg/L	1.0		0.05	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Ammonia as N	mg/L			0.03	<0.03	0.05	0.03	<0.03	<0.03	0.03	0.03
Total Organic Carbon	mg/L			0.5	1.2	<0.5	0.8	1.1	4.2	0.8	0.8
Ortho-Phosphate as P	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L	200 AO		0.1	3.7	6.2	2.9	5.0	3.1	3.1	2.4
Dissolved Potassium	mg/L			0.1	0.8	1.4	0.3	1.1	0.2	0.5	0.4
Dissolved Calcium	mg/L			0.1	4.5	22.6	3.8	15.8	2.6	3.3	1.4
Dissolved Magnesium	mg/L			0.1	0.6	1.6	0.5	1.4	1.6	0.5	0.5
Bicarb. Alkalinity (as CaCO3)	mg/L			5	23	66	8	50	36	11	5
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L			5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L	500 AO		1	32	87	19	66	72	19	11
Hardness	mg/L				13.7	63.0	11.5	45.2	13.1	10.3	5.6
Langelier Index (@20C)	NA				-2.74	-0.38	-3.42	-1.98	-3.49	-3.25	-4.16
Langelier Index (@ 4C)	NA				-3.06	-0.70	-3.74	-2.30	-3.81	-3.57	-4.48
Saturation pH (@ 20C)	NA				9.52	8.41	10.0	8.67	9.60	9.96	10.6
Saturation pH (@ 4C)	NA				9.84	8.73	10.4	8.99	9.92	10.3	11.0
Anion Sum	me/L				0.67	1.65	0.33	1.22	1.22	0.35	0.19
Cation sum	me/L				0.47	1.57	0.37	1.25	1.20	0.36	0.24

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

					SAMPLE DESCRIPTION:	FMS-HG18-09B	FMS-HG18-010A	FMS-HG18-010B	FMS-HG18-011A	FMS-HG18-011B	FMS-HG18-013A	FMS-HG18-013B
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2018-11-20	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19
Parameter	Unit	G / S: A	G / S: B	RDL		9717462	9717463	9717464	9717465	9717466	9717467	9717468
% Difference/ Ion Balance	%					17.9	2.5	6.6	0.9	1.0	0.5	11.0
Dissolved Aluminum	ug/L	100 OG AO	5	5		<5[<B]	10[>B]	55[>B]	<5[<B]	334[>B]	10[>B]	77[>B]
Dissolved Antimony	ug/L	6	20	2		<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Arsenic	ug/L	10	5.0	2		<2[<B]	3[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Barium	ug/L	1000	1000	5		10[<A]	10[<A]	<5[<A]	6[<A]	13[<A]	<5[<A]	8[<A]
Dissolved Beryllium	ug/L		5.3	2		<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Bismuth	ug/L			2		<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	5000	1200	5		<5[<B]	19[<B]	5[<B]	7[<B]	5[<B]	<5[<B]	6[<B]
Dissolved Cadmium	ug/L	5	0.01	0.017		0.038[B-A]	<0.017[<A]	<0.017[<A]	0.087[B-A]	0.197[B-A]	<0.017[<A]	<0.017[<A]
Dissolved Chromium	ug/L	50	-	1		1[<A]	1[<A]	<1[<A]	2[<A]	6[<A]	<1[<A]	<1[<A]
Dissolved Cobalt	ug/L		10	1		<1[<B]	<1[<B]	<1[<B]	<1[<B]	28[>B]	<1[<B]	<1[<B]
Dissolved Copper	ug/L	1000 AO	2	1		21[>B]	<1[<B]	1[<B]	<1[<B]	6[>B]	<1[<B]	3[>B]
Dissolved Iron	ug/L	300 AO	300	50		<50[<B]	<50[<B]	<50[<B]	<50[<B]	3770[>B]	<50[<B]	<50[<B]
Dissolved Lead	ug/L	10	1	0.5		<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	0.9[<B]	<0.5[<B]	<0.5[<B]
Dissolved Manganese	ug/L	50 AO	820	2		283[<B]	95[<B]	17[<B]	2670[>B]	17200[>B]	8[<B]	47[<B]
Dissolved Molybdenum	ug/L		73	2		<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Nickel	ug/L		25	2		4[<B]	<2[<B]	<2[<B]	<2[<B]	4[<B]	<2[<B]	<2[<B]
Dissolved Phosphorus	mg/L			0.02		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	50	1.0	1		<1[<B]	<1[<B]	<1[<B]	1[B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Silver	ug/L		0.1	0.1		<0.1[<B]	<0.1[<B]	0.1[B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	0.6[>B]
Dissolved Strontium	ug/L		21000	5		35[<B]	127[<B]	14[<B]	82[<B]	15[<B]	26[<B]	14[<B]
Dissolved Thallium	ug/L		0.8	0.1		<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Tin	ug/L		-	2		<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L			2		<2	<2	<2	<2	<2	<2	<2
Dissolved Uranium	ug/L	20	300	0.1		<0.1[<A]	0.6[<A]	<0.1[<A]	0.4[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dissolved Vanadium	ug/L		6	2		<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Zinc	ug/L	5000 AO	30	5		10[<B]	<5[<B]	<5[<B]	<5[<B]	12[<B]	<5[<B]	<5[<B]

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CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

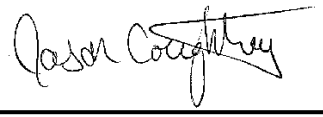
Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

SAMPLE DESCRIPTION:					FMS-HG18-014A	FMS-HG18-014B	FMS-HG18-015A	FMS-HG18-015B	FMS-HG18-016A	FMS-HG18-016B	DUP-1
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19	2018-11-19	2018-11-19
Parameter	Unit	G / S: A	G / S: B	RDL	9717469	9717470	9717471	9717631	9717633	9717634	9717636
pH		7.0-10.5 OG			7.48	6.54	8.08	7.84	7.97	6.11	7.59
Reactive Silica as SiO2	mg/L			0.5	6.8	5.0	8.8	9.5	14.7	4.3	7.2
Chloride	mg/L	250 AO		1	11	9	3	3	3	5	10
Fluoride	mg/L	1.5		0.12	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]
Sulphate	mg/L	500 AO		2	8	3	11	8	9	2	8
Alkalinity	mg/L			5	62	11	80	61	56	<5	62
True Color	TCU	15 AO		5	<5	<5	<5	<5	13	<5	10
Turbidity	NTU	0.1-1		0.1	14.2	19.5	2.2	20.8	17.9	29.1	14.5
Electrical Conductivity	umho/cm			1	191	75	197	153	150	36	195
Nitrate + Nitrite as N	mg/L			0.05	0.10	0.14	<0.05	<0.05	<0.05	<0.05	0.09
Nitrate as N	mg/L	10		0.05	0.10[<A]	0.14[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	0.09[<A]
Nitrite as N	mg/L	1.0		0.05	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Ammonia as N	mg/L			0.03	0.03	<0.03	0.03	0.03	0.03	0.03	0.03
Total Organic Carbon	mg/L			0.5	<0.5	0.9	<0.5	<0.5	<0.5	1.0	<0.5
Ortho-Phosphate as P	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L	200 AO		0.1	6.0	5.9	6.7	4.9	5.3	3.8	5.6
Dissolved Potassium	mg/L			0.1	1.5	0.9	1.0	0.9	1.4	0.7	1.4
Dissolved Calcium	mg/L			0.1	29.6	4.3	31.7	23.2	17.6	1.0	24.0
Dissolved Magnesium	mg/L			0.1	1.5	0.9	2.1	1.1	2.0	0.6	1.4
Bicarb. Alkalinity (as CaCO3)	mg/L			5	62	11	80	61	56	<5	62
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L			5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L	500 AO		1	95	32	104	78	72	13	88
Hardness	mg/L				80.1	14.4	87.8	62.5	52.2	5.0	65.7
Langelier Index (@20C)	NA				-0.84	-3.32	-0.10	-0.59	-0.61	-4.70	-0.82
Langelier Index (@ 4C)	NA				-1.16	-3.64	-0.42	-0.91	-0.93	-5.02	-1.14
Saturation pH (@ 20C)	NA				8.32	9.86	8.18	8.43	8.58	10.8	8.41
Saturation pH (@ 4C)	NA				8.64	10.2	8.50	8.75	8.90	11.1	8.73
Anion Sum	me/L				1.72	0.55	1.91	1.47	1.39	0.18	1.70
Cation sum	me/L				1.91	0.59	2.08	1.50	1.32	0.31	1.60

Certified By:



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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
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Certificate of Analysis

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

					SAMPLE DESCRIPTION:	FMS-HG18-014A	FMS-HG18-014B	FMS-HG18-015A	FMS-HG18-015B	FMS-HG18-016A	FMS-HG18-016B	DUP-1
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19	2018-11-19	2018-11-19
Parameter	Unit	G / S: A	G / S: B	RDL		9717469	9717470	9717471	9717631	9717633	9717634	9717636
% Difference/ Ion Balance	%					5.0	4.1	4.3	1.0	2.7	25.9	2.9
Dissolved Aluminum	ug/L	100 OG AO	5	5		<5[<B]	191[>B]	16[>B]	<5[<B]	5[B]	211[>B]	6[>B]
Dissolved Antimony	ug/L	6	20	2		<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Arsenic	ug/L	10	5.0	2		4[<B]	<2[<B]	16[>A]	4[<B]	<2[<B]	<2[<B]	4[<B]
Dissolved Barium	ug/L	1000	1000	5		6[<A]	22[<A]	<5[<A]	8[<A]	<5[<A]	16[<A]	6[<A]
Dissolved Beryllium	ug/L		5.3	2		<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Bismuth	ug/L			2		<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	5000	1200	5		6[<B]	6[<B]	7[<B]	6[<B]	8[<B]	6[<B]	5[<B]
Dissolved Cadmium	ug/L	5	0.01	0.017		0.029[B-A]	0.083[B-A]	<0.017[<A]	<0.017[<A]	<0.017[<A]	0.019[B-A]	0.023[B-A]
Dissolved Chromium	ug/L	50	-	1		1[<A]	1[<A]	1[<A]	1[<A]	<1[<A]	<1[<A]	2[<A]
Dissolved Cobalt	ug/L		10	1		<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Copper	ug/L	1000 AO	2	1		<1[<B]	3[>B]	<1[<B]	2[B]	<1[<B]	4[>B]	1[<B]
Dissolved Iron	ug/L	300 AO	300	50		<50[<B]	<50[<B]	<50[<B]	<50[<B]	<50[<B]	<50[<B]	<50[<B]
Dissolved Lead	ug/L	10	1	0.5		<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]
Dissolved Manganese	ug/L	50 AO	820	2		29[<B]	86[<B]	176[<B]	358[<B]	177[<B]	43[<B]	29[<B]
Dissolved Molybdenum	ug/L		73	2		<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Nickel	ug/L		25	2		3[<B]	5[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	3[<B]
Dissolved Phosphorus	mg/L			0.02		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	50	1.0	1		<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Silver	ug/L		0.1	0.1		<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	1.7[>B]	<0.1[<B]
Dissolved Strontium	ug/L		21000	5		74[<B]	24[<B]	92[<B]	47[<B]	78[<B]	17[<B]	74[<B]
Dissolved Thallium	ug/L		0.8	0.1		<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Tin	ug/L		-	2		<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L			2		<2	<2	<2	<2	<2	<2	<2
Dissolved Uranium	ug/L	20	300	0.1		0.2[<A]	<0.1[<A]	1.2[<A]	0.3[<A]	0.3[<A]	<0.1[<A]	0.2[<A]
Dissolved Vanadium	ug/L		6	2		<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Zinc	ug/L	5000 AO	30	5		<5[<B]	<5[<B]	<5[<B]	<5[<B]	<5[<B]	<5[<B]	<5[<B]

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Certificate of Analysis

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

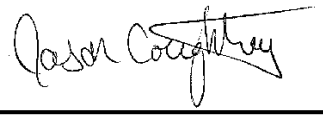
Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

Parameter	Unit	G / S: A	G / S: B	RDL	SAMPLE DESCRIPTION: DUP-2 SAMPLE TYPE: Water DATE SAMPLED: 2018-11-19 9717637	SAMPLE DESCRIPTION: DUP-3 SAMPLE TYPE: Water DATE SAMPLED: 2018-11-19 9717638
pH		7.0-10.5 OG			6.58	6.73
Reactive Silica as SiO2	mg/L			0.5	5.0	5.9
Chloride	mg/L	250 AO		1	9	2
Fluoride	mg/L	1.5		0.12	<0.12[<A]	<0.12[<A]
Sulphate	mg/L	500 AO		2	3	2
Alkalinity	mg/L			5	10	10
True Color	TCU	15 AO		5	8	<5
Turbidity	NTU	0.1-1		0.1	13.3	45.6
Electrical Conductivity	umho/cm			1	74	56
Nitrate + Nitrite as N	mg/L			0.05	0.13	1.57
Nitrate as N	mg/L	10		0.05	0.13[<A]	1.57[<A]
Nitrite as N	mg/L	1.0		0.05	<0.05[<A]	<0.05[<A]
Ammonia as N	mg/L			0.03	<0.03	0.03
Total Organic Carbon	mg/L			0.5	1.0	1.6
Ortho-Phosphate as P	mg/L			0.01	<0.01	<0.01
Dissolved Sodium	mg/L	200 AO		0.1	5.6	6.3
Dissolved Potassium	mg/L			0.1	0.9	1.8
Dissolved Calcium	mg/L			0.1	4.0	2.8
Dissolved Magnesium	mg/L			0.1	0.8	0.5
Bicarb. Alkalinity (as CaCO3)	mg/L			5	10	10
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10
Hydroxide	mg/L			5	<5	<5
Calculated TDS	mg/L	500 AO		1	30	29
Hardness	mg/L				13.3	9.1
Langelier Index (@20C)	NA				-3.35	-3.36
Langelier Index (@ 4C)	NA				-3.67	-3.68
Saturation pH (@ 20C)	NA				9.93	10.1
Saturation pH (@ 4C)	NA				10.3	10.4
Anion Sum	me/L				0.53	0.41
Cation sum	me/L				0.56	0.51

Certified By:



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AGAT Laboratories
11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

Parameter	Unit	G / S: A	G / S: B	RDL	SAMPLE DESCRIPTION: DUP-2 SAMPLE TYPE: Water DATE SAMPLED: 2018-11-19 9717637	SAMPLE DESCRIPTION: DUP-3 SAMPLE TYPE: Water DATE SAMPLED: 2018-11-19 9717638
% Difference/ Ion Balance	%				2.8	10.7
Dissolved Aluminum	ug/L	100 OG AO	5	5	185[>B]	11[>B]
Dissolved Antimony	ug/L	6	20	2	<2[<A]	<2[<A]
Dissolved Arsenic	ug/L	10	5.0	2	<2[<B]	5[B]
Dissolved Barium	ug/L	1000	1000	5	22[<A]	6[<A]
Dissolved Beryllium	ug/L		5.3	2	<2[<B]	<2[<B]
Dissolved Bismuth	ug/L			2	<2	<2
Dissolved Boron	ug/L	5000	1200	5	6[<B]	6[<B]
Dissolved Cadmium	ug/L	5	0.01	0.017	0.097[B-A]	0.037[B-A]
Dissolved Chromium	ug/L	50	-	1	2[<A]	<1[<A]
Dissolved Cobalt	ug/L		10	1	<1[<B]	3[<B]
Dissolved Copper	ug/L	1000 AO	2	1	2[B]	5[>B]
Dissolved Iron	ug/L	300 AO	300	50	<50[<B]	<50[<B]
Dissolved Lead	ug/L	10	1	0.5	<0.5[<B]	<0.5[<B]
Dissolved Manganese	ug/L	50 AO	820	2	84[<B]	96[<B]
Dissolved Molybdenum	ug/L		73	2	<2[<B]	<2[<B]
Dissolved Nickel	ug/L		25	2	5[<B]	15[<B]
Dissolved Phosphorus	mg/L			0.02	<0.02	<0.02
Dissolved Selenium	ug/L	50	1.0	1	<1[<B]	<1[<B]
Dissolved Silver	ug/L		0.1	0.1	<0.1[<B]	<0.1[<B]
Dissolved Strontium	ug/L		21000	5	24[<B]	18[<B]
Dissolved Thallium	ug/L		0.8	0.1	<0.1[<B]	<0.1[<B]
Dissolved Tin	ug/L		-	2	<2	<2
Dissolved Titanium	ug/L			2	<2	<2
Dissolved Uranium	ug/L	20	300	0.1	<0.1[<A]	<0.1[<A]
Dissolved Vanadium	ug/L		6	2	<2[<B]	<2[<B]
Dissolved Zinc	ug/L	5000 AO	30	5	<5[<B]	16[<B]

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Certificate of Analysis

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

Comments:	RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Canadian Drinking Water Quality - updated 2017-05, B Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016 Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.
9717442	Metals analysis completed on a filtered sample.
9717446	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
9717447	Metals analysis completed on a filtered sample.
9717448	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
9717449-9717450	Metals analysis completed on a filtered sample.
9717451	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
9717452-9717454	Metals analysis completed on a filtered sample.
9717455	Metals analysis completed on a filtered sample. Ion Balance is biased high, contributing parameters have been confirmed.
9717459	Metals analysis completed on a filtered sample.
9717460	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
9717461	Metals analysis completed on a filtered sample.
9717462	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
9717463-9717467	Metals analysis completed on a filtered sample.
9717468	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
9717469-9717633	Metals analysis completed on a filtered sample.
9717634	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
9717636-9717638	Metals analysis completed on a filtered sample.

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

TP / Dissolved TP (Water)

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

SAMPLE DESCRIPTION:				FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A	FMS-HG18-05B
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19	2018-11-19
Parameter	Unit	G / S	RDL	9717442	9717446	9717447	9717448	9717449	9717450	9717451	9717452
Total Phosphorus	mg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Dissolved Phosphorus	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

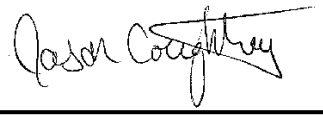
SAMPLE DESCRIPTION:				FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-010A
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-11-19	2018-11-20	2018-11-20	2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19
Parameter	Unit	G / S	RDL	9717453	9717454	9717455	9717459	9717460	9717461	9717462	9717463
Total Phosphorus	mg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Dissolved Phosphorus	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

SAMPLE DESCRIPTION:				FMS-HG18-010B	FMS-HG18-011A	FMS-HG18-011B	FMS-HG18-013A	FMS-HG18-013B	FMS-HG18-014A	FMS-HG18-014B	FMS-HG18-015A
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-20
Parameter	Unit	G / S	RDL	9717464	9717465	9717466	9717467	9717468	9717469	9717470	9717471
Total Phosphorus	mg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Dissolved Phosphorus	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

SAMPLE DESCRIPTION:				FMS-HG18-015B	FMS-HG18-016A	FMS-HG18-016B	DUP-1	DUP-2	DUP-3
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-11-20	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19
Parameter	Unit	G / S	RDL	9717631	9717633	9717634	9717636	9717637	9717638
Total Phosphorus	mg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Dissolved Phosphorus	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:



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CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Various Inorganics (Water)

DATE RECEIVED: 2018-11-20

DATE REPORTED: 2018-12-07

SAMPLE DESCRIPTION:				FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A	FMS-HG18-05B
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19	2018-11-19
Parameter	Unit	G / S	RDL	9717442	9717446	9717447	9717448	9717449	9717450	9717451	9717452
Chemical Oxygen Demand	mg/L		3	<3	<3	<3	<3	<3	<3	<3	<3
Dissolved Organic Carbon	mg/L		0.5	0.6	1.1	1.7	1.0	<0.5	<0.5	1.1	1.7
Total Suspended Solids	mg/L		5	20	54	20	654	6	56	52	122

SAMPLE DESCRIPTION:				FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-010A
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-11-19	2018-11-20	2018-11-20	2018-11-19	2018-11-19	2018-11-20	2018-11-20	2018-11-19
Parameter	Unit	G / S	RDL	9717453	9717454	9717455	9717459	9717460	9717461	9717462	9717463
Chemical Oxygen Demand	mg/L		3	<3	8	58	<3	5	<3	<3	<3
Dissolved Organic Carbon	mg/L		0.5	1.0	2.7	20.1	1.3	2.2	<0.5	1.2	<0.5
Total Suspended Solids	mg/L		5	<5	10	14	58	138	6	62	28

SAMPLE DESCRIPTION:				FMS-HG18-010B	FMS-HG18-011A	FMS-HG18-011B	FMS-HG18-013A	FMS-HG18-013B	FMS-HG18-014A	FMS-HG18-014B	FMS-HG18-015A
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-20
Parameter	Unit	G / S	RDL	9717464	9717465	9717466	9717467	9717468	9717469	9717470	9717471
Chemical Oxygen Demand	mg/L		3	<3	<3	12	<3	<3	<3	<3	<3
Dissolved Organic Carbon	mg/L		0.5	0.8	0.9	3.9	0.9	0.8	<0.5	0.8	<0.5
Total Suspended Solids	mg/L		5	110	6	8	10	72	34	6	<5

SAMPLE DESCRIPTION:				FMS-HG18-015B	FMS-HG18-016A	FMS-HG18-016B	DUP-1	DUP-2	DUP-3
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-11-20	2018-11-19	2018-11-19	2018-11-19	2018-11-19	2018-11-19
Parameter	Unit	G / S	RDL	9717631	9717633	9717634	9717636	9717637	9717638
Chemical Oxygen Demand	mg/L		3	<3	<3	<3	<3	<3	<3
Dissolved Organic Carbon	mg/L		0.5	<0.5	<0.5	1.0	<0.5	1.0	1.5
Total Suspended Solids	mg/L		5	32	28	100	40	16	120

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

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Guideline Violation

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
9717442	FMS-HG18-02A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	112
9717442	FMS-HG18-02A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	6.8
9717442	FMS-HG18-02A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	6
9717442	FMS-HG18-02A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	10
9717446	FMS-HG18-02B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	193
9717446	FMS-HG18-02B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	28.1
9717446	FMS-HG18-02B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.32
9717446	FMS-HG18-02B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	88
9717446	FMS-HG18-02B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.017
9717446	FMS-HG18-02B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	9
9717447	FMS-HG18-03A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	100 OG AO	295
9717447	FMS-HG18-03A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	23
9717447	FMS-HG18-03A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	201
9717447	FMS-HG18-03A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	9.8
9717447	FMS-HG18-03A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	295
9717447	FMS-HG18-03A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	23
9717448	FMS-HG18-03B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	100 OG AO	224
9717448	FMS-HG18-03B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	92
9717448	FMS-HG18-03B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	185
9717448	FMS-HG18-03B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	224
9717449	FMS-HG18-04A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	38
9717449	FMS-HG18-04A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	288
9717449	FMS-HG18-04A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	5.5
9717449	FMS-HG18-04A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	6
9717449	FMS-HG18-04A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	38
9717450	FMS-HG18-04B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300 AO	1750
9717450	FMS-HG18-04B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	1470
9717450	FMS-HG18-04B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Zinc	ug/L	5000 AO	5150
9717450	FMS-HG18-04B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	78.8
9717450	FMS-HG18-04B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.060
9717450	FMS-HG18-04B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300	1750
9717450	FMS-HG18-04B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	820	1470

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Guideline Violation

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
9717450	FMS-HG18-04B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Zinc	ug/L	30	5150
9717451	FMS-HG18-05A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	15
9717451	FMS-HG18-05A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	11.1
9717451	FMS-HG18-05A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.58
9717451	FMS-HG18-05A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	7
9717451	FMS-HG18-05A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	15
9717452	FMS-HG18-05B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	92
9717452	FMS-HG18-05B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	True Color	TCU	15 AO	23
9717452	FMS-HG18-05B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	51.8
9717452	FMS-HG18-05B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.67
9717452	FMS-HG18-05B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	10
9717452	FMS-HG18-05B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.030
9717452	FMS-HG18-05B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	4
9717453	FMS-HG18-06A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	306
9717453	FMS-HG18-06A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	5.2
9717453	FMS-HG18-06A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.34
9717453	FMS-HG18-06A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	14
9717453	FMS-HG18-06A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.094
9717454	FMS-HG18-07A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	16
9717454	FMS-HG18-07A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	613
9717454	FMS-HG18-07A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	5.2
9717454	FMS-HG18-07A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	16
9717455	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	100 OG AO	820
9717455	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	25
9717455	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300 AO	9160
9717455	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	402
9717455	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	True Color	TCU	15 AO	434
9717455	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	40.3
9717455	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.49
9717455	FMS-HG18-07B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	820
9717455	FMS-HG18-07B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	25
9717455	FMS-HG18-07B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300	9160
9717459	FMS-HG18-08A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	39.6

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CANADA B3B 1M2
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Guideline Violation

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
9717460	FMS-HG18-08B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	129
9717460	FMS-HG18-08B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	True Color	TCU	15 AO	17
9717460	FMS-HG18-08B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	48.2
9717460	FMS-HG18-08B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.27
9717460	FMS-HG18-08B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	58
9717460	FMS-HG18-08B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.029
9717461	FMS-HG18-09A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	442
9717461	FMS-HG18-09A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	5.0
9717462	FMS-HG18-09B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	283
9717462	FMS-HG18-09B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	41.7
9717462	FMS-HG18-09B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.78
9717462	FMS-HG18-09B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.038
9717462	FMS-HG18-09B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	21
9717463	FMS-HG18-010A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	95
9717463	FMS-HG18-010A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	16.5
9717463	FMS-HG18-010A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	10
9717464	FMS-HG18-010B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	21.4
9717464	FMS-HG18-010B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.61
9717464	FMS-HG18-010B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	55
9717465	FMS-HG18-011A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	2670
9717465	FMS-HG18-011A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	True Color	TCU	15 AO	18
9717465	FMS-HG18-011A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	3.2
9717465	FMS-HG18-011A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.69
9717465	FMS-HG18-011A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.087
9717465	FMS-HG18-011A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	820	2670
9717466	FMS-HG18-011B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	100 OG AO	334
9717466	FMS-HG18-011B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300 AO	3770
9717466	FMS-HG18-011B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	17200
9717466	FMS-HG18-011B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	17.8
9717466	FMS-HG18-011B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.11
9717466	FMS-HG18-011B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	334
9717466	FMS-HG18-011B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.197
9717466	FMS-HG18-011B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cobalt	ug/L	10	28

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Guideline Violation

AGAT WORK ORDER: 18X411370

PROJECT:

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
9717466	FMS-HG18-011B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	6
9717466	FMS-HG18-011B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300	3770
9717466	FMS-HG18-011B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	820	17200
9717467	FMS-HG18-013A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	3.7
9717467	FMS-HG18-013A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.71
9717467	FMS-HG18-013A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	10
9717468	FMS-HG18-013B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	30.4
9717468	FMS-HG18-013B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.49
9717468	FMS-HG18-013B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	77
9717468	FMS-HG18-013B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	3
9717468	FMS-HG18-013B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Silver	ug/L	0.1	0.6
9717469	FMS-HG18-014A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	14.2
9717469	FMS-HG18-014A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.029
9717470	FMS-HG18-014B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	100 OG AO	191
9717470	FMS-HG18-014B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	86
9717470	FMS-HG18-014B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	19.5
9717470	FMS-HG18-014B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.54
9717470	FMS-HG18-014B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	191
9717470	FMS-HG18-014B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.083
9717470	FMS-HG18-014B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	3
9717471	FMS-HG18-015A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	16
9717471	FMS-HG18-015A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	176
9717471	FMS-HG18-015A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	2.2
9717471	FMS-HG18-015A	NS-ContSiteSW_FW_FL	Mercury Analysis in Water (Dissolved)	Dissolved Mercury	ug/L	0.026	0.062
9717471	FMS-HG18-015A	NS-ContSiteSW_FW_FL	Mercury Analysis in Water (Total)	Total Mercury	ug/L	0.026	0.164
9717471	FMS-HG18-015A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	16
9717471	FMS-HG18-015A	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	16
9717631	FMS-HG18-015B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	358
9717631	FMS-HG18-015B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	20.8
9717633	FMS-HG18-016A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	177
9717633	FMS-HG18-016A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	17.9

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AGAT Laboratories

Guideline Violation

AGAT WORK ORDER: 18X411370

PROJECT:

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CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
9717634	FMS-HG18-016B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	100 OG AO	211
9717634	FMS-HG18-016B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	29.1
9717634	FMS-HG18-016B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.11
9717634	FMS-HG18-016B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	211
9717634	FMS-HG18-016B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.019
9717634	FMS-HG18-016B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	4
9717634	FMS-HG18-016B	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Silver	ug/L	0.1	1.7
9717636	DUP-1	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	14.5
9717636	DUP-1	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	6
9717636	DUP-1	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.023
9717637	DUP-2	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	100 OG AO	185
9717637	DUP-2	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	84
9717637	DUP-2	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	13.3
9717637	DUP-2	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.58
9717637	DUP-2	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	185
9717637	DUP-2	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.097
9717638	DUP-3	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	50 AO	96
9717638	DUP-3	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	45.6
9717638	DUP-3	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.73
9717638	DUP-3	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	11
9717638	DUP-3	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.037
9717638	DUP-3	NS-ContSiteSW_FW_FL	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	5

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES
AGAT WORK ORDER: 18X411370
PROJECT:
ATTENTION TO: Sheri Burton
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Dec 07, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
Benzene	1	9716618	< 0.001	< 0.001	NA	< 0.001	85%	70%	130%	119%	70%	130%			
Toluene	1	9716618	< 0.001	< 0.001	NA	< 0.001	98%	70%	130%	106%	70%	130%			
Ethylbenzene	1	9716618	< 0.001	< 0.001	NA	< 0.001	103%	70%	130%	116%	70%	130%			
Xylene (Total)	1	9716618	< 0.002	< 0.002	NA	< 0.002	105%	70%	130%	106%	70%	130%			
C6-C10 (less BTEX)	1	9716618	< 0.01	< 0.01	NA	< 0.01	103%	70%	130%	119%	70%	130%	119%	70%	130%
>C10-C16 Hydrocarbons	1	9715081	< 0.05	< 0.05	NA	< 0.05	98%	70%	130%	102%	70%	130%	NA	70%	130%
>C16-C21 Hydrocarbons	1	9715081	< 0.10	< 0.10	NA	< 0.10	95%	70%	130%	102%	70%	130%	NA	70%	130%
>C21-C32 Hydrocarbons	1	9715081	< 0.1	< 0.1	NA	< 0.1	92%	70%	130%	102%	70%	130%	NA	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
>C10-C16 Hydrocarbons	1	9717023	<0.05	<0.05	0	< 0.05	118%	70%	130%	84%	70%	130%	77%	70%	130%
>C16-C21 Hydrocarbons	1	9717023	<0.05	<0.05	0	< 0.10	115%	70%	130%	84%	70%	130%	77%	70%	130%
>C21-C32 Hydrocarbons	1	9717023	<0.01	<0.01	0	< 0.1	113%	70%	130%	84%	70%	130%	77%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
Benzene	1	9717459	< 0.001	< 0.001	NA	< 0.001	91%	70%	130%	119%	70%	130%			
Toluene	1	9717459	< 0.001	< 0.001	NA	< 0.001	91%	70%	130%	106%	70%	130%			
Ethylbenzene	1	9717459	< 0.001	< 0.001	NA	< 0.001	101%	70%	130%	116%	70%	130%			
Xylene (Total)	1	9717459	< 0.002	< 0.002	NA	< 0.002	103%	70%	130%	106%	70%	130%			
C6-C10 (less BTEX)	1	9717459	< 0.01	< 0.01	NA	< 0.01	85%	70%	130%	129%	70%	130%	124%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
>C10-C16 Hydrocarbons	1	9717460	< 0.05	< 0.05	NA	< 0.05	101%	70%	130%	113%	70%	130%	123%	70%	130%
>C16-C21 Hydrocarbons	1	9717460	< 0.10	< 0.10	NA	< 0.10	98%	70%	130%	113%	70%	130%	123%	70%	130%
>C21-C32 Hydrocarbons	1	9717460	< 0.1	< 0.1	NA	< 0.1	95%	70%	130%	113%	70%	130%	123%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Certified By:

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES
AGAT WORK ORDER: 18X411370
PROJECT:
ATTENTION TO: Sheri Burton
SAMPLING SITE:
SAMPLED BY:

Water Analysis

RPT Date: Dec 07, 2018

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Standard Water Analysis + Dissolved Metals															
pH	9717442	9717442	8.05	8.02	0.4%	<	102%	80%	120%	NA	80%	120%	NA	80%	120%
Reactive Silica as SiO2	1	9712152	18.3	18.6	1.6%	< 0.5	96%	80%	120%		80%	120%	100%	80%	120%
Chloride	9716380		89	89	0.0%	< 1	102%	80%	120%	NA	80%	120%	NA	80%	120%
Fluoride	9716380		<0.12	<0.12	NA	< 0.12	106%	80%	120%	NA	80%	120%	81%	80%	120%
Sulphate	9716380		11	11	0.4%	< 2	112%	80%	120%	NA	80%	120%	NA	80%	120%
Alkalinity	9717442	9717442	69	69	0.3%	< 5	92%	80%	120%	NA	80%	120%	NA	80%	120%
True Color	9715006		42	51	19.4%	< 5	105%	80%	120%	NA			NA		
Turbidity	9717455	9717455	40.3	39.6	1.8%	< 0.1	99%	80%	120%	NA			NA		
Electrical Conductivity	9717442	9717442	179	179	0.2%	< 1	102%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrate as N	9716380		0.42	0.39	6.6%	< 0.05	101%	80%	120%	NA	80%	120%	89%	80%	120%
Nitrite as N	9716380		0.06	0.07	NA	< 0.05	108%	80%	120%	NA	80%	120%	109%	80%	120%
Ammonia as N	1	9714213	0.03	0.03	NA	< 0.03	94%	80%	120%		80%	120%	96%	80%	120%
Total Organic Carbon	9717289		<0.5	<0.5	NA	< 0.5	87%	80%	120%	NA	80%	120%	83%	80%	120%
Ortho-Phosphate as P	1	9712152	<0.01	<0.01	NA	< 0.01	90%	80%	120%		80%	120%	98%	80%	120%
Dissolved Sodium	9717467	9717467	3.1	3.3	7.4%	< 0.1	101%	80%	120%	98%	80%	120%	NA	70%	130%
Dissolved Potassium	9717467	9717467	0.5	0.5	11.3%	< 0.1	100%	80%	120%	98%	80%	120%	114%	70%	130%
Dissolved Calcium	9717467	9717467	3.3	3.4	3.3%	< 0.1	102%	80%	120%	103%	80%	120%	NA	70%	130%
Dissolved Magnesium	9717467	9717467	0.5	0.5	9.5%	< 0.1	100%	80%	120%	96%	80%	120%	110%	70%	130%
Bicarb. Alkalinity (as CaCO3)	9717442	9717442	69	69	0.3%	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	9717442	9717442	<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	9717442	9717442	<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Dissolved Aluminum	9717467	9717467	10	10	NA	< 5	101%	80%	120%	101%	80%	120%	110%	70%	130%
Dissolved Antimony	9717467	9717467	<2	<2	NA	< 2	82%	80%	120%	101%	80%	120%	122%	70%	130%
Dissolved Arsenic	9717467	9717467	<2	<2	NA	< 2	92%	80%	120%	90%	80%	120%	116%	70%	130%
Dissolved Barium	9717467	9717467	<5	<5	NA	< 5	94%	80%	120%	93%	80%	120%	113%	70%	130%
Dissolved Beryllium	9717467	9717467	<2	<2	NA	< 2	104%	80%	120%	98%	80%	120%	121%	70%	130%
Dissolved Bismuth	9717467	9717467	<2	<2	NA	< 2	93%	80%	120%	95%	80%	120%	70%	70%	130%
Dissolved Boron	9717467	9717467	<5	<5	NA	< 5	101%	80%	120%	102%	80%	120%	122%	70%	130%
Dissolved Cadmium	9717467	9717467	<0.017	<0.017	NA	< 0.09	90%	80%	120%	92%	80%	120%	115%	70%	130%
Dissolved Chromium	9717467	9717467	<1	<1	NA	< 1	94%	80%	120%	96%	80%	120%	126%	70%	130%
Dissolved Cobalt	9717467	9717467	<1	<1	NA	< 1	91%	80%	120%	93%	80%	120%	116%	70%	130%
Dissolved Copper	9717467	9717467	<1	<1	NA	< 2	94%	80%	120%	94%	80%	120%	121%	70%	130%
Dissolved Iron	9717467	9717467	<50	<50	NA	< 50	92%	80%	120%	95%	80%	120%	105%	70%	130%
Dissolved Lead	9717467	9717467	<0.5	<0.5	NA	< 0.5	98%	80%	120%	96%	80%	120%	122%	70%	130%
Dissolved Manganese	9717467	9717467	8	8	NA	< 2	93%	80%	120%	93%	80%	120%	NA	70%	130%
Dissolved Molybdenum	9717467	9717467	<2	<2	NA	< 2	87%	80%	120%	90%	80%	120%	NA	70%	130%
Dissolved Nickel	9717467	9717467	<2	<2	NA	< 2	93%	80%	120%	94%	80%	120%	NA	70%	130%
Dissolved Phosphorus	9717467	9717467	<0.02	<0.02	NA	< 0.02	99%	80%	120%	99%	80%	120%	109%	70%	130%
Dissolved Selenium	9717467	9717467	<1	<1	NA	< 1	82%	80%	120%	85%	80%	120%	NA	70%	130%

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CANADA B3B 1M2
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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES
AGAT WORK ORDER: 18X411370
PROJECT:
ATTENTION TO: Sheri Burton
SAMPLING SITE:
SAMPLED BY:

Water Analysis (Continued)

RPT Date: Dec 07, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Dissolved Silver	9717467	9717467	<0.1	<0.1	NA	< 0.1	88%	80%	120%	89%	80%	120%	108%	70%	130%
Dissolved Strontium	9717467	9717467	26	28	7.5%	< 5	94%	80%	120%	95%	80%	120%	NA	70%	130%
Dissolved Thallium	9717467	9717467	<0.1	<0.1	NA	< 0.1	98%	80%	120%	95%	80%	120%	120%	70%	130%
Dissolved Tin	9717467	9717467	<2	<2	NA	< 2	89%	80%	120%	91%	80%	120%	NA	70%	130%
Dissolved Titanium	9717467	9717467	<2	<2	NA	< 2	98%	80%	120%	99%	80%	120%	NA	70%	130%
Dissolved Uranium	9717467	9717467	<0.1	<0.1	NA	< 0.1	98%	80%	120%	94%	80%	120%	119%	70%	130%
Dissolved Vanadium	9717467	9717467	<2	<2	NA	< 2	93%	80%	120%	92%	80%	120%	116%	70%	130%
Dissolved Zinc	9717467	9717467	<5	<5	NA	< 5	94%	80%	120%	94%	80%	120%	124%	70%	130%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Various Inorganics (Water)															
Chemical Oxygen Demand	9721388		426	365	15.4%	< 3	104%	80%	120%	NA			NA	80%	120%
Dissolved Organic Carbon	1		NA	NA	NA	< 0.5	87%	80%	120%	NA	80%	120%	NA	80%	120%
Total Suspended Solids	9708699		<5	<5	NA	< 5	103%	80%	120%	NA			100%	80%	120%
Standard Water Analysis + Dissolved Metals															
pH	9717468	9717468	6.49	6.23	4.1%	<	102%	80%	120%	NA	80%	120%	NA	80%	120%
Chloride	9717450	9717450	3	3	NA	< 1	97%	80%	120%	NA	80%	120%	97%	80%	120%
Fluoride	9717450	9717450	<0.12	<0.12	NA	< 0.12	107%	80%	120%	NA	80%	120%	109%	80%	120%
Sulphate	9717450	9717450	<2	<2	NA	< 2	115%	80%	120%	NA	80%	120%	97%	80%	120%
Alkalinity	9717468	9717468	5	<5	NA	< 5	93%	80%	120%	NA	80%	120%	NA	80%	120%
Electrical Conductivity	9717468	9717468	30	28	5.0%	< 1	104%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrate as N	9717450	9717450	<0.05	<0.05	NA	< 0.05	99%	80%	120%	NA	80%	120%	93%	80%	120%
Nitrite as N	9717450	9717450	<0.05	<0.05	NA	< 0.05	100%	80%	120%	NA	80%	120%	100%	80%	120%
Bicarb. Alkalinity (as CaCO3)	9717468	9717468	5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	9717468	9717468	<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	9717468	9717468	<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Standard Water Analysis + Dissolved Metals															
Chloride	9718051		123	124	1.0%	< 1	93%	80%	120%	NA	80%	120%	NA	80%	120%
Fluoride	9718051		<0.12	<0.12	NA	< 0.12	103%	80%	120%	NA	80%	120%	94%	80%	120%
Sulphate	9718051		<2	<2	NA	< 2	110%	80%	120%	NA	80%	120%	103%	80%	120%
Nitrate as N	9718051		0.78	0.76	1.9%	< 0.05	95%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrite as N	9718051		<0.05	<0.05	NA	< 0.05	97%	80%	120%	NA	80%	120%	117%	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Various Inorganics (Water)															
Chemical Oxygen Demand	9717459	9717459	<3	<3	NA	< 3	108%	80%	120%	NA			101%	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES
AGAT WORK ORDER: 18X411370
PROJECT:
ATTENTION TO: Sheri Burton
SAMPLING SITE:
SAMPLED BY:

Water Analysis (Continued)

RPT Date: Dec 07, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
TP / Dissolved TP (Water)															
Total Phosphorus	9714348		2.07	2.19	5.4%	< 0.02	98%	90%	110%	93%	90%	110%	98%	80%	120%
Total Dissolved Phosphorus	9717442		<0.05	<0.05	NA	< 0.05	104%	90%	110%	104%	90%	110%	100%	80%	120%
TP / Dissolved TP (Water)															
Total Phosphorus	9717460	9717460	<0.02	<0.02	NA	< 0.02	104%	90%	110%	108%	90%	110%	96%	80%	120%
Total Dissolved Phosphorus	9717468	9717468	<0.05	<0.05	NA	< 0.05	104%	90%	110%	104%	90%	110%	95%	80%	120%
Free & Total CN (Water)															
Cyanide, Free	9717631	9717631	<0.002	<0.002	NA	< 0.002	98%	90%	110%	97%	90%	110%	98%	70%	130%
Total Cyanide	9718252		<0.002	<0.002	NA	< 0.002	99%	80%	120%	103%	90%	110%	98%	70%	130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Certified By:

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 18X411370

PROJECT:

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SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Miscellaneous Analysis			
Subcontracted Data			
Trace Organics Analysis			
Benzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Toluene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Ethylbenzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Xylene (Total)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
C6-C10 (less BTEX)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
>C10-C16 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C16-C21 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C21-C32 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Modified TPH (Tier 1)	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	CALCULATION
Resemblance Comment	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
Return to Baseline at C32	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - VPH	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
n-Dotriacontane - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 18X411370

PROJECT:

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Cyanide, Free	INOR-93-6052	MOE CN-3015 & SM 4500 CN- I	TECHNICON AUTO ANALYZER
Total Cyanide	INOR-93-6051	MOE 3015 & SM 4500 CN- A,B,C	TECHNICON AUTO ANALYZER
Dissolved Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
Total Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
pH	INOR-121-6001	SM 4500 H+B	PC TITRATE
Reactive Silica as SiO2	INOR-121-6027	SM 4110 B	COLORIMETER
Chloride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Fluoride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Alkalinity	INOR-121-6001	SM 2320 B	
True Color	INOR-121-6014	SM 2120 C	NEPHELOMETER
Turbidity	INOR-121-6022	SM 2130 B	NEPHELOMETER
Electrical Conductivity	INOR-121-6001	SM 2510 B	PC TITRATE
Nitrate + Nitrite as N	INORG-121-6005	SM 4110 B	CALCULATION
Nitrate as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-121-6047	SM 4500-NH3 G	COLORIMETER
Total Organic Carbon	INORG-121-6026	SM 5310 B	TOC ANALYZER
Ortho-Phosphate as P	INOR-121-6012	SM 4110 B	COLORIMETER
Dissolved Sodium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Potassium	MET121-6104 & MET-121-6105	SM 3125	ICP-MS
Dissolved Calcium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Magnesium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Bicarb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Carb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Hydroxide	INORG-121-6001	SM 2320 B	PC-TITRATE
Calculated TDS	CALCULATION	SM 1030E	CALCULATION
Hardness	CALCULATION	SM 2340B	CALCULATION
Langelier Index (@20C)	CALCULATION	CALCULATION	CALCULATION
Langelier Index (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 20C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Anion Sum	CALCULATION	SM 1030E	CALCULATION
Cation sum	CALCULATION	SM 1030E	CALCULATION
% Difference/ Ion Balance	CALCULATION	SM 1030E	CALCULATION
Dissolved Aluminum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Antimony	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Arsenic	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Barium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Beryllium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 18X411370

PROJECT:

ATTENTION TO: Sheri Burton

SAMPLING SITE:

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Dissolved Bismuth	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Boron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cadmium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Chromium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cobalt	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Lead	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Molybdenum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Nickel	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Phosphorus	MET-121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Selenium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Silver	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Strontium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Thallium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Tin	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Titanium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Uranium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Vanadium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Phosphorus	INOR-93-6022	SM 4500-P B&E	SPECTROPHOTOMETER
Total Dissolved Phosphorus	INOR 1022	SM 4500-P B&E	SPECTROPHOTOMETER
Chemical Oxygen Demand	INORG-121-6013	SM 5220 B	SPECTROPHOTOMETER
Dissolved Organic Carbon	INORG-121-6026	SM 5310 B	TOC ANALYZER
Total Suspended Solids	INOR-121-6024, 6025	SM 2540C, D	GRAVIMETRIC

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SASKATCHEWAN RESEARCH COUNCIL

Environmental Analytical Laboratories
143-111 Research Drive, Saskatoon, SK Canada S7N 3R2

T: 306-933-6932 **F:** 306-933-7922
Toll-free: 1-800-240-8808
E: analytical@src.sk.ca

www.src.sk.ca/analytical

SRC Group # 2018-14720

Dec 06, 2018

AGAT Laboratories
122-11 Morris Drive
Dartmouth, NS B3B 1M2
Attn: Janetta Fraser

Date Samples Received: Nov-22-2018 Client P.O.: 120349

All results have been reviewed and approved by a Qualified Person in accordance with the Saskatchewan Environmental Code, Corrective Action Plan Chapter, for the purposes of certifying a laboratory analysis

Results from Lab Sections 1 and 2 have been authorized by Keith Gipman, Supervisor
Results from Lab Section 3 have been authorized by Pat Moser, Supervisor
Results from Lab Sections 4 and 5 have been authorized by Vicky Snook, Supervisor
Results from Lab Section 6 have been authorized by Marion McConnell, Supervisor

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* Test methods and data are validated by the laboratory's Quality Assurance Program.

* Routine methods follow recognized procedures from sources such as
    * Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF
    * Environment Canada
    * US EPA
    * CANMET

* The results reported relate only to the test samples as provided by the client.

* Samples will be kept for 30 days after the final report is sent. Please contact the lab if you have any special requirements.

* Additional information is available upon request.

This is a final report.

SASKATCHEWAN RESEARCH COUNCIL

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Dec 06, 2018

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Attn: Janetta Fraser

Date Samples Received: Nov-22-2018 Client P.O.: 120349

49154	**11/19/2018 18X411370 - 9717442 - FMS-HG18-02A *WATER***
49155	**11/19/2018 18X411370 - 9717446 - FMS-HG18-02B *WATER***
49156	**11/19/2018 18X411370 - 9717447 - FMS-HG18-03A *WATER***

Analyte	Units	49154	49155	49156
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.01	0.01	0.009

SASKATCHEWAN RESEARCH COUNCIL

Environmental Analytical Laboratories
143-111 Research Drive, Saskatoon, SK Canada S7N 3R2

T: 306-933-6932 **F:** 306-933-7922
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SRC Group # 2018-14720

Dec 06, 2018

AGAT Laboratories

49157	**11/19/2018 18X411370 - 9717448 - FMS-HG18-03B *WATER***
49158	**11/20/2018 18X411370 - 9717449 - FMS-HG18-04A *WATER***
49159	**11/20/2018 18X411370 - 9717450 - FMS-HG18-04B *WATER***

Analyte	Units	49157	49158	49159
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	0.01	0.006

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

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SRC Group # 2018-14720

Dec 06, 2018

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49160	**11/19/2018 18X411370 - 9717451 - FMS-HG18-05A *WATER***
49161	**11/19/2018 18X411370 - 9717452 - FMS-HG18-05B *WATER***
49162	**11/19/2018 18X411370 - 9717453 - FMS-HG18-06A *WATER***

Analyte	Units	49160	49161	49162
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.01	0.007	0.006

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SRC Group # 2018-14720

Dec 06, 2018

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49163	**11/20/2018 18X411370 - 9717454 - FMS-HG18-07A *WATER***
49164	**11/20/2018 18X411370 - 9717455 - FMS-HG18-07B *WATER***
49165	**11/19/2018 18X411370 - 9717459 - FMS-HG18-08A *WATER***

Analyte	Units	49163	49164	49165
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.01	<0.005	<0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

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SRC Group # 2018-14720

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49166	**11/19/2018 18X411370 - 9717460 - FMS-HG18-08B *WATER***
49167	**11/20/2018 18X411370 - 9717461 - FMS-HG18-09A *WATER***
49168	**11/20/2018 18X411370 - 9717462 - FMS-HG18-09B *WATER***

Analyte	Units	49166	49167	49168
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	0.03	0.01

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

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AGAT Laboratories

49169	**11/19/2018 18X411370 - 9717463 - FMS-HG18-010A *WATER***
49170	**11/19/2018 18X411370 - 9717464 - FMS-HG18-010B *WATER***
49171	**11/19/2018 18X411370 - 9717465 - FMS-HG18-011A *WATER***

Analyte	Units	49169	49170	49171
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.01	<0.005	0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

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Dec 06, 2018

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49172	**11/19/2018 18X411370 - 9717466 - FMS-HG18-011B *WATER***
49173	**11/19/2018 18X411370 - 9717467 - FMS-HG18-013A *WATER***
49174	**11/19/2018 18X411370 - 9717468 - FMS-HG18-013B *WATER***

Analyte	Units	49172	49173	49174
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	0.007	<0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

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SRC Group # 2018-14720

Dec 06, 2018

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49175	**11/19/2018 18X411370 - 9717469 - FMS-HG18-014A *WATER***
49176	**11/19/2018 18X411370 - 9717470 - FMS-HG18-014B *WATER***
49177	**11/20/2018 18X411370 - 9717471 - FMS-HG18-015A *WATER***

Analyte	Units	49175	49176	49177
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	<0.005	0.02

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

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SRC Group # 2018-14720

Dec 06, 2018

AGAT Laboratories

49178	**11/20/2018 18X411370 - 9717631 - FMS-HG18-015B *WATER***
49179	**11/19/2018 18X411370 - 9717633 - FMS-HG18-016A *WATER***
49180	**11/19/2018 18X411370 - 9717634 - FMS-HG18-016B *WATER***

Analyte	Units	49178	49179	49180
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.008	0.01	0.009

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AGAT Laboratories

49181	**11/19/2018 18X411370 - 9717636 - DUP-1 *WATER***
49182	**11/19/2018 18X411370 - 9717637 - DUP-2 *WATER***
49183	**11/19/2018 18X411370 - 9717638 - DUP-3 *WATER***

Analyte	Units	49181	49182	49183
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.006	0.009	0.005

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES
201 Brownlow Avenue, Suite 26
DARTMOUTH, NS B3B 1W2
(902) 466-1668

ATTENTION TO: Glen Merkley

PROJECT: 1895674

AGAT WORK ORDER: 19X449221

MISCELLANEOUS ANALYSIS REVIEWED BY: Kelly Hogue, B.Sc, P.Chem, Operations Manager

TRACE ORGANICS REVIEWED BY: Amy Hunter, Trace Organics Supervisor, B.Sc.

WATER ANALYSIS REVIEWED BY: Courtney O Brien, Data Reporter, B.Eng., EIT

DATE REPORTED: Apr 11, 2019

PAGES (INCLUDING COVER): 35

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Western Enviro-Agricultural Laboratory Association (WEALA)
Environmental Services Association of Alberta (ESAA)

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Results relate only to the items tested. Results apply to samples as received.
All reportable information as specified by ISO 17025:2017 is available from AGAT Laboratories upon request

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Subcontracted Data Received - Radium-226

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

		SAMPLE DESCRIPTION:		FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A	FMS-HG18-05B
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21
Parameter	Unit	G / S	RDL	9985275	9985282	9985283	9985284	9985285	9985286	9985287	9985288
Subcontracted Data				Y	Y	Y	Y	Y	Y	Y	Y

		SAMPLE DESCRIPTION:		FMS-HG18-06A	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-10A	FMS-HG18-10B	FMS-HG18-11A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-03-21	2019-03-21	2019-03-21	2019-03-22	2019-03-22	2019-03-22	2019-03-22	2019-03-21
Parameter	Unit	G / S	RDL	9985289	9985290	9985291	9985292	9985293	9985294	9985295	9985296
Subcontracted Data				Y	Y	Y	Y	Y	Y	Y	Y

		SAMPLE DESCRIPTION:		FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-03-21	2019-03-22	2019-03-22	2019-03-22	2019-03-22	2019-03-21	2019-03-21	2019-03-21
Parameter	Unit	G / S	RDL	9985297	9985298	9985299	9985300	9985301	9985339	9985357	9985361
Subcontracted Data				Y	Y	Y	Y	Y	Y	Y	Y

		SAMPLE DESCRIPTION:		DUP-A	DUP-B	DUP-C
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2019-03-21	2019-03-21	2019-03-22
Parameter	Unit	G / S	RDL	9985377	9985378	9985379
Subcontracted Data				Y	Y	Y

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: Kelly Hogue

Results relate only to the items tested. Results apply to samples as received.

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

					SAMPLE DESCRIPTION:	FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21
Parameter	Unit	G / S: A	G / S: B	RDL		9985275	9985282	9985283	9985284	9985285	9985286	9985287
Benzene	mg/L	0.005	2.1	0.001		<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001		0.002[<B]	0.002[<B]	0.002[<B]	0.002[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001		<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002		<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		1.5	0.1		<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Resemblance Comment						GR	GR	GR	GR	NR	NR	NR
Return to Baseline at C32						Y	Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits										
Isobutylbenzene - EPH	%	70-130				120	126	113	109	115	114	111
Isobutylbenzene - VPH	%	70-130				99	97	99	98	100	97	96
n-Dotriacontane - EPH	%	70-130				117	120	106	103	121	118	117

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

					SAMPLE DESCRIPTION:	FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-10A
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-22	2019-03-22	2019-03-22
Parameter	Unit	G / S: A	G / S: B	RDL		9985288	9985289	9985290	9985291	9985292	9985293	9985294
Benzene	mg/L	0.005	2.1	0.001		<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001		<0.001[<B]	<0.001[<B]	0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001		<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002		<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		1.5	0.1		<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Resemblance Comment						NR	NR	GR	NR	NR	NR	NR
Return to Baseline at C32						Y	Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits										
Isobutylbenzene - EPH	%	70-130				105	108	112	106	123	104	117
Isobutylbenzene - VPH	%	70-130				99	100	99	96	98	99	98
n-Dotriacontane - EPH	%	70-130				110	115	118	110	130	111	123

Certified By:

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TEL (902)468-8718
FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

					SAMPLE DESCRIPTION:	FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-14A	FMS-HG18-14B
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2019-03-22	2019-03-21	2019-03-21	2019-03-22	2019-03-22	2019-03-22	2019-03-22
Parameter	Unit	G / S: A	G / S: B	RDL		9985295	9985296	9985297	9985298	9985299	9985300	9985301
Benzene	mg/L	0.005	2.1	0.001		<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001		<0.001[<B]	0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001		<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002		<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		1.5	0.1		<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Resemblance Comment						NR	GR	NR	NR	NR	NR	NR
Return to Baseline at C32						Y	Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits										
Isobutylbenzene - EPH	%	70-130				106	107	108	107	108	115	103
Isobutylbenzene - VPH	%	70-130				95	98	95	95	102	103	101
n-Dotriacontane - EPH	%	70-130				110	112	118	114	115	119	107

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

					SAMPLE DESCRIPTION:	FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A	DUP-B	DUP-C
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-22
Parameter	Unit	G / S: A	G / S: B	RDL		9985339	9985357	9985361	9985377	9985378	9985379
Benzene	mg/L	0.005	2.1	0.001		<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001		<0.001[<B]	<0.001[<B]	<0.001[<B]	0.001[<B]	<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001		<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002		<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		1.5	0.1		<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Resemblance Comment						NR	NR	NR	GR	NR	NR
Return to Baseline at C32						Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits									
Isobutylbenzene - EPH	%	70-130				118	113	115	112	112	113
Isobutylbenzene - VPH	%	70-130				101	100	97	108	103	101
n-Dotriacontane - EPH	%	70-130				127	123	92	106	108	103

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Canadian Drinking Water Quality - updated 2019-03, B Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9985275-9985379 Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

COD, DOC, TP

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

SAMPLE DESCRIPTION:				FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A	FMS-HG18-05B
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21
Parameter	Unit	G / S	RDL	9985275	9985282	9985283	9985284	9985285	9985286	9985287	9985288
Chemical Oxygen Demand	mg/L		3	<3	<3	<3	<3	<3	<3	<3	<3
Dissolved Organic Carbon	mg/L		0.5	<0.5	0.7	0.6	<0.5	<0.5	<0.5	0.8	0.7
Total Phosphorous as P	mg/L		0.03	0.07	0.14	0.21	0.05	0.15	0.03	0.04	<0.03

SAMPLE DESCRIPTION:				FMS-HG18-06A	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-10A	FMS-HG18-10B	FMS-HG18-11A
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2019-03-21	2019-03-21	2019-03-21	2019-03-22	2019-03-22	2019-03-22	2019-03-22	2019-03-21
Parameter	Unit	G / S	RDL	9985289	9985290	9985291	9985292	9985293	9985294	9985295	9985296
Chemical Oxygen Demand	mg/L		3	<3	<3	4	<3	<3	<3	<3	4
Dissolved Organic Carbon	mg/L		0.5	1.0	<0.5	1.3	<0.5	<0.5	<0.5	<0.5	2.0
Total Phosphorous as P	mg/L		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.04

SAMPLE DESCRIPTION:				FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-16A	DUP-A	DUP-B
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2019-03-21	2019-03-22	2019-03-22	2019-03-22	2019-03-22	2019-03-21	2019-03-21	2019-03-21
Parameter	Unit	G / S	RDL	9985297	9985298	9985299	9985300	9985301	9985357	9985377	9985378
Chemical Oxygen Demand	mg/L		3	8	<3	3	<3	4	<3	<3	<3
Dissolved Organic Carbon	mg/L		0.5	2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8
Total Phosphorous as P	mg/L		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03

SAMPLE DESCRIPTION:				DUP-C
SAMPLE TYPE:				Water
DATE SAMPLED:				2019-03-22
Parameter	Unit	G / S	RDL	9985379
Chemical Oxygen Demand	mg/L		3	<3
Dissolved Organic Carbon	mg/L		0.5	0.5
Total Phosphorous as P	mg/L		0.03	<0.03

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

COD, DOC, TP, Total Cyanide

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

				SAMPLE DESCRIPTION:	FMS-HG18-15B	FMS-HG18-16B
				SAMPLE TYPE:	Water	Water
				DATE SAMPLED:	2019-03-21	2019-03-21
Parameter	Unit	G / S	RDL		9985339	9985361
Chemical Oxygen Demand	mg/L		3		<3	<3
Dissolved Organic Carbon	mg/L		0.5		<0.5	1.1
Total Phosphorous as P	mg/L		0.03		<0.03	<0.03
Total Cyanide	mg/L	0.2	0.005		0.038	<0.005

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Canadian Drinking Water Quality - updated 2019-03
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Analysis performed at AGAT Halifax (unless marked by *)

Certified By: CoBrien

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CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Dissolved TP (Water)

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

SAMPLE DESCRIPTION:				FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A	FMS-HG18-05B
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21
Parameter	Unit	G / S	RDL	9985275	9985282	9985283	9985284	9985285	9985286	9985287	9985288
Total Phosphorus, Dissolved	mg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

SAMPLE DESCRIPTION:				FMS-HG18-06A	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-10A	FMS-HG18-10B	FMS-HG18-11A
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2019-03-21	2019-03-21	2019-03-21	2019-03-22	2019-03-22	2019-03-22	2019-03-22	2019-03-21
Parameter	Unit	G / S	RDL	9985289	9985290	9985291	9985292	9985293	9985294	9985295	9985296
Total Phosphorus, Dissolved	mg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

SAMPLE DESCRIPTION:				FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2019-03-21	2019-03-22	2019-03-22	2019-03-22	2019-03-22	2019-03-21	2019-03-21	2019-03-21
Parameter	Unit	G / S	RDL	9985297	9985298	9985299	9985300	9985301	9985339	9985357	9985361
Total Phosphorus, Dissolved	mg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

SAMPLE DESCRIPTION:				DUP-A	DUP-B	DUP-C
SAMPLE TYPE:				Water	Water	Water
DATE SAMPLED:				2019-03-21	2019-03-21	2019-03-22
Parameter	Unit	G / S	RDL	9985377	9985378	9985379
Total Phosphorus, Dissolved	mg/L		0.02	<0.02	<0.02	<0.02

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Mercury Analysis in Water (Dissolved)

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

				SAMPLE DESCRIPTION:	FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21
Parameter	Unit	G / S: A	G / S: B	RDL	9985275	9985282	9985283	9985284	9985285	9985286	9985287
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

				SAMPLE DESCRIPTION:	FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-10A
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-22	2019-03-22	2019-03-22
Parameter	Unit	G / S: A	G / S: B	RDL	9985288	9985289	9985290	9985291	9985292	9985293	9985294
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

				SAMPLE DESCRIPTION:	FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-14A	FMS-HG18-14B
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2019-03-22	2019-03-21	2019-03-21	2019-03-22	2019-03-22	2019-03-22	2019-03-22
Parameter	Unit	G / S: A	G / S: B	RDL	9985295	9985296	9985297	9985298	9985299	9985300	9985301
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	0.017[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

				SAMPLE DESCRIPTION:	FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A	DUP-B	DUP-C
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-22
Parameter	Unit	G / S: A	G / S: B	RDL	9985339	9985357	9985361	9985377	9985378	9985379
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Canadian Drinking Water Quality - updated 2019-03, B Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016
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Analysis performed at AGAT Halifax (unless marked by *)

Certified By: CoBrien

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Mercury Analysis in Water (Total)

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

SAMPLE DESCRIPTION:					FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21
Parameter	Unit	G / S: A	G / S: B	RDL	9985275	9985282	9985283	9985284	9985285	9985286	9985287
Total Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

SAMPLE DESCRIPTION:					FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-10A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-22	2019-03-22	2019-03-22
Parameter	Unit	G / S: A	G / S: B	RDL	9985288	9985289	9985290	9985291	9985292	9985293	9985294
Total Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

SAMPLE DESCRIPTION:					FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-14A	FMS-HG18-14B
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-03-22	2019-03-21	2019-03-21	2019-03-22	2019-03-22	2019-03-22	2019-03-22
Parameter	Unit	G / S: A	G / S: B	RDL	9985295	9985296	9985297	9985298	9985299	9985300	9985301
Total Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	0.018[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

SAMPLE DESCRIPTION:					FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A	DUP-B	DUP-C
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-22
Parameter	Unit	G / S: A	G / S: B	RDL	9985339	9985357	9985361	9985377	9985378	9985379
Total Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Canadian Drinking Water Quality - updated 2019-03, B Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016
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Analysis performed at AGAT Halifax (unless marked by *)

Certified By: CoBrien

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Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals (FWAL)

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

SAMPLE DESCRIPTION:					FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21
Parameter	Unit	G / S: A	G / S: B	RDL	9985275	9985282	9985283	9985284	9985285	9985286	9985287
pH		7.0-10.5 OG			7.95	6.02	7.53	6.87	8.12	6.76	6.43
Reactive Silica as SiO2	mg/L			0.5	9.5	3.2	12.8	7.2	10.9	8.0	9.0
Chloride	mg/L	250 AO		1	4	3	4	3	3	3	4
Fluoride	mg/L	1.5		0.12	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	0.24[<A]	<0.12[<A]	<0.12[<A]
Sulphate	mg/L	500 AO		2	15	2	17	<2	7	3	3
Alkalinity	mg/L			5	76	<5	38	9	154	24	11
True Color	TCU	15 AO		5	<5	<5	<5	<5	<5	<5	5
Turbidity	NTU	0.1-1		0.1	3.6	1.6	6.1	1.5	2.4	36.5	4.8
Electrical Conductivity	umho/cm			1	181	25	132	36	288	65	55
Nitrate + Nitrite as N	mg/L			0.05	0.07	<0.05	0.11	0.07	<0.05	<0.05	0.32
Nitrate as N	mg/L	10		0.05	0.07[<A]	<0.05[<A]	0.11[<A]	0.07[<A]	<0.05[<A]	<0.05[<A]	0.32[<A]
Nitrite as N	mg/L	1.0		0.05	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Ammonia as N	mg/L			0.03	0.07	0.04	<0.03	<0.03	0.05	0.03	<0.03
Total Organic Carbon	mg/L			0.5	<0.5	0.6	1.0	<0.5	<0.5	<0.5	<0.5
Ortho-Phosphate as P	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L	200 AO		0.1	7.2	2.6	9.1	2.8	34.1	6.4	2.9
Dissolved Potassium	mg/L			0.1	1.7	0.3	1.2	0.7	1.7	0.7	2.3
Dissolved Calcium	mg/L			0.1	22.5	0.7	11.0	2.4	17.8	2.9	3.5
Dissolved Magnesium	mg/L			0.1	2.3	0.3	0.8	0.5	3.1	0.7	0.7
Bicarb. Alkalinity (as CaCO3)	mg/L			5	76	<5	38	9	154	24	11
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L			5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L	500 AO		1	99	9	67	15	159	34	24
Hardness	mg/L				65.7	3.0	30.8	8.1	57.2	10.1	11.6
Langelier Index (@20C)	NA				-0.40	-4.93	-1.42	-3.30	-0.05	-2.94	-3.51
Langelier Index (@ 4C)	NA				-0.72	-5.25	-1.74	-3.62	-0.37	-3.26	-3.83
Saturation pH (@ 20C)	NA				8.35	11.0	8.95	10.2	8.17	9.70	9.94
Saturation pH (@ 4C)	NA				8.67	11.3	9.27	10.5	8.49	10.0	10.3
Anion Sum	me/L				1.95	0.13	1.23	0.27	3.31	0.63	0.42
Cation sum	me/L				1.68	0.20	1.05	0.31	2.68	0.61	0.42

Certified By: CoBrien

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AGAT Laboratories
11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals (FWAL)

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

SAMPLE DESCRIPTION:					FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21
Parameter	Unit	G / S: A	G / S: B	RDL	9985275	9985282	9985283	9985284	9985285	9985286	9985287
% Difference/ Ion Balance	%				7.5	21.5	8.2	6.4	10.4	1.8	0.1
Dissolved Aluminum	ug/L	100 OG AO	5	5	<5[<B]	89[>B]	<5[<B]	<5[<B]	<5[<B]	<5[<B]	5[B]
Dissolved Antimony	ug/L	6	20	2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Arsenic	ug/L	10	5.0	2	11[>A]	<2[<B]	16[>A]	<2[<B]	31[>A]	<2[<B]	13[>A]
Dissolved Barium	ug/L	1000	1000	5	9[<A]	9[<A]	8[<A]	7[<A]	7[<A]	18[<A]	10[<A]
Dissolved Beryllium	ug/L		5.3	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Bismuth	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	5000	1200	5	12[<B]	<5[<B]	6[<B]	<5[<B]	13[<B]	<5[<B]	<5[<B]
Dissolved Cadmium	ug/L	5	0.01	0.017	<0.017[<A]	0.018[B-A]	<0.017[<A]	0.019[B-A]	<0.017[<A]	0.020[B-A]	<0.017[<A]
Dissolved Chromium	ug/L	50	-	1	1[<A]	<1[<A]	<1[<A]	<1[<A]	2[<A]	1[<A]	1[<A]
Dissolved Cobalt	ug/L		10	1	<1[<B]	<1[<B]	<1[<B]	3[<B]	<1[<B]	7[<B]	<1[<B]
Dissolved Copper	ug/L	1000 AO	2	1	14[>B]	3[>B]	<1[<B]	3[>B]	<1[<B]	<1[<B]	2[B]
Dissolved Iron	ug/L	300 AO	300	50	<50[<B]	<50[<B]	<50[<B]	<50[<B]	<50[<B]	574[>B]	<50[<B]
Dissolved Lead	ug/L	5	1	0.5	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]
Dissolved Manganese	ug/L	50 AO	820	2	70[<B]	31[<B]	144[<B]	143[<B]	293[<B]	897[>B]	9[<B]
Dissolved Molybdenum	ug/L		73	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	7[<B]	<2[<B]	<2[<B]
Dissolved Nickel	ug/L		25	2	<2[<B]	<2[<B]	<2[<B]	16[<B]	<2[<B]	5[<B]	<2[<B]
Dissolved Phosphorus	mg/L			0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	50	1.0	1	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Silver	ug/L		0.1	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	0.2[>B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Strontium	ug/L		21000	5	196[<B]	9[<B]	63[<B]	14[<B]	114[<B]	14[<B]	23[<B]
Dissolved Thallium	ug/L		0.8	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Tin	ug/L		-	2	<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Uranium	ug/L	20	300	0.1	2.7[<A]	<0.1[<A]	0.8[<A]	<0.1[<A]	7.4[<A]	0.1[<A]	<0.1[<A]
Dissolved Vanadium	ug/L		6	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Zinc	ug/L	5000 AO	30	5	6[<B]	<5[<B]	<5[<B]	22[<B]	<5[<B]	1680[>B]	13[<B]

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CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals (FWAL)

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

SAMPLE DESCRIPTION:					FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-10A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-22	2019-03-22	2019-03-22
Parameter	Unit	G / S: A	G / S: B	RDL	9985288	9985289	9985290	9985291	9985292	9985293	9985294
pH		7.0-10.5 OG			6.69	6.88	7.49	6.63	7.58	6.50	7.99
Reactive Silica as SiO2	mg/L			0.5	7.7	8.5	8.9	1.5	19.5	10.7	13.3
Chloride	mg/L	250 AO		1	2	9	2	<1	3	3	3
Fluoride	mg/L	1.5		0.12	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]
Sulphate	mg/L	500 AO		2	3	14	3	<2	3	<2	10
Alkalinity	mg/L			5	17	29	42	5	81	23	79
True Color	TCU	15 AO		5	<5	<5	<5	6	<5	<5	<5
Turbidity	NTU	0.1-1		0.1	99.6	35.7	18.6	32.7	3.0	35.9	8.5
Electrical Conductivity	umho/cm			1	76	141	95	15	171	64	182
Nitrate + Nitrite as N	mg/L			0.05	1.90	0.07	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as N	mg/L	10		0.05	1.90[<A]	0.07[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Nitrite as N	mg/L	1.0		0.05	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Ammonia as N	mg/L			0.03	0.06	0.06	<0.03	<0.03	0.05	<0.03	<0.03
Total Organic Carbon	mg/L			0.5	0.9	1.2	<0.5	1.6	<0.5	<0.5	<0.5
Ortho-Phosphate as P	mg/L			0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L	200 AO		0.1	7.4	7.5	3.9	1.5	5.2	5.0	6.7
Dissolved Potassium	mg/L			0.1	2.8	1.3	0.5	0.1	1.1	0.8	1.0
Dissolved Calcium	mg/L			0.1	3.4	13.2	9.9	0.7	23.1	4.6	22.1
Dissolved Magnesium	mg/L			0.1	0.6	0.9	0.6	0.2	0.8	0.7	1.5
Bicarb. Alkalinity (as CaCO3)	mg/L			5	17	29	42	5	81	23	79
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L			5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L	500 AO		1	39	66	45	6	85	29	92
Hardness	mg/L				11.0	36.7	27.2	2.6	61.0	14.4	61.4
Langelier Index (@20C)	NA				-3.09	-2.11	-1.44	-4.29	-0.73	-3.01	-0.35
Langelier Index (@ 4C)	NA				-3.41	-2.43	-1.76	-4.61	-1.05	-3.33	-0.67
Saturation pH (@ 20C)	NA				9.78	8.99	8.93	10.9	8.31	9.51	8.34
Saturation pH (@ 4C)	NA				10.1	9.31	9.25	11.2	8.63	9.83	8.66
Anion Sum	me/L				0.59	1.13	0.96	0.10	1.77	0.54	1.87
Cation sum	me/L				0.68	1.20	0.73	0.13	1.49	0.57	1.55

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CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals (FWAL)

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

SAMPLE DESCRIPTION:					FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-10A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-22	2019-03-22	2019-03-22
Parameter	Unit	G / S: A	G / S: B	RDL	9985288	9985289	9985290	9985291	9985292	9985293	9985294
% Difference/ Ion Balance	%				6.7	2.8	13.7	13.0	8.4	2.1	9.4
Dissolved Aluminum	ug/L	100 OG AO	5	5	480[>B]	8[>B]	<5[<B]	87[>B]	<5[<B]	<5[<B]	9[>B]
Dissolved Antimony	ug/L	6	20	2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Arsenic	ug/L	10	5.0	2	5[B]	47[>A]	2[<B]	<2[<B]	<2[<B]	<2[<B]	2[<B]
Dissolved Barium	ug/L	1000	1000	5	11[<A]	20[<A]	<5[<A]	<5[<A]	14[<A]	10[<A]	6[<A]
Dissolved Beryllium	ug/L		5.3	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Bismuth	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	5000	1200	5	6[<B]	8[<B]	<5[<B]	<5[<B]	5[<B]	<5[<B]	16[<B]
Dissolved Cadmium	ug/L	5	0.01	0.017	0.033[B-A]	<0.017[<A]	<0.017[<A]	<0.017[<A]	<0.017[<A]	0.032[B-A]	<0.017[<A]
Dissolved Chromium	ug/L	50	-	1	1[<A]	1[<A]	<1[<A]	<1[<A]	1[<A]	2[<A]	1[<A]
Dissolved Cobalt	ug/L		10	1	4[<B]	3[<B]	<1[<B]	<1[<B]	<1[<B]	2[<B]	<1[<B]
Dissolved Copper	ug/L	1000 AO	2	1	23[>B]	<1[<B]	<1[<B]	2[B]	1[<B]	12[>B]	1[<B]
Dissolved Iron	ug/L	300 AO	300	50	142[<B]	1990[>B]	<50[<B]	<50[<B]	<50[<B]	738[>B]	<50[<B]
Dissolved Lead	ug/L	5	1	0.5	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]
Dissolved Manganese	ug/L	50 AO	820	2	90[<B]	713[<B]	14[<B]	23[<B]	423[<B]	438[<B]	123[<B]
Dissolved Molybdenum	ug/L		73	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Nickel	ug/L		25	2	14[<B]	3[<B]	<2[<B]	<2[<B]	<2[<B]	6[<B]	<2[<B]
Dissolved Phosphorus	mg/L			0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	50	1.0	1	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Silver	ug/L		0.1	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	0.1[B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Strontium	ug/L		21000	5	20[<B]	38[<B]	43[<B]	5[<B]	94[<B]	39[<B]	110[<B]
Dissolved Thallium	ug/L		0.8	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Tin	ug/L		-	2	<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L			2	3	<2	<2	<2	<2	<2	<2
Dissolved Uranium	ug/L	20	300	0.1	<0.1[<A]	<0.1[<A]	0.2[<A]	<0.1[<A]	0.6[<A]	<0.1[<A]	0.5[<A]
Dissolved Vanadium	ug/L		6	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Zinc	ug/L	5000 AO	30	5	17[<B]	6[<B]	<5[<B]	<5[<B]	<5[<B]	8[<B]	<5[<B]

Certified By: CoBrien

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals (FWAL)

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

SAMPLE DESCRIPTION:					FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-14A	FMS-HG18-14B
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-03-22	2019-03-21	2019-03-21	2019-03-22	2019-03-22	2019-03-22	2019-03-22
Parameter	Unit	G / S: A	G / S: B	RDL	9985295	9985296	9985297	9985298	9985299	9985300	9985301
pH		7.0-10.5 OG			7.46	6.88	6.42	6.73	6.02	7.40	6.36
Reactive Silica as SiO2	mg/L			0.5	6.4	9.2	4.1	7.8	4.3	8.3	5.0
Chloride	mg/L	250 AO		1	5	3	5	3	3	7	6
Fluoride	mg/L	1.5		0.12	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]
Sulphate	mg/L	500 AO		2	4	4	9	2	<2	7	3
Alkalinity	mg/L			5	41	45	38	12	<5	71	6
True Color	TCU	15 AO		5	<5	<5	8	<5	<5	<5	<5
Turbidity	NTU	0.1-1		0.1	16.9	1.5	19.5	2.3	2.9	12.3	0.8
Electrical Conductivity	umho/cm			1	103	111	126	44	28	183	52
Nitrate + Nitrite as N	mg/L			0.05	0.23	0.18	0.47	0.09	0.07	0.12	0.05
Nitrate as N	mg/L	10		0.05	0.23[<A]	0.18[<A]	0.47[<A]	0.09[<A]	0.07[<A]	0.12[<A]	0.05[<A]
Nitrite as N	mg/L	1.0		0.05	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Ammonia as N	mg/L			0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Total Organic Carbon	mg/L			0.5	<0.5	<0.5	2.3	<0.5	<0.5	<0.5	<0.5
Ortho-Phosphate as P	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L	200 AO		0.1	2.7	4.6	3.2	3.5	1.9	10.0	3.9
Dissolved Potassium	mg/L			0.1	0.1	0.7	0.1	0.3	<0.1	1.0	0.6
Dissolved Calcium	mg/L			0.1	6.1	10.8	3.2	2.9	1.0	20.5	2.8
Dissolved Magnesium	mg/L			0.1	0.4	0.9	1.4	0.4	0.3	1.1	0.6
Bicarb. Alkalinity (as CaCO3)	mg/L			5	41	45	38	12	<5	71	6
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L			5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L	500 AO		1	44	54	71	20	7	90	21
Hardness	mg/L				16.9	30.7	13.8	8.9	3.7	55.7	9.5
Langelier Index (@20C)	NA				-1.69	-1.99	-3.07	-3.25	-4.78	-1.02	-3.93
Langelier Index (@ 4C)	NA				-2.01	-2.31	-3.39	-3.57	-5.10	-1.34	-4.25
Saturation pH (@ 20C)	NA				9.15	8.87	9.49	9.98	10.8	8.42	10.3
Saturation pH (@ 4C)	NA				9.47	9.19	9.81	10.3	11.1	8.74	10.6
Anion Sum	me/L				1.06	1.08	1.12	0.37	0.09	1.77	0.36
Cation sum	me/L				0.47	0.93	1.32	0.34	0.18	1.58	0.39

Certified By: CoBrien

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CANADA B3B 1M2
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FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals (FWAL)

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

SAMPLE DESCRIPTION:					FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-14A	FMS-HG18-14B
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-03-22	2019-03-21	2019-03-21	2019-03-22	2019-03-22	2019-03-22	2019-03-22
Parameter	Unit	G / S: A	G / S: B	RDL	9985295	9985296	9985297	9985298	9985299	9985300	9985301
% Difference/ Ion Balance	%				39.0	7.8	8.2	3.9	32.3	5.8	4.5
Dissolved Aluminum	ug/L	100 OG AO	5	5	66[>B]	<5[<B]	208[>B]	53[>B]	103[>B]	<5[<B]	113[>B]
Dissolved Antimony	ug/L	6	20	2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Arsenic	ug/L	10	5.0	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	4[<B]	<2[<B]
Dissolved Barium	ug/L	1000	1000	5	<5[<A]	<5[<A]	10[<A]	<5[<A]	6[<A]	14[<A]	14[<A]
Dissolved Beryllium	ug/L		5.3	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Bismuth	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	5000	1200	5	<5[<B]	<5[<B]	<5[<B]	<5[<B]	<5[<B]	<5[<B]	<5[<B]
Dissolved Cadmium	ug/L	5	0.01	0.017	0.020[B-A]	0.077[B-A]	<0.017[<A]	<0.017[<A]	0.020[B-A]	0.027[B-A]	0.045[B-A]
Dissolved Chromium	ug/L	50	-	1	1[<A]	2[<A]	4[<A]	1[<A]	<1[<A]	2[<A]	<1[<A]
Dissolved Cobalt	ug/L		10	1	<1[<B]	<1[<B]	25[>B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Copper	ug/L	1000 AO	2	1	<1[<B]	<1[<B]	4[>B]	<1[<B]	3[>B]	<1[<B]	1[<B]
Dissolved Iron	ug/L	300 AO	300	50	<50[<B]	<50[<B]	1050[>B]	<50[<B]	<50[<B]	<50[<B]	<50[<B]
Dissolved Lead	ug/L	5	1	0.5	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]
Dissolved Manganese	ug/L	50 AO	820	2	15[<B]	2570[>B]	23200[>B]	19[<B]	148[<B]	33[<B]	37[<B]
Dissolved Molybdenum	ug/L		73	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Nickel	ug/L		25	2	<2[<B]	<2[<B]	5[<B]	<2[<B]	7[<B]	<2[<B]	3[<B]
Dissolved Phosphorus	mg/L			0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	50	1.0	1	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Silver	ug/L		0.1	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	0.3[>B]	<0.1[<B]	<0.1[<B]
Dissolved Strontium	ug/L		21000	5	15[<B]	59[<B]	19[<B]	27[<B]	12[<B]	74[<B]	16[<B]
Dissolved Thallium	ug/L		0.8	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Tin	ug/L		-	2	<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Uranium	ug/L	20	300	0.1	<0.1[<A]	0.3[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	0.3[<A]	0.2[<A]
Dissolved Vanadium	ug/L		6	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Zinc	ug/L	5000 AO	30	5	<5[<B]	<5[<B]	<5[<B]	<5[<B]	<5[<B]	<5[<B]	<5[<B]

Certified By: CoBrien

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AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals (FWAL)

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

SAMPLE DESCRIPTION:					FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A	DUP-B	DUP-C
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-22
Parameter	Unit	G / S: A	G / S: B	RDL	9985339	9985357	9985361	9985377	9985378	9985379
pH		7.0-10.5 OG			7.69	7.92	5.98	7.95	7.07	6.86
Reactive Silica as SiO2	mg/L			0.5	9.4	17.3	4.0	9.1	8.9	9.6
Chloride	mg/L	250 AO		1	3	3	3	3	2	3
Fluoride	mg/L	1.5		0.12	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]	<0.12[<A]
Sulphate	mg/L	500 AO		2	7	9	2	12	3	2
Alkalinity	mg/L			5	61	61	<5	75	18	12
True Color	TCU	15 AO		5	<5	<5	<5	5	<5	<5
Turbidity	NTU	0.1-1		0.1	103	5.0	11.9	3.9	78.7	2.5
Electrical Conductivity	umho/cm			1	145	150	28	187	77	44
Nitrate + Nitrite as N	mg/L			0.05	<0.05	<0.05	<0.05	<0.05	1.74	0.15
Nitrate as N	mg/L	10		0.05	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	1.74[<A]	0.15[<A]
Nitrite as N	mg/L	1.0		0.05	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Ammonia as N	mg/L			0.03	<0.03	<0.03	<0.03	<0.03	0.06	<0.03
Total Organic Carbon	mg/L			0.5	<0.5	<0.5	1.1	<0.5	1.0	0.6
Ortho-Phosphate as P	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L	200 AO		0.1	4.0	5.5	2.4	6.5	6.6	3.3
Dissolved Potassium	mg/L			0.1	0.7	1.5	0.4	2.0	3.2	0.5
Dissolved Calcium	mg/L			0.1	19.9	20.9	0.9	27.7	3.9	3.5
Dissolved Magnesium	mg/L			0.1	1.0	1.9	0.4	2.4	0.7	0.5
Bicarb. Alkalinity (as CaCO3)	mg/L			5	61	61	<5	75	18	12
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L			5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L	500 AO		1	73	79	9	99	39	21
Hardness	mg/L				53.8	60.0	3.9	79.1	12.6	10.8
Langelier Index (@20C)	NA				-0.80	-0.55	-4.86	-0.32	-2.63	-3.04
Langelier Index (@ 4C)	NA				-1.12	-0.87	-5.18	-0.64	-2.95	-3.36
Saturation pH (@ 20C)	NA				8.49	8.47	10.8	8.27	9.70	9.90
Saturation pH (@ 4C)	NA				8.81	8.79	11.2	8.59	10.0	10.2
Anion Sum	me/L				1.45	1.49	0.13	1.83	0.60	0.38
Cation sum	me/L				1.29	1.49	0.21	1.92	0.68	0.38

Certified By: CoBrien

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Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals (FWAL)

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

					SAMPLE DESCRIPTION:	FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A	DUP-B	DUP-C
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-22
Parameter	Unit	G / S: A	G / S: B	RDL		9985339	9985357	9985361	9985377	9985378	9985379
% Difference/ Ion Balance	%					5.8	0.2	26.0	2.3	5.9	0.5
Dissolved Aluminum	ug/L	100 OG AO	5	5		10[>B]	<5[<B]	178[>B]	5[B]	398[>B]	72[>B]
Dissolved Antimony	ug/L	6	20	2		<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Arsenic	ug/L	10	5.0	2		3[<B]	<2[<B]	<2[<B]	11[>A]	5[B]	<2[<B]
Dissolved Barium	ug/L	1000	1000	5		7[<A]	<5[<A]	10[<A]	10[<A]	10[<A]	<5[<A]
Dissolved Beryllium	ug/L		5.3	2		<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Bismuth	ug/L			2		<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	5000	1200	5		<5[<B]	8[<B]	<5[<B]	13[<B]	6[<B]	<5[<B]
Dissolved Cadmium	ug/L	5	0.01	0.017		<0.017[<A]	<0.017[<A]	<0.017[<A]	<0.017[<A]	0.038[B-A]	<0.017[<A]
Dissolved Chromium	ug/L	50	-	1		<1[<A]	<1[<A]	<1[<A]	<1[<A]	<1[<A]	<1[<A]
Dissolved Cobalt	ug/L		10	1		<1[<B]	<1[<B]	<1[<B]	<1[<B]	3[<B]	<1[<B]
Dissolved Copper	ug/L	1000 AO	2	1		<1[<B]	<1[<B]	13[>B]	14[>B]	22[>B]	<1[<B]
Dissolved Iron	ug/L	300 AO	300	50		193[<B]	<50[<B]	<50[<B]	<50[<B]	120[<B]	<50[<B]
Dissolved Lead	ug/L	5	1	0.5		<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]
Dissolved Manganese	ug/L	50 AO	820	2		409[<B]	187[<B]	29[<B]	70[<B]	83[<B]	7[<B]
Dissolved Molybdenum	ug/L		73	2		<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Nickel	ug/L		25	2		<2[<B]	<2[<B]	3[<B]	<2[<B]	13[<B]	<2[<B]
Dissolved Phosphorus	mg/L			0.02		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	50	1.0	1		<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Silver	ug/L		0.1	0.1		<0.1[<B]	0.4[>B]	0.5[>B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Strontium	ug/L		21000	5		38[<B]	85[<B]	11[<B]	192[<B]	20[<B]	28[<B]
Dissolved Thallium	ug/L		0.8	0.1		<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Tin	ug/L		-	2		<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L			2		<2	<2	<2	<2	3	<2
Dissolved Uranium	ug/L	20	300	0.1		0.2[<A]	0.3[<A]	<0.1[<A]	2.9[<A]	0.1[<A]	<0.1[<A]
Dissolved Vanadium	ug/L		6	2		<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Zinc	ug/L	5000 AO	30	5		<5[<B]	<5[<B]	10[<B]	5[<B]	13[<B]	<5[<B]

Certified By:

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals (FWAL)

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

Comments:	RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Canadian Drinking Water Quality - updated 2019-03, B Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016 Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.
9985275	Metals analysis completed on a filtered sample.
9985282	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
9985283-9985284	Metals analysis completed on a filtered sample.
9985285	Metals analysis completed on a filtered sample. Ion Balance is biased high, contributing parameters have been confirmed.
9985286-9985289	Metals analysis completed on a filtered sample.
9985290-9985291	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
9985292-9985294	Metals analysis completed on a filtered sample.
9985295	Metals analysis completed on a filtered sample. Ion Balance is biased high, contributing parameters have been confirmed.
9985296-9985298	Metals analysis completed on a filtered sample.
9985299	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
9985300-9985357	Metals analysis completed on a filtered sample.
9985361	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
9985377-9985379	Metals analysis completed on a filtered sample.

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: CoBrien

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CANADA B3B 1M2
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FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

TSS

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

		SAMPLE DESCRIPTION:		FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A	FMS-HG18-05B
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21	2019-03-21
Parameter	Unit	G / S	RDL	9985275	9985282	9985283	9985284	9985285	9985286	9985287	9985288
Total Suspended Solids	mg/L		5	<5	<5	6	<5	<5	9	19	201

		SAMPLE DESCRIPTION:		FMS-HG18-06A	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-10A	FMS-HG18-10B	FMS-HG18-11A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-03-21	2019-03-21	2019-03-21	2019-03-22	2019-03-22	2019-03-22	2019-03-22	2019-03-21
Parameter	Unit	G / S	RDL	9985289	9985290	9985291	9985292	9985293	9985294	9985295	9985296
Total Suspended Solids	mg/L		5	10	26	137	<5	57	17	42	<5

		SAMPLE DESCRIPTION:		FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-03-21	2019-03-22	2019-03-22	2019-03-22	2019-03-22	2019-03-21	2019-03-21	2019-03-21
Parameter	Unit	G / S	RDL	9985297	9985298	9985299	9985300	9985301	9985339	9985357	9985361
Total Suspended Solids	mg/L		5	17	<5	14	28	<5	192	7	26

		SAMPLE DESCRIPTION:		DUP-A	DUP-B	DUP-C
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2019-03-21	2019-03-21	2019-03-22
Parameter	Unit	G / S	RDL	9985377	9985378	9985379
Total Suspended Solids	mg/L		5	7	161	18

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: CoBrien

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AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Water Analysis - Cyanide Water (Free)

DATE RECEIVED: 2019-03-22

DATE REPORTED: 2019-04-11

				SAMPLE DESCRIPTION:	FMS-HG18-15B	FMS-HG18-16B
				SAMPLE TYPE:	Water	Water
				DATE SAMPLED:	2019-03-21	2019-03-21
Parameter	Unit	G / S	RDL		9985339	9985361
Free Cyanide	mg/L	0.2	0.002		<0.002	<0.002

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Canadian Drinking Water Quality - updated 2019-03
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Certified By: CoBrien

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AGAT Laboratories

Guideline Violation

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
9985275	FMS-HG18-02A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Arsenic	ug/L	10	11
9985275	FMS-HG18-02A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	50 AO	70
9985275	FMS-HG18-02A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	3.6
9985275	FMS-HG18-02A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Arsenic	ug/L	5.0	11
9985275	FMS-HG18-02A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Copper	ug/L	2	14
9985282	FMS-HG18-02B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	1.6
9985282	FMS-HG18-02B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	pH		7.0-10.5 OG	6.02
9985282	FMS-HG18-02B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	5	89
9985282	FMS-HG18-02B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Cadmium	ug/L	0.01	0.018
9985282	FMS-HG18-02B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Copper	ug/L	2	3
9985283	FMS-HG18-03A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Arsenic	ug/L	10	16
9985283	FMS-HG18-03A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	50 AO	144
9985283	FMS-HG18-03A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	6.1
9985283	FMS-HG18-03A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Arsenic	ug/L	5.0	16
9985284	FMS-HG18-03B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	50 AO	143
9985284	FMS-HG18-03B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	1.5
9985284	FMS-HG18-03B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	pH		7.0-10.5 OG	6.87
9985284	FMS-HG18-03B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Cadmium	ug/L	0.01	0.019
9985284	FMS-HG18-03B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Copper	ug/L	2	3
9985284	FMS-HG18-03B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Silver	ug/L	0.1	0.2
9985285	FMS-HG18-04A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Arsenic	ug/L	10	31
9985285	FMS-HG18-04A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	50 AO	293
9985285	FMS-HG18-04A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	2.4
9985285	FMS-HG18-04A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Arsenic	ug/L	5.0	31
9985286	FMS-HG18-04B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Iron	ug/L	300 AO	574
9985286	FMS-HG18-04B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	50 AO	897
9985286	FMS-HG18-04B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	36.5
9985286	FMS-HG18-04B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	pH		7.0-10.5 OG	6.76
9985286	FMS-HG18-04B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Cadmium	ug/L	0.01	0.020
9985286	FMS-HG18-04B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Iron	ug/L	300	574
9985286	FMS-HG18-04B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	820	897
9985286	FMS-HG18-04B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Zinc	ug/L	30	1680
9985287	FMS-HG18-05A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Arsenic	ug/L	10	13
9985287	FMS-HG18-05A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	4.8
9985287	FMS-HG18-05A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	pH		7.0-10.5 OG	6.43
9985287	FMS-HG18-05A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Arsenic	ug/L	5.0	13
9985288	FMS-HG18-05B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	100 OG AO	480
9985288	FMS-HG18-05B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	50 AO	90
9985288	FMS-HG18-05B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	99.6
9985288	FMS-HG18-05B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	pH		7.0-10.5 OG	6.69
9985288	FMS-HG18-05B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	5	480
9985288	FMS-HG18-05B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Cadmium	ug/L	0.01	0.033
9985288	FMS-HG18-05B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Copper	ug/L	2	23

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AGAT Laboratories
11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Guideline Violation

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
9985289	FMS-HG18-06A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Arsenic	ug/L	10	47
9985289	FMS-HG18-06A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Iron	ug/L	300 AO	1990
9985289	FMS-HG18-06A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	50 AO	713
9985289	FMS-HG18-06A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	35.7
9985289	FMS-HG18-06A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	pH		7.0-10.5 OG	6.88
9985289	FMS-HG18-06A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	5	8
9985289	FMS-HG18-06A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Arsenic	ug/L	5.0	47
9985289	FMS-HG18-06A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Iron	ug/L	300	1990
9985290	FMS-HG18-08A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	18.6
9985291	FMS-HG18-08B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	32.7
9985291	FMS-HG18-08B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	pH		7.0-10.5 OG	6.63
9985291	FMS-HG18-08B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	5	87
9985292	FMS-HG18-09A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	50 AO	423
9985292	FMS-HG18-09A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	3.0
9985293	FMS-HG18-09B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Iron	ug/L	300 AO	738
9985293	FMS-HG18-09B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	50 AO	438
9985293	FMS-HG18-09B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	35.9
9985293	FMS-HG18-09B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	pH		7.0-10.5 OG	6.50
9985293	FMS-HG18-09B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Cadmium	ug/L	0.01	0.032
9985293	FMS-HG18-09B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Copper	ug/L	2	12
9985293	FMS-HG18-09B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Iron	ug/L	300	738
9985294	FMS-HG18-10A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	50 AO	123
9985294	FMS-HG18-10A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	8.5
9985294	FMS-HG18-10A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	5	9
9985295	FMS-HG18-10B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	16.9
9985295	FMS-HG18-10B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	5	66
9985295	FMS-HG18-10B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Cadmium	ug/L	0.01	0.020
9985296	FMS-HG18-11A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	50 AO	2570
9985296	FMS-HG18-11A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	1.5
9985296	FMS-HG18-11A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	pH		7.0-10.5 OG	6.88
9985296	FMS-HG18-11A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Cadmium	ug/L	0.01	0.077
9985296	FMS-HG18-11A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	820	2570
9985297	FMS-HG18-11B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	100 OG AO	208
9985297	FMS-HG18-11B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Iron	ug/L	300 AO	1050
9985297	FMS-HG18-11B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	50 AO	23200
9985297	FMS-HG18-11B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	19.5
9985297	FMS-HG18-11B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	pH		7.0-10.5 OG	6.42
9985297	FMS-HG18-11B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	5	208
9985297	FMS-HG18-11B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Cobalt	ug/L	10	25
9985297	FMS-HG18-11B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Copper	ug/L	2	4
9985297	FMS-HG18-11B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Iron	ug/L	300	1050
9985297	FMS-HG18-11B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	820	23200
9985298	FMS-HG18-13A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	2.3

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AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Guideline Violation

AGAT WORK ORDER: 19X449221

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
9985298	FMS-HG18-13A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	pH		7.0-10.5 OG	6.73
9985298	FMS-HG18-13A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	5	53
9985299	FMS-HG18-13B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	100 OG AO	103
9985299	FMS-HG18-13B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	50 AO	148
9985299	FMS-HG18-13B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	2.9
9985299	FMS-HG18-13B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	pH		7.0-10.5 OG	6.02
9985299	FMS-HG18-13B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	5	103
9985299	FMS-HG18-13B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Cadmium	ug/L	0.01	0.020
9985299	FMS-HG18-13B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Copper	ug/L	2	3
9985299	FMS-HG18-13B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Silver	ug/L	0.1	0.3
9985300	FMS-HG18-14A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	12.3
9985300	FMS-HG18-14A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Cadmium	ug/L	0.01	0.027
9985301	FMS-HG18-14B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	100 OG AO	113
9985301	FMS-HG18-14B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	pH		7.0-10.5 OG	6.36
9985301	FMS-HG18-14B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	5	113
9985301	FMS-HG18-14B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Cadmium	ug/L	0.01	0.045
9985339	FMS-HG18-15B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	50 AO	409
9985339	FMS-HG18-15B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	103
9985339	FMS-HG18-15B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	5	10
9985357	FMS-HG18-16A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	50 AO	187
9985357	FMS-HG18-16A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	5.0
9985357	FMS-HG18-16A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Silver	ug/L	0.1	0.4
9985361	FMS-HG18-16B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	100 OG AO	178
9985361	FMS-HG18-16B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	11.9
9985361	FMS-HG18-16B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	pH		7.0-10.5 OG	5.98
9985361	FMS-HG18-16B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	5	178
9985361	FMS-HG18-16B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Copper	ug/L	2	13
9985361	FMS-HG18-16B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Silver	ug/L	0.1	0.5
9985377	DUP-A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Arsenic	ug/L	10	11
9985377	DUP-A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	50 AO	70
9985377	DUP-A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	3.9
9985377	DUP-A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Arsenic	ug/L	5.0	11
9985377	DUP-A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Copper	ug/L	2	14
9985378	DUP-B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	100 OG AO	398
9985378	DUP-B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Manganese	ug/L	50 AO	83
9985378	DUP-B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	78.7
9985378	DUP-B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	5	398
9985378	DUP-B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Cadmium	ug/L	0.01	0.038
9985378	DUP-B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Copper	ug/L	2	22
9985379	DUP-C	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	Turbidity	NTU	0.1-1	2.5
9985379	DUP-C	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals (FWAL)	pH		7.0-10.5 OG	6.86
9985379	DUP-C	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals (FWAL)	Dissolved Aluminum	ug/L	5	72

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AGAT Laboratories
11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES
AGAT WORK ORDER: 19X449221
PROJECT: 1895674
ATTENTION TO: Glen Merkley
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Apr 11, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
Benzene	1	9989188	< 0.001	< 0.001	NA	< 0.001	81%	70%	130%	99%	70%	130%			
Toluene	1	9989188	< 0.001	< 0.001	NA	< 0.001	83%	70%	130%	105%	70%	130%			
Ethylbenzene	1	9989188	< 0.001	< 0.001	NA	< 0.001	85%	70%	130%	108%	70%	130%			
Xylene (Total)	1	9989188	< 0.002	< 0.002	NA	< 0.002	86%	70%	130%	106%	70%	130%			
C6-C10 (less BTEX)	1	9989188	< 0.01	< 0.01	NA	< 0.01	99%	70%	130%	121%	70%	130%	117%	70%	130%
>C10-C16 Hydrocarbons	1	BS Dup	1.15	1.12	2.6%	< 0.05	89%	70%	130%	90%	70%	130%	91%	70%	130%
>C16-C21 Hydrocarbons	1	BS Dup	4.36	4.32	0.9%	< 0.10	90%	70%	130%	90%	70%	130%	91%	70%	130%
>C21-C32 Hydrocarbons	1	BS Dup	2.33	2.33	0.0%	< 0.1	88%	70%	130%	90%	70%	130%	91%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. VPH matrix spike performed on different sample than duplicate.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
>C10-C16 Hydrocarbons	1	BS Dup	1.17	1.11	5.3%	< 0.05	95%	70%	130%	88%	70%	130%	90%	70%	130%
>C16-C21 Hydrocarbons	1	BS Dup	4.00	3.96	1.0%	< 0.10	94%	70%	130%	88%	70%	130%	90%	70%	130%
>C21-C32 Hydrocarbons	1	BS Dup	2.05	2.03	1.0%	< 0.1	100%	70%	130%	88%	70%	130%	90%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
Benzene	1	9989833	< 0.001	< 0.001	NA	< 0.001	78%	70%	130%	84%	70%	130%			
Toluene	1	9989833	< 0.001	< 0.001	NA	< 0.001	80%	70%	130%	87%	70%	130%			
Ethylbenzene	1	9989833	< 0.001	< 0.001	NA	< 0.001	79%	70%	130%	89%	70%	130%			
Xylene (Total)	1	9989833	0.004	0.003	NA	< 0.002	81%	70%	130%	91%	70%	130%			
C6-C10 (less BTEX)	1	9989833	0.02	0.01	NA	< 0.01	88%	70%	130%	106%	70%	130%	120%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. VPH matrix spike performed on different sample than duplicate.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
>C10-C16 Hydrocarbons	1	BS Dup	1.47	1.44	2.1%	< 0.05	112%	70%	130%	108%	70%	130%	115%	70%	130%
>C16-C21 Hydrocarbons	1	BS Dup	5.45	5.54	1.6%	< 0.10	113%	70%	130%	108%	70%	130%	115%	70%	130%
>C21-C32 Hydrocarbons	1	BS Dup	3.03	2.94	3.0%	< 0.1	118%	70%	130%	108%	70%	130%	115%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Certified By:

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES
AGAT WORK ORDER: 19X449221
PROJECT: 1895674
ATTENTION TO: Glen Merkley
SAMPLING SITE:
SAMPLED BY:

Water Analysis

RPT Date: Apr 11, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Mercury Analysis in Water (Total)															
Total Mercury	1	5379	< 0.026	< 0.026	NA	< 0.026	102%	80%	120%	94%	80%	120%	114%	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
COD, DOC, TP															
Chemical Oxygen Demand	9981836		<3	<3	NA	< 3	97%	80%	120%	NA			95%	80%	120%
Total Phosphorous as P	1	9982577	<0.03	<0.03	NA	< 0.03	94%	80%	120%		120%	120%	97%	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Standard Water Analysis + Dissolved Metals (FWAL)															
pH	9985275	9985275	7.95	7.96	0.1%	<	102%	80%	120%	NA	80%	120%	NA	80%	120%
Reactive Silica as SiO2	1	9978474	2.9	2.9	0.0%	< 0.5	96%	80%	120%		80%	120%	87%	80%	120%
Chloride	9984653		24	24	0.0%	< 1	95%	80%	120%	NA	80%	120%	NA	80%	120%
Fluoride	9984653		1.00	0.97	3.0%	< 0.12	109%	80%	120%	NA	80%	120%	NA	80%	120%
Sulphate	9984653		6	7	NA	< 2	108%	80%	120%	NA	80%	120%	95%	80%	120%
Alkalinity	9985275	9985275	76	76	0.0%	< 5	103%	80%	120%	NA	80%	120%	NA	80%	120%
True Color	9989158		17	16	NA	< 5	90%	80%	120%	NA			NA		
Turbidity	9985299	9985299	2.9	2.4	18.9%	< 0.1	100%	80%	120%	NA			NA		
Electrical Conductivity	9985275	9985275	181	181	0.0%	< 1	100%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrate as N	9984653		0.23	0.22	NA	< 0.05	97%	80%	120%	NA	80%	120%	100%	80%	120%
Nitrite as N	9984653		<0.05	<0.05	NA	< 0.05	105%	80%	120%	NA	80%	120%	114%	80%	120%
Ammonia as N	1	9985275	0.07	0.02	NA	< 0.03	100%	80%	120%		80%	120%	88%	80%	120%
Total Organic Carbon	1		1.1	1.1	NA	< 0.5	85%	80%	120%	NA	80%	120%	92%	80%	120%
Ortho-Phosphate as P	1	9984747	0.21	0.22	4.7%	< 0.01	90%	80%	120%		80%	120%	102%	80%	120%
Dissolved Sodium	9985300	9985300	10.0	10.4	3.9%	< 0.1	102%	80%	120%	117%	80%	120%	NA	70%	130%
Dissolved Potassium	9985300	9985300	1.0	0.9	10.5%	< 0.1	89%	80%	120%	96%	80%	120%	85%	70%	130%
Dissolved Calcium	9985300	9985300	11.3	12.9	13.2%	< 0.1	94%	80%	120%	100%	80%	120%	NA	70%	130%
Dissolved Magnesium	9985300	9985300	1.1	1.0	9.5%	< 0.1	98%	80%	120%	103%	80%	120%	NA	70%	130%
Bicarb. Alkalinity (as CaCO3)	9985275	9985275	76	76	0.0%	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	9985275	9985275	<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	9985275	9985275	<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Dissolved Aluminum	9985300	9985300	<5	6	NA	< 5	89%	80%	120%	95%	80%	120%	80%	70%	130%
Dissolved Antimony	9985300	9985300	<2	<2	NA	< 2	102%	80%	120%	120%	80%	120%	95%	70%	130%
Dissolved Arsenic	9985300	9985300	4	3	NA	< 2	92%	80%	120%	97%	80%	120%	91%	70%	130%
Dissolved Barium	9985300	9985300	14	13	NA	< 5	93%	80%	120%	102%	80%	120%	88%	70%	130%
Dissolved Beryllium	9985300	9985300	<2	<2	NA	< 2	93%	80%	120%	101%	80%	120%	101%	70%	130%
Dissolved Bismuth	9985300	9985300	<2	<2	NA	< 2	90%	80%	120%	104%	80%	120%	75%	70%	130%
Dissolved Boron	9985300	9985300	<5	5	NA	< 5	96%	80%	120%	102%	80%	120%	95%	70%	130%
Dissolved Cadmium	9985300	9985300	0.027	0.027	NA	< 0.09	91%	80%	120%	99%	80%	120%	97%	70%	130%
Dissolved Chromium	9985300	9985300	2	2	NA	< 1	99%	80%	120%	106%	80%	120%	119%	70%	130%

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES
AGAT WORK ORDER: 19X449221
PROJECT: 1895674
ATTENTION TO: Glen Merkley
SAMPLING SITE:
SAMPLED BY:

Water Analysis (Continued)

RPT Date: Apr 11, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Dissolved Cobalt	9985300	9985300	<1	<1	NA	< 1	93%	80%	120%	102%	80%	120%	113%	70%	130%
Dissolved Copper	9985300	9985300	<1	<1	NA	< 2	100%	80%	120%	108%	80%	120%	110%	70%	130%
Dissolved Iron	9985300	9985300	<50	<50	NA	< 50	94%	80%	120%	101%	80%	120%	103%	70%	130%
Dissolved Lead	9985300	9985300	<0.5	<0.5	NA	< 0.5	97%	80%	120%	102%	80%	120%	96%	70%	130%
Dissolved Manganese	9985300	9985300	19	18	5.4%	< 2	95%	80%	120%	101%	80%	120%	NA	70%	130%
Dissolved Molybdenum	9985300	9985300	<2	<2	NA	< 2	92%	80%	120%	99%	80%	120%	119%	70%	130%
Dissolved Nickel	9985300	9985300	<2	5	NA	< 2	93%	80%	120%	101%	80%	120%	98%	70%	130%
Dissolved Selenium	9985300	9985300	<1	<1	NA	< 1	95%	80%	120%	104%	80%	120%	95%	70%	130%
Dissolved Silver	9985300	9985300	<0.1	<0.1	NA	< 0.1	86%	80%	120%	91%	80%	120%	86%	70%	130%
Dissolved Strontium	9985300	9985300	74	72	2.7%	< 5	96%	80%	120%	100%	80%	120%	NA	70%	130%
Dissolved Thallium	9985300	9985300	<0.1	<0.1	NA	< 0.1	94%	80%	120%	101%	80%	120%	96%	70%	130%
Dissolved Tin	9985300	9985300	<2	<2	NA	< 2	95%	80%	120%	101%	80%	120%	120%	70%	130%
Dissolved Titanium	9985300	9985300	<2	<2	NA	< 2	90%	80%	120%	100%	80%	120%	108%	70%	130%
Dissolved Uranium	9985300	9985300	0.3	0.3	NA	< 0.1	91%	80%	120%	98%	80%	120%	96%	70%	130%
Dissolved Vanadium	9985300	9985300	<2	<2	NA	< 2	93%	80%	120%	99%	80%	120%	112%	70%	130%
Dissolved Zinc	9985300	9985300	<5	<5	NA	< 5	96%	80%	120%	100%	80%	120%	111%	70%	130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Standard Water Analysis + Dissolved Metals (FWAL)															
pH	9985291	9985291	6.63	6.33	4.6%	<	102%	80%	120%	NA	80%	120%	NA	80%	120%
Chloride	9989057		258	258	0.0%	< 1	88%	80%	120%	NA	80%	120%	NA	80%	120%
Fluoride	9989057		<0.12	<0.12	NA	< 0.12	93%	80%	120%	NA	80%	120%	106%	80%	120%
Sulphate	9989057		18	18	0.3%	< 2	109%	80%	120%	NA	80%	120%	NA	80%	120%
Alkalinity	9985291	9985291	5	<5	NA	< 5	103%	80%	120%	NA	80%	120%	NA	80%	120%
Electrical Conductivity	9985291	9985291	15	14	6.2%	< 1	101%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrate as N	9989057		<0.05	<0.05	NA	< 0.05	99%	80%	120%	NA	80%	120%	92%	80%	120%
Nitrite as N	9989057		0.82	0.84	2.6%	< 0.05	105%	80%	120%	NA	80%	120%	NA	80%	120%
Total Organic Carbon	9985287	9985287	<0.5	0.6	NA	< 0.5	85%	80%	120%	NA	80%	120%	92%	80%	120%
Bicarb. Alkalinity (as CaCO3)	9985291	9985291	5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	9985291	9985291	<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	9985291	9985291	<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Standard Water Analysis + Dissolved Metals (FWAL)															
Total Organic Carbon	9985297	9985297	2.3	2.2	NA	< 0.5	93%	80%	120%	NA	80%	120%	86%	80%	120%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Standard Water Analysis + Dissolved Metals (FWAL)															
Total Organic Carbon	9985379	9985379	0.6	0.5	NA	< 0.5	101%	80%	120%	NA	80%	120%	81%	80%	120%

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES
AGAT WORK ORDER: 19X449221
PROJECT: 1895674
ATTENTION TO: Glen Merkley
SAMPLING SITE:
SAMPLED BY:

Water Analysis (Continued)

RPT Date: Apr 11, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
TSS															
Total Suspended Solids	9985069		11	11	NA	< 5	100%	80%	120%	NA			112%	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Dissolved TP (Water)															
Total Phosphorus, Dissolved	9985275	9985275	<0.02	<0.02	NA	< 0.02	97%	90%	110%	106%	90%	110%	92%	80%	120%
Dissolved TP (Water)															
Total Phosphorus, Dissolved	9985301	9985301	<0.02	<0.02	NA	< 0.02	94%	90%	110%	98%	90%	110%	98%	80%	120%
Water Analysis - Cyanide Water (Free)															
Free Cyanide	9985339	9985339	<0.002	<0.002	NA	< 0.002	85%	80%	120%	105%	80%	120%	105%	80%	120%
Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.															

Certified By: CoBrien

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 19X449221

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SAMPLING SITE:

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Miscellaneous Analysis			
Subcontracted Data			
Trace Organics Analysis			
Benzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Toluene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Ethylbenzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Xylene (Total)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
C6-C10 (less BTEX)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
>C10-C16 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C16-C21 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C21-C32 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Modified TPH (Tier 1)	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	CALCULATION
Resemblance Comment	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
Return to Baseline at C32	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - VPH	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
n-Dotriacontane - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID

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AGAT WORK ORDER: 19X449221

PROJECT: 1895674

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SAMPLING SITE:

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Chemical Oxygen Demand	INORG-121-6013	SM 5220 B	SPECTROPHOTOMETER
Dissolved Organic Carbon	INOR-121-6026	SM 5310 B	TOC ANALYZER
Total Phosphorous as P	INORG-121-6009	SM 365.2	COLORIMETER
Total Cyanide	INORG-121-		COLORIMETER
Total Phosphorus, Dissolved	INOR-93-6022	SM 4500-P B&E	SPECTROPHOTOMETER
Dissolved Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
Total Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
pH	INOR-121-6001	SM 4500 H+B	PC TITRATE
Reactive Silica as SiO2	INOR-121-6027	SM 4110 B	COLORIMETER
Chloride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Fluoride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Alkalinity	INOR-121-6001	SM 2320 B	
True Color	INOR-121-6014	SM 2120 C	NEPHELOMETER
Turbidity	INOR-121-6022	SM 2130 B	NEPHELOMETER
Electrical Conductivity	INOR-121-6001	SM 2510 B	PC TITRATE
Nitrate + Nitrite as N	INORG-121-6005	SM 4110 B	CALCULATION
Nitrate as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-121-6047	SM 4500-NH3 G	COLORIMETER
Total Organic Carbon	INOR-121-6026	SM 5310 B	TOC ANALYZER
Ortho-Phosphate as P	INOR-121-6012	SM 4110 B	COLORIMETER
Dissolved Sodium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Potassium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Calcium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Magnesium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Bicarb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Carb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Hydroxide	INORG-121-6001	SM 2320 B	PC-TITRATE
Calculated TDS	CALCULATION	SM 1030E	CALCULATION
Hardness	CALCULATION	SM 2340B	CALCULATION
Langelier Index (@20C)	CALCULATION	CALCULATION	CALCULATION
Langelier Index (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 20C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Anion Sum	CALCULATION	SM 1030E	CALCULATION
Cation sum	CALCULATION	SM 1030E	CALCULATION
% Difference/ Ion Balance	CALCULATION	SM 1030E	CALCULATION
Dissolved Aluminum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Antimony	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Arsenic	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS

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PROJECT: 1895674

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Dissolved Barium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Beryllium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Bismuth	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Boron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cadmium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Chromium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cobalt	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Lead	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Molybdenum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Nickel	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Phosphorus	MET-121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Selenium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Silver	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Strontium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Thallium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Tin	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Titanium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Uranium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Vanadium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Suspended Solids	INOR-121-6024, 6025	SM 2540C, D	GRAVIMETRIC
Free Cyanide	INST 0310	EPA 335.3	CONTINUOUS FLOW ANALYZER

Results relate only to the items tested. Results apply to samples as received.

AGAT Laboratories

Unit 122 ▪ 11 Morris Drive
Dartmouth, NS
B3B 1M2
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P: 902.468.8718 ▪ F: 902.468.8924

Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: 6.0, 5.8, 7.1
Hold Time:
AGAT Job Number: 19x449221
Notes: No TSS bottles received.

Report Information
Company: Golder Associates
Contact: Glen Merkley
Address: 201 Brownlow Avenue, Suite 26
Dartmouth, NS, B3B 1W2
Phone: 9024661668 Fax: 9024661669
Client Project #: 1895674
AGAT Quotation: 204505
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Glen Merkley
Email: glen_merkley@golder.com
2. Name: Sheri Burton
Email: sheri_burton@golder.com

Report Format
☐ Single Sample per page
☑ Multiple Sample per page
☑ Excel Format Included
☐ Export:

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required:

Invoice To Same Yes ☑ / No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☑ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☑ Other NSE PSS - GW to SW <10m

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample:** ☐ Yes ☐ No
Reg. No.:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment
FMS-HG18-02A	Mar 21/19 - 10:15	GW	11 13	Field filtered for dissolved metals
FMS-HG18-02B	Mar 21/19 - 10:45	GW	11	Field filtered for dissolved metals
FMS-HG18-03A	Mar 21/19 - 11:30	GW	11	Field filtered for dissolved metals
FMS-HG18-03B	Mar 21/19 - 11:45	GW	11	Field filtered for dissolved metals
FMS-HG18-04A	Mar 21/19 - 15:10	GW	11	Field filtered for dissolved metals
FMS-HG18-04B	Mar 21/19 - 15:25	GW	11	Field filtered for dissolved metals
FMS-HG18-05A	Mar 21/19 - 14:15	GW	11	Field filtered for dissolved metals
FMS-HG18-05B	Mar 21/19 - 14:30	GW	11	Field filtered for dissolved metals
FMS-HG18-06A	Mar 21/19 - 16:30	GW	11	Field filtered for dissolved metals
FMS-HG18-08A	Mar 21/19 - 13:30	GW	11	Field filtered for dissolved metals
FMS-HG18-08B	Mar 21/19 - 13:45	GW	11	Field filtered for dissolved metals
FMS-HG18-09A	Mar 22/19 - 10:15	GW	11	Field filtered for dissolved metals

Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☑ Diss ☐ Available	Mercury (Total + Diss.)	☐ BOD ☐ CBOD DOC + COD	pH	☑ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus + Diss. (Miss.)	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Total and Free Cyanide	Other: Radium-226	Hazardous (Y/N)
	✓	✓	✓	✓		✓		✓		✓												✓	
	✓	✓	✓	✓		✓		✓		✓												✓	
	✓	✓	✓	✓		✓		✓		✓												✓	
	✓	✓	✓	✓		✓		✓		✓												✓	
	✓	✓	✓	✓		✓		✓		✓												✓	
	✓	✓	✓	✓		✓		✓		✓												✓	
	✓	✓	✓	✓		✓		✓		✓												✓	
	✓	✓	✓	✓		✓		✓		✓												✓	
	✓	✓	✓	✓		✓		✓		✓												✓	
	✓	✓	✓	✓		✓		✓		✓												✓	
	✓	✓	✓	✓		✓		✓		✓												✓	
	✓	✓	✓	✓		✓		✓		✓												✓	

Samples Relinquished By (Print Name): Cody Mackenzie — Date/Time: 2019/03/22 3:45 pm
Samples Relinquished By (Sign): Cody Mackenzie — Date/Time: 2019/03/22 3:45 pm
Samples Received By (Print Name): C. Deamel — Date/Time: Mar 22/19
Samples Received By (Sign): — Date/Time: 15:40

Pink Copy - Client
Yellow Copy - AGAT
White Copy- AGAT

Page 1 of 3
N°:

Document ID: DIV-133-1501 002

Note: Copper RDL = 1.0 mg/L Mercury RDL = 0.016 mg/L

Date revised: January 2016

AGAT Laboratories

Unit 122 • 11 Morris Drive
Dartmouth, NS
B3B 1M2
webearth.agatlabs.com • www.agatlabs.com

Chain of Custody Record

P: 902.468.8718 • F: 902.468.8924

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: _____
Hold Time: _____
AGAT Job Number: 19x449221
Notes:

Report Information
Company: Golder Associates
Contact: Glen Merkley
Address: 201 Brownlow Avenue, Suite 26
Dartmouth, NS, B3B 1W2
Phone: 9024661668 Fax: 9024661669
Client Project #: 1895674
AGAT Quotation: 204505
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Glen Merkley
Email: glen_merkley@golder.com
2. Name: Sheri Burton
Email: sheri_burton@golder.com

Report Format
☐ Single Sample per page
☑ Multiple Sample per page
☑ Excel Format Included
☐ Export:

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required: _____

Invoice To Same Yes ☑ / No ☐
Company: _____
Contact: _____
Address: _____
Phone: _____ Fax: _____
PO/Credit Card#: _____

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☑ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☑ Other NSE PSS - GW to SW <10m

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample:** ☐ Yes ☐ No
Reg. No.: _____

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☑ Diss ☐ Available	Mercury (Total + Diss.)	☐ BOD ☐ CBOD DOC + COD	pH	☑ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus + Diss. (Miss.)	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Total and Free Cyanide	Other: Radium-226	Hazardous (Y/N)
FMS-HG18-09B	Mar 22/19 - 10:30	GW	11 13	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-10A	Mar 22/19 - 9:50	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-10B	Mar 22/19 - 10:00	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-11A	Mar 21/19 - 12:40	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-11B	Mar 21/19 - 13:00	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-13A	Mar 22/19 - 9:00	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-13B	Mar 22/19 - 9:20	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-14A	Mar 22/19 - 11:15	GW	11	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-14B	Mar 22/19 - 11:30	GW	11 ✓	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-15B	Mar 21/19 - 16:00	GW	~~13~~ 15	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓										✓		✓	
FMS-HG18-16A	Mar 21/19 - 9:30	GW	~~11~~ 13	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓												✓	
FMS-HG18-16B	Mar 21/19 - 9:15	GW	~~13~~ 15	Field filtered for dissolved metals		✓	✓	✓	✓		✓		✓		✓										✓		✓	

Samples Relinquished By (Print Name)	Date/Time	Samples Received By (Print Name)	Date/Time
		C. Deamel	Mar 22/19
Samples Relinquished By (Sign)	Date/Time	Samples Received By (Sign)	Date/Time
			15:40

Pink Copy - Client
Yellow Copy - AGAT
White Copy - AGAT

Page 2 of 3
N°:

Document ID: DW-133-1501.002
Date revised: January 2016

Note: Copper RDL = 1.0 mg/L Mercury RDL = 0.0016 mg/L

AGAT Laboratories
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B3B 1M2
webearth.agatlabs.com ▪ www.agatlabs.com
P: 902.468.8718 ▪ F: 902.468.8924

Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: _____
Hold Time: _____
AGAT Job Number: 19x449221
Notes:

Report Information
Company: Golder Associates
Contact: Glen Merkley
Address: 201 Brownlow Avenue, Suite 26
Dartmouth, NS, B3B 1W2
Phone: 9024661668 Fax: 9024661669
Client Project #: 1895674
AGAT Quotation: 204505
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Glen Merkley
Email: glen_merkley@golder.com
2. Name: Sheri Burton
Email: sheri_burton@golder.com

Report Format
☐ Single Sample per page
☑ Multiple Sample per page
☑ Excel Format Included
☐ Export:

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required: _____

Invoice To Same Yes ☑ / No ☐
Company: _____
Contact: _____
Address: _____
Phone: _____ Fax: _____
PO/Credit Card#: _____

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ Industrial ☐ Commercial ☐ Res/Park ☐ Agricultural ☐ FWAL ☐ Sediment
☑ CDWQ ☐ NSEQS-Cont Sites ☐ HRM 101 ☐ Storm Water ☐ Waste Water
☑ Other NSE PSS - GW to SW <10m

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample:** ☐ Yes ☐ No
Reg. No.: _____

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment
DUP-A	Mar 21/19 - 10:15	GW	13	Field filtered for dissolved metals
DUP-B	Mar 21/19 - 14:30	GW	13	Field filtered for dissolved metals
DUP-C	Mar 22/19 - 9:00	GW	13	Field filtered for dissolved metals

Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☑ Diss ☐ Available	Mercury (Total + Diss.)	☐ BOD ☐ CBOD DOC + COD	pH	☑ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus + Diss. (Miss.)	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Total and Free Cyanide	Other: Radium-226	Hazardous (Y/N)
	✓	✓	✓	✓		✓		✓		✓												✓	
	✓	✓	✓	✓		✓		✓		✓												✓	
	✓	✓	✓	✓		✓		✓		✓												✓	

Samples Relinquished By (Print Name): _____ Date/Time _____
Samples Relinquished By (Sign): Cody Mar Date/Time _____
Samples Received By (Print Name): C Deamel Date/Time Mar 22/19
Samples Received By (Sign): Deamel Date/Time 15:40

Pink Copy - Client
Yellow Copy - AGAT
White Copy- AGAT

Page 3 of 3
N°:

Document ID: DW-133-1501.002

Note: Copper RDL = 1.0 ug/L Mercury RDL = 0.0016 ug/L

Date revised: January 2016

SASKATCHEWAN RESEARCH COUNCIL

Environmental Analytical Laboratories
143-111 Research Drive, Saskatoon, SK Canada S7N 3R2

T: 306-933-6932 **F:** 306-933-7922
Toll-free: 1-800-240-8808
E: analytical@src.sk.ca

www.src.sk.ca/analytical

SRC Group # 2019-3388

Apr 05, 2019

AGAT Laboratories
122-11 Morris Drive
Dartmouth, NS B3B 1M2
Attn: Janetta Fraser

Date Samples Received: Mar-26-2019 Client P.O.: 136118

All results have been reviewed and approved by a Qualified Person in accordance with the Saskatchewan Environmental Code, Corrective Action Plan Chapter, for the purposes of certifying a laboratory analysis

Results from Lab Sections 1 and 2 have been authorized by Keith Gipman, Supervisor
Results from Lab Section 3 and 7 have been authorized by Pat Moser, Supervisor
Results from Lab Sections 4 and 5 have been authorized by Vicky Snook, Supervisor
Results from Lab Section 6 have been authorized by Marion McConnell, Supervisor

---

* Test methods and data are validated by the laboratory's Quality Assurance Program.

* Routine methods follow recognized procedures from sources such as
    * Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF
    * Environment Canada
    * US EPA
    * CANMET

* The results reported relate only to the test samples as provided by the client.

* Samples will be kept for 30 days after the final report is sent. Please contact the lab if you have any special requirements.

* Additional information is available upon request.

This is a final report.

SASKATCHEWAN RESEARCH COUNCIL

Environmental Analytical Laboratories
143-111 Research Drive, Saskatoon, SK Canada S7N 3R2

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SRC Group # 2019-3388

Apr 05, 2019

AGAT Laboratories

122-11 Morris Drive
Dartmouth, NS B3B 1M2
Attn: Janetta Fraser

Date Samples Received: Mar-26-2019 Client P.O.: 136118

14426	**03/21/2019**	**19X449221-9985275-FMS-HG18-02A *WATER***
14427	**03/21/2019**	**19X449221-9985282-FMS-HG18-02B *WATER***
14428	**03/21/2019**	**19X449221-9985283-FMS-HG18-03A *WATER***

Analyte	Units	14426	14427	14428
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	<0.005	<0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 12 °C upon receipt.

SASKATCHEWAN RESEARCH COUNCIL

Environmental Analytical Laboratories
143-111 Research Drive, Saskatoon, SK Canada S7N 3R2

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SRC Group # 2019-3388

Apr 05, 2019

AGAT Laboratories

14429	**03/21/2019**	**19X449221-9985284-FMS-HG18-03B *WATER***
14430	**03/21/2019**	**19X449221-9985285-FMS-HG18-04A *WATER***
14431	**03/21/2019**	**19X449221-9985286-FMS-HG18-04B *WATER***

Analyte	Units	14429	14430	14431
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	0.008	<0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 12 °C upon receipt.

SASKATCHEWAN RESEARCH COUNCIL

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SRC Group # 2019-3388

Apr 05, 2019

AGAT Laboratories

14432	**03/21/2019**	**19X449221-9985287-FMS-HG18-05A *WATER***
14433	**03/21/2019**	**19X449221-9985288-FMS-HG18-05B *WATER***
14434	**03/21/2019**	**19X449221-9985289-FMS-HG18-06A *WATER***

Analyte	Units	14432	14433	14434
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.005	0.006	<0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 12 °C upon receipt.

SASKATCHEWAN RESEARCH COUNCIL

Environmental Analytical Laboratories
143-111 Research Drive, Saskatoon, SK Canada S7N 3R2

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SRC Group # 2019-3388

Apr 05, 2019

AGAT Laboratories

14435	**03/21/2019 19X449221-9985290-FMS-HG18-08A *WATER***
14436	**03/21/2019 19X449221-9985291 FMS-HG18-08B *WATER***
14437	**03/22/2019 19X449221-9985292 FMS-HG18-09A *WATER***

Analyte	Units	14435	14436	14437
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	<0.005	0.02

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Note for Sample # 14437
This sample was reanalyzed for Radium 226. Reanalysis confirms original results are within the expected measurement uncertainty.

The temperature of the cooler was 12 °C upon receipt.

SASKATCHEWAN RESEARCH COUNCIL

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143-111 Research Drive, Saskatoon, SK Canada S7N 3R2

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SRC Group # 2019-3388

Apr 05, 2019

AGAT Laboratories

14438	**03/22/2019**	**19X449221-9985293**	**FMS-HG18-09B *WATER***
14439	**03/22/2019**	**19X449221-9985294**	**FMS-HG18-10A *WATER***
14440	**03/22/2019**	**19X449221-9985295**	**FMS-HG18-10B *WATER***

Analyte	Units	14438	14439	14440
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	0.005	<0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 12 °C upon receipt.

SASKATCHEWAN RESEARCH COUNCIL

Environmental Analytical Laboratories
143-111 Research Drive, Saskatoon, SK Canada S7N 3R2

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SRC Group # 2019-3388

Apr 05, 2019

AGAT Laboratories

14441	**03/21/2019**	**19X449221-9985296**	**FMS-HG18-11A**	***WATER***
14442	**03/22/2019**	**19X449221-9985297**	**FMS-HG18-11B**	***WATER***
14443	**03/22/2019**	**19X449221-9985298**	**FMS-HG18-13A**	***WATER***

Analyte	Units	14441	14442	14443
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	<0.005	0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 12 °C upon receipt.

SASKATCHEWAN RESEARCH COUNCIL

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SRC Group # 2019-3388

Apr 05, 2019

AGAT Laboratories

14444	**03/22/2019 19X449221-9985299 FMS-HG18-13B *WATER***
14445	**03/22/2019 19X449221-9985300 FMS-HG18-14A *WATER***
14446	**03/22/2019 19X449221-9985301-FMS-HG18-14B *WATER***

Analyte	Units	14444	14445	14446
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	0.006	<0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 12 °C upon receipt.

SASKATCHEWAN RESEARCH COUNCIL

Environmental Analytical Laboratories
143-111 Research Drive, Saskatoon, SK Canada S7N 3R2

T: 306-933-6932 **F:** 306-933-7922
Toll-free: 1-800-240-8808
E: analytical@src.sk.ca

www.src.sk.ca/analytical

SRC Group # 2019-3388

Apr 05, 2019

AGAT Laboratories

14447	**03/21/2019**	**19X449221-9985339-FMS-HG18-15B *WATER***
14448	**03/21/2019**	**19X449221-9985357-FMS-HG18-16A *WATER***
14449	**03/21/2019**	**19X449221-9985361-FMS-HG18-16B *WATER***

Analyte	Units	14447	14448	14449
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	0.01	0.007

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 12 °C upon receipt.

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SRC Group # 2019-3388

Apr 05, 2019

AGAT Laboratories

14450	**03/21/2019**	**19X449221-9985377-DUP-A *WATER***
14451	**03/21/2019**	**19X449221-9985378-DUP-B *WATER***
14452	**03/22/2019**	**19X449221-9985379-DUP-C *WATER***

Analyte	Units	14450	14451	14452
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	<0.005	<0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 12 °C upon receipt.

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES
201 Brownlow Avenue, Suite 26
DARTMOUTH, NS B3B 1W2
(902) 466-1668

ATTENTION TO: Sheri Burton

PROJECT: 1895674

AGAT WORK ORDER: 19X477047

MISCELLANEOUS ANALYSIS REVIEWED BY: Courtney O Brien, Data Reporter, B.Eng., EIT

TRACE ORGANICS REVIEWED BY: Amy Hunter, Trace Organics Supervisor, B.Sc.

WATER ANALYSIS REVIEWED BY: Courtney O Brien, Data Reporter, B.Eng., EIT

DATE REPORTED: Jun 27, 2019

PAGES (INCLUDING COVER): 42

VERSION*: 2

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

*NOTES
VERSION 2:Version 2.0 supersedes version 1.0; updated Strontium guideline

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA)
Western Enviro-Agricultural Laboratory Association (WEALA)
Environmental Services Association of Alberta (ESAA)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.

Results relate only to the items tested. Results apply to samples as received.
All reportable information as specified by ISO 17025:2017 is available from AGAT Laboratories upon request

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Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Subcontracted Data Received

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

		SAMPLE DESCRIPTION:		FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A	FMS-HG18-05B
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255833	255872	255873	255874	255875	255876	255877	255878
Subcontracted Data				Y	Y	Y	Y	Y	Y	Y	Y

		SAMPLE DESCRIPTION:		FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-10A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255879	255880	255881	255882	255883	255884	255885	255886
Subcontracted Data				Y	Y	Y	Y	Y	Y	Y	Y

		SAMPLE DESCRIPTION:		FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255887	255888	255889	255890	255891	255892	255893	255894
Subcontracted Data				Y	Y	Y	Y	Y	Y	Y	Y

		SAMPLE DESCRIPTION:		FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A	DUP-B	DUP-C
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255895	255896	255897	255898	255899	255900
Subcontracted Data				Y	Y	Y	Y	Y	Y

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: CoBrien

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Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

SAMPLE DESCRIPTION:					FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255833	255872	255873	255874	255875	255876	255877
Benzene	mg/L	0.005	2.1	0.001	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		1.5	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Resemblance Comment					NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32					Y	Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits									
Isobutylbenzene - EPH	%	70-130			94	95	101	99	111	110	103
Isobutylbenzene - VPH	%	70-130			81	83	86	71	85	89	89
n-Dotriacontane - EPH	%	70-130			95	96	99	99	110	107	106

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

					SAMPLE DESCRIPTION:	FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL		255878	255879	255880	255881	255882	255883	255884
Benzene	mg/L	0.005	2.1	0.001		<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001		<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001		<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002		<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		1.5	0.1		<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Resemblance Comment						NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32						Y	Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits										
Isobutylbenzene - EPH	%	70-130				98	112	103	97	113	105	113
Isobutylbenzene - VPH	%	70-130				86	86	88	87	83	88	85
n-Dotriacontane - EPH	%	70-130				100	115	106	101	112	109	113

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AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

					SAMPLE DESCRIPTION:	FMS-HG18-09B	FMS-HG18-10A	FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL		255885	255886	255887	255888	255889	255890	255891
Benzene	mg/L	0.005	2.1	0.001		<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001		<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001		<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002		<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		1.5	0.1		<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Resemblance Comment						NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32						Y	Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits										
Isobutylbenzene - EPH	%	70-130				98	104	110	115	94	101	108
Isobutylbenzene - VPH	%	70-130				85	85	85	83	85	81	80
n-Dotriacontane - EPH	%	70-130				103	106	110	116	100	104	109

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

SAMPLE DESCRIPTION:					FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15A	FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255892	255893	255894	255895	255896	255897	255898
Benzene	mg/L	0.005	2.1	0.001	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		1.5	0.1	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Resemblance Comment					NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32					Y	Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits									
Isobutylbenzene - EPH	%	70-130			107	109	91	108	107	96	95
Isobutylbenzene - VPH	%	70-130			85	85	86	85	83	82	73
n-Dotriacontane - EPH	%	70-130			111	107	88	111	109	96	94

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

					SAMPLE DESCRIPTION:	DUP-B	DUP-C
					SAMPLE TYPE:	Water	Water
					DATE SAMPLED:	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL		255899	255900
Benzene	mg/L	0.005	2.1	0.001		<0.001[<A]	<0.001[<A]
Toluene	mg/L	0.06, 0.024	0.77	0.001		<0.001[<B]	<0.001[<B]
Ethylbenzene	mg/L	0.14, 0.0016	0.32	0.001		<0.001[<B]	<0.001[<B]
Xylene (Total)	mg/L	0.09, 0.02	0.33	0.002		<0.002[<B]	<0.002[<B]
C6-C10 (less BTEX)	mg/L			0.01		<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L			0.05		<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L			0.10		<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L			0.1		<0.1	<0.1
Modified TPH (Tier 1)	mg/L		1.5	0.1		<0.1[<B]	<0.1[<B]
Resemblance Comment						NR	NR
Return to Baseline at C32						Y	Y
Surrogate	Unit	Acceptable Limits					
Isobutylbenzene - EPH	%	70-130				98	108
Isobutylbenzene - VPH	%	70-130				74	88
n-Dotriacontane - EPH	%	70-130				97	112

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Canadian Drinking Water Quality - updated 2019-05, B Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

255833-255900 Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

Results relate only to the items tested. Results apply to samples as received.

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Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Cyanide (Water)

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

		SAMPLE DESCRIPTION:		FMS-HG18-07B	FMS-HG18-15B	FMS-HG18-16B
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255881	255895	255897
Free Cyanide	µg/L		2	<2	<2	<2
Total Cyanide	mg/L	0.005	0.002	<0.002	<0.002	<0.002

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By: CoBrien

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AGAT Laboratories
11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Dissolved Total Phosphorus (Water)

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

		SAMPLE DESCRIPTION:		FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A	FMS-HG18-05B
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255833	255872	255873	255874	255875	255876	255877	255878
Total Phosphorus, Dissolved	mg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

		SAMPLE DESCRIPTION:		FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-10A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255879	255880	255881	255882	255883	255884	255885	255886
Total Phosphorus, Dissolved	mg/L		0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02

		SAMPLE DESCRIPTION:		FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255887	255888	255889	255890	255891	255892	255893	255894
Total Phosphorus, Dissolved	mg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

		SAMPLE DESCRIPTION:		FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A	DUP-B	DUP-C
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255895	255896	255897	255898	255899	255900
Total Phosphorus, Dissolved	mg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: CoBrien

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CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Mercury Analysis in Water (Dissolved)

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

				SAMPLE DESCRIPTION:	FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255833	255872	255873	255874	255875	255876	255877
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

				SAMPLE DESCRIPTION:	FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255878	255879	255880	255881	255882	255883	255884
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

				SAMPLE DESCRIPTION:	FMS-HG18-09B	FMS-HG18-10A	FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255885	255886	255887	255888	255889	255890	255891
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

				SAMPLE DESCRIPTION:	FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15A	FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255892	255893	255894	255895	255896	255897	255898
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

				SAMPLE DESCRIPTION:	DUP-B	DUP-C
				SAMPLE TYPE:	Water	Water
				DATE SAMPLED:	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255899	255900
Dissolved Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Canadian Drinking Water Quality - updated 2019-05, B Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016
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Analysis performed at AGAT Halifax (unless marked by *)

Certified By: CoBrien

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CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Mercury Analysis in Water (Total)

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

SAMPLE DESCRIPTION:					FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255833	255872	255873	255874	255875	255876	255877
Total Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

SAMPLE DESCRIPTION:					FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255878	255879	255880	255881	255882	255883	255884
Total Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

SAMPLE DESCRIPTION:					FMS-HG18-09B	FMS-HG18-10A	FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255885	255886	255887	255888	255889	255890	255891
Total Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

SAMPLE DESCRIPTION:					FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15A	FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255892	255893	255894	255895	255896	255897	255898
Total Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]	<0.016[<B]

SAMPLE DESCRIPTION:					DUP-B	DUP-C
SAMPLE TYPE:					Water	Water
DATE SAMPLED:					2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255899	255900
Total Mercury	ug/L	1	0.026	0.016	<0.016[<B]	<0.016[<B]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Canadian Drinking Water Quality - updated 2019-05, B Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016
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Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

					SAMPLE DESCRIPTION:	FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
					SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
					DATE SAMPLED:	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL		255833	255872	255873	255874	255875	255876	255877
pH			7.0-10.5 OG			7.96	5.19	7.60	6.57	8.10	6.70	6.72
Reactive Silica as SiO2	mg/L			0.5		8.6	3.3	11.0	4.1	9.6	6.7	7.6
Chloride	mg/L		250 AO	1		3	3	4	2	2	3	3
Fluoride	mg/L		1.5	0.12		<0.12[<B]	<0.12[<B]	<0.12[<B]	<0.12[<B]	<0.12[<B]	<0.12[<B]	<0.12[<B]
Sulphate	mg/L		500 AO	2		12	2	21	<2	6	3	2
Alkalinity	mg/L			5		69	<5	35	<5	142	11	10
True Color	TCU		15 AO	5		<5	<5	<5	<5	<5	8	<5
Turbidity	NTU		0.1-1	0.1		3.2	9.4	9.0	9.6	3.1	10.9	1.9
Electrical Conductivity	umho/cm			1		177	47	145	28	283	46	52
Nitrate + Nitrite as N	mg/L			0.05		0.08	1.08	0.11	0.32	<0.05	<0.05	0.41
Nitrate as N	mg/L		10	0.05		0.08[<B]	1.08[<B]	0.11[<B]	0.32[<B]	<0.05[<B]	<0.05[<B]	0.41[<B]
Nitrite as N	mg/L		1.0	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Ammonia as N	mg/L			0.03		0.04	0.04	<0.03	0.03	0.07	<0.03	0.04
Ortho-Phosphate as P	mg/L			0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L		200 AO	0.1		6.7	2.6	9.2	1.9	29.8	4.4	2.5
Dissolved Potassium	mg/L			0.1		1.9	0.4	1.0	0.6	2.1	0.6	2.5
Dissolved Calcium	mg/L			0.1		25.5	0.8	9.5	2.0	16.0	1.8	3.6
Dissolved Magnesium	mg/L			0.1		2.5	0.5	0.8	0.4	3.6	0.7	0.8
Bicarb. Alkalinity (as CaCO3)	mg/L			5		69	<5	35	<5	142	11	10
Carb. Alkalinity (as CaCO3)	mg/L			10		<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L			5		<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L		500 AO	1		93	14	67	8	145	21	22
Hardness	mg/L					74.0	4.1	27.0	6.6	54.8	7.4	12.3
Langelier Index (@20C)	NA					-0.38	-5.72	-1.45	-3.93	-0.15	-3.52	-3.25
Langelier Index (@ 4C)	NA					-0.70	-6.04	-1.77	-4.25	-0.47	-3.84	-3.57
Saturation pH (@ 20C)	NA					8.34	10.9	9.05	10.5	8.25	10.2	9.97
Saturation pH (@ 4C)	NA					8.66	11.2	9.37	10.8	8.57	10.5	10.3
Anion Sum	me/L					1.72	0.20	1.26	0.08	3.02	0.37	0.36
Cation sum	me/L					1.82	0.22	0.98	0.23	2.46	0.38	0.42
% Difference/ Ion Balance	%					3.0	4.7	12.5	49.5	10.3	2.0	8.5

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

SAMPLE DESCRIPTION:					FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255833	255872	255873	255874	255875	255876	255877
Dissolved Aluminum	ug/L	5	100 OG AO	5	<5[<A]	77[>A]	14[>A]	<5[<A]	6[>A]	<5[<A]	5[A]
Dissolved Antimony	ug/L	20	6	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Arsenic	ug/L	5.0	10	2	12[>B]	<2[<A]	8[A-B]	<2[<A]	33[>B]	<2[<A]	12[>B]
Dissolved Barium	ug/L	1000	1000	5	10[<A]	10[<A]	7[<A]	5[<A]	7[<A]	10[<A]	9[<A]
Dissolved Beryllium	ug/L	5.3		2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Bismuth	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	1200	5000	5	12[<A]	<5[<A]	<5[<A]	<5[<A]	16[<A]	<5[<A]	<5[<A]
Dissolved Cadmium	ug/L	0.01	5	0.017	<0.017[<B]	<0.017[<B]	<0.017[<B]	<0.017[<B]	<0.017[<B]	0.043[A-B]	<0.017[<B]
Dissolved Chromium	ug/L	-	50	1	<1[<B]	<1[<B]	<1[<B]	<1[<B]	2[<B]	<1[<B]	<1[<B]
Dissolved Cobalt	ug/L	10		1	<1[<A]	<1[<A]	<1[<A]	<1[<A]	<1[<A]	8[<A]	<1[<A]
Dissolved Copper	ug/L	2	1000 AO	1	15[>A]	8[>A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Iron	ug/L	300	300 AO	50	<50[<A]	<50[<A]	<50[<A]	<50[<A]	<50[<A]	69[<A]	<50[<A]
Dissolved Lead	ug/L	1	5	0.5	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]
Dissolved Manganese	ug/L	820	20 AO	2	47[<A]	32[<A]	316[<A]	42[<A]	242[<A]	463[<A]	3[<A]
Dissolved Molybdenum	ug/L	73		2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	7[<A]	<2[<A]	<2[<A]
Dissolved Nickel	ug/L	25		2	<2[<A]	<2[<A]	<2[<A]	3[<A]	<2[<A]	15[<A]	<2[<A]
Dissolved Phosphorus	mg/L			0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	1.0	50	1	<1[<A]	<1[<A]	<1[<A]	<1[<A]	<1[<A]	<1[<A]	<1[<A]
Dissolved Silver	ug/L	0.1		0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	0.4[>A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dissolved Strontium	ug/L	21000	7000	5	189[<B]	8[<B]	52[<B]	10[<B]	112[<B]	9[<B]	20[<B]
Dissolved Thallium	ug/L	0.8		0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dissolved Tin	ug/L	-		2	<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Uranium	ug/L	300	20	0.1	2.6[<B]	<0.1[<B]	0.6[<B]	<0.1[<B]	7.8[<B]	<0.1[<B]	<0.1[<B]
Dissolved Vanadium	ug/L	6		2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Zinc	ug/L	30	5000 AO	5	<5[<A]	<5[<A]	<5[<A]	<5[<A]	<5[<A]	268[>A]	<5[<A]

Certified By: CoBrien

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AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

			SAMPLE DESCRIPTION:		FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A
			SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water
			DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255878	255879	255880	255881	255882	255883	255884
pH			7.0-10.5 OG		6.63	6.64	7.98	6.60	7.55	6.25	7.72
Reactive Silica as SiO2	mg/L			0.5	6.2	8.0	13.6	6.5	7.7	2.6	14.9
Chloride	mg/L		250 AO	1	2	10	4	3	3	2	3
Fluoride	mg/L		1.5	0.12	<0.12[<B]	<0.12[<B]	<0.12[<B]	<0.12[<B]	<0.12[<B]	<0.12[<B]	<0.12[<B]
Sulphate	mg/L		500 AO	2	3	13	2	2	3	2	3
Alkalinity	mg/L			5	10	14	97	17	37	<5	74
True Color	TCU		15 AO	5	<5	<5	11	249	<5	7	<5
Turbidity	NTU		0.1-1	0.1	27.7	99.4	3.6	78.2	22.2	13.3	8.8
Electrical Conductivity	umho/cm			1	56	120	205	61	89	22	163
Nitrate + Nitrite as N	mg/L			0.05	1.50	0.15	<0.05	<0.05	<0.05	0.08	<0.05
Nitrate as N	mg/L		10	0.05	1.50[<B]	0.15[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	0.08[<B]	<0.05[<B]
Nitrite as N	mg/L		1.0	0.05	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Ammonia as N	mg/L			0.03	<0.03	0.04	0.05	0.11	0.03	0.04	0.04
Ortho-Phosphate as P	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L		200 AO	0.1	4.7	5.8	5.6	8.5	3.9	2.0	5.2
Dissolved Potassium	mg/L			0.1	1.7	1.5	1.8	0.6	0.6	0.4	1.3
Dissolved Calcium	mg/L			0.1	3.4	9.7	26.5	3.0	10.1	1.0	20.9
Dissolved Magnesium	mg/L			0.1	0.6	0.9	1.9	0.7	0.9	0.3	1.0
Bicarb. Alkalinity (as CaCO3)	mg/L			5	10	14	97	17	37	<5	74
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L			5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L		500 AO	1	28	50	101	36	44	8	79
Hardness	mg/L				11.0	27.9	74.0	10.4	28.9	3.7	56.3
Langelier Index (@20C)	NA				-3.37	-2.78	-0.20	-3.24	-1.43	-4.54	-0.67
Langelier Index (@ 4C)	NA				-3.69	-3.10	-0.52	-3.56	-1.75	-4.86	-0.99
Saturation pH (@ 20C)	NA				10.0	9.42	8.18	9.84	8.98	10.8	8.39
Saturation pH (@ 4C)	NA				10.3	9.74	8.50	10.2	9.30	11.1	8.71
Anion Sum	me/L				0.43	0.84	2.09	0.47	0.89	0.10	1.63
Cation sum	me/L				0.47	0.86	1.80	0.94	0.77	0.19	1.40
% Difference/ Ion Balance	%				5.0	1.2	7.6	33.6	7.3	29.5	7.5

Certified By: CoBrien

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Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

SAMPLE DESCRIPTION:					FMS-HG18-05B	FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255878	255879	255880	255881	255882	255883	255884
Dissolved Aluminum	ug/L	5	100 OG AO	5	14[>A]	8[>A]	<5[<A]	608[>A]	<5[<A]	117[>A]	<5[<A]
Dissolved Antimony	ug/L	20	6	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Arsenic	ug/L	5.0	10	2	5[A]	<2[<A]	13[>B]	20[>B]	<2[<A]	<2[<A]	<2[<A]
Dissolved Barium	ug/L	1000	1000	5	7[<A]	21[<A]	14[<A]	12[<A]	<5[<A]	6[<A]	13[<A]
Dissolved Beryllium	ug/L	5.3		2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Bismuth	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	1200	5000	5	<5[<A]	<5[<A]	9[<A]	6[<A]	<5[<A]	<5[<A]	6[<A]
Dissolved Cadmium	ug/L	0.01	5	0.017	0.034[A-B]	0.064[A-B]	<0.017[<B]	<0.017[<B]	<0.017[<B]	0.026[A-B]	<0.017[<B]
Dissolved Chromium	ug/L	-	50	1	<1[<B]	<1[<B]	1[<B]	2[<B]	<1[<B]	<1[<B]	1[<B]
Dissolved Cobalt	ug/L	10		1	2[<A]	6[<A]	<1[<A]	2[<A]	<1[<A]	<1[<A]	<1[<A]
Dissolved Copper	ug/L	2	1000 AO	1	5[>A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Iron	ug/L	300	300 AO	50	<50[<A]	<50[<A]	105[<A]	7230[>A]	<50[<A]	<50[<A]	<50[<A]
Dissolved Lead	ug/L	1	5	0.5	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]
Dissolved Manganese	ug/L	820	20 AO	2	47[<A]	288[<A]	568[<A]	331[<A]	5[<A]	61[<A]	323[<A]
Dissolved Molybdenum	ug/L	73		2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Nickel	ug/L	25		2	10[<A]	7[<A]	<2[<A]	3[<A]	<2[<A]	2[<A]	<2[<A]
Dissolved Phosphorus	mg/L			0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	1.0	50	1	<1[<A]	<1[<A]	<1[<A]	<1[<A]	<1[<A]	<1[<A]	<1[<A]
Dissolved Silver	ug/L	0.1		0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	0.2[>A]	<0.1[<A]
Dissolved Strontium	ug/L	21000	7000	5	16[<B]	38[<B]	155[<B]	14[<B]	39[<B]	7[<B]	83[<B]
Dissolved Thallium	ug/L	0.8		0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dissolved Tin	ug/L	-		2	<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L			2	<2	<2	<2	7	<2	<2	<2
Dissolved Uranium	ug/L	300	20	0.1	<0.1[<B]	<0.1[<B]	1.2[<B]	0.3[<B]	0.3[<B]	<0.1[<B]	0.5[<B]
Dissolved Vanadium	ug/L	6		2	<2[<A]	<2[<A]	<2[<A]	3[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Zinc	ug/L	30	5000 AO	5	12[<A]	8[<A]	<5[<A]	<5[<A]	<5[<A]	<5[<A]	<5[<A]

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

			SAMPLE DESCRIPTION:		FMS-HG18-09B	FMS-HG18-10A	FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B
			SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water
			DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255885	255886	255887	255888	255889	255890	255891
pH			7.0-10.5 OG		6.68	7.98	6.68	7.04	6.36	6.95	6.26
Reactive Silica as SiO2	mg/L			0.5	9.3	12.1	3.8	7.1	3.5	7.2	3.5
Chloride	mg/L		250 AO	1	3	3	3	3	6	3	2
Fluoride	mg/L		1.5	0.12	<0.12[<B]	<0.12[<B]	<0.12[<B]	<0.12[<B]	<0.12[<B]	<0.12[<B]	<0.12[<B]
Sulphate	mg/L		500 AO	2	<2	11	2	4	9	2	<2
Alkalinity	mg/L			5	17	71	6	43	28	10	<5
True Color	TCU		15 AO	5	<5	<5	<5	7	7	<5	<5
Turbidity	NTU		0.1-1	0.1	8.2	12.5	2.1	12.6	28.2	2.0	11.7
Electrical Conductivity	umho/cm			1	56	179	34	115	116	42	24
Nitrate + Nitrite as N	mg/L			0.05	<0.05	<0.05	0.10	0.31	0.43	0.12	0.06
Nitrate as N	mg/L		10	0.05	<0.05[<B]	<0.05[<B]	0.10[<B]	0.31[<B]	0.43[<B]	0.12[<B]	0.06[<B]
Nitrite as N	mg/L		1.0	0.05	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Ammonia as N	mg/L			0.03	0.03	<0.03	0.04	<0.03	<0.03	<0.03	<0.03
Ortho-Phosphate as P	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L		200 AO	0.1	4.8	6.2	2.4	4.8	3.3	3.5	2.3
Dissolved Potassium	mg/L			0.1	1.0	1.0	0.2	0.8	0.3	0.5	0.4
Dissolved Calcium	mg/L			0.1	4.7	23.9	2.7	10.4	3.1	3.9	1.3
Dissolved Magnesium	mg/L			0.1	0.8	1.7	0.4	1.3	1.3	0.6	0.5
Bicarb. Alkalinity (as CaCO3)	mg/L			5	17	71	6	43	28	10	<5
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L			5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L		500 AO	1	26	90	15	54	63	20	7
Hardness	mg/L				15.0	66.7	8.4	31.3	13.1	12.2	5.3
Langelier Index (@20C)	NA				-2.95	-0.37	-3.61	-1.87	-3.27	-2.98	-4.42
Langelier Index (@ 4C)	NA				-3.27	-0.69	-3.93	-2.19	-3.59	-3.30	-4.74
Saturation pH (@ 20C)	NA				9.63	8.35	10.3	8.91	9.63	9.93	10.7
Saturation pH (@ 4C)	NA				9.95	8.67	10.6	9.23	9.95	10.2	11.0
Anion Sum	me/L				0.42	1.73	0.25	1.05	0.95	0.33	0.06
Cation sum	me/L				0.58	1.63	0.29	0.95	1.19	0.41	0.23
% Difference/ Ion Balance	%				15.1	2.9	6.3	5.0	11.5	10.0	58.9

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Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

SAMPLE DESCRIPTION:					FMS-HG18-09B	FMS-HG18-10A	FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255885	255886	255887	255888	255889	255890	255891
Dissolved Aluminum	ug/L	5	100 OG AO	5	6[>A]	9[>A]	63[>A]	<5[<A]	140[>A]	<5[<A]	152[>A]
Dissolved Antimony	ug/L	20	6	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Arsenic	ug/L	5.0	10	2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Barium	ug/L	1000	1000	5	11[<A]	6[<A]	<5[<A]	<5[<A]	11[<A]	<5[<A]	8[<A]
Dissolved Beryllium	ug/L	5.3		2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Bismuth	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	1200	5000	5	<5[<A]	17[<A]	<5[<A]	<5[<A]	<5[<A]	<5[<A]	<5[<A]
Dissolved Cadmium	ug/L	0.01	5	0.017	0.042[A-B]	<0.017[<B]	<0.017[<B]	0.074[A-B]	0.161[A-B]	<0.017[<B]	<0.017[<B]
Dissolved Chromium	ug/L	-	50	1	1[<B]	<1[<B]	<1[<B]	1[<B]	4[<B]	<1[<B]	<1[<B]
Dissolved Cobalt	ug/L	10		1	2[<A]	<1[<A]	<1[<A]	<1[<A]	28[>A]	<1[<A]	<1[<A]
Dissolved Copper	ug/L	2	1000 AO	1	21[>A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Iron	ug/L	300	300 AO	50	676[>A]	<50[<A]	<50[<A]	<50[<A]	2450[>A]	<50[<A]	<50[<A]
Dissolved Lead	ug/L	1	5	0.5	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]
Dissolved Manganese	ug/L	820	20 AO	2	350[<A]	111[<A]	9[<A]	2590[>A]	18600[>A]	4[<A]	36[<A]
Dissolved Molybdenum	ug/L	73		2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Nickel	ug/L	25		2	6[<A]	<2[<A]	<2[<A]	4[<A]	4[<A]	<2[<A]	<2[<A]
Dissolved Phosphorus	mg/L			0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	1.0	50	1	<1[<A]	<1[<A]	<1[<A]	<1[<A]	2[A-B]	<1[<A]	<1[<A]
Dissolved Silver	ug/L	0.1		0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	0.5[>A]
Dissolved Strontium	ug/L	21000	7000	5	38[<B]	94[<B]	9[<B]	58[<B]	16[<B]	28[<B]	14[<B]
Dissolved Thallium	ug/L	0.8		0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dissolved Tin	ug/L	-		2	<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Uranium	ug/L	300	20	0.1	<0.1[<B]	0.5[<B]	<0.1[<B]	0.3[<B]	<0.1[<B]	<0.1[<B]	<0.1[<B]
Dissolved Vanadium	ug/L	6		2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Zinc	ug/L	30	5000 AO	5	9[<A]	<5[<A]	<5[<A]	<5[<A]	<5[<A]	<5[<A]	<5[<A]

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AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

			SAMPLE DESCRIPTION:		FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15A	FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A
			SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water
			DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255892	255893	255894	255895	255896	255897	255898
pH			7.0-10.5 OG		7.40	6.30	7.99	7.81	7.93	6.45	6.75
Reactive Silica as SiO2	mg/L			0.5	7.3	4.0	9.3	8.7	16.0	4.2	11.0
Chloride	mg/L		250 AO	1	6	5	3	2	3	3	3
Fluoride	mg/L		1.5	0.12	<0.12[<B]	<0.12[<B]	<0.12[<B]	<0.12[<B]	<0.12[<B]	<0.12[<B]	<0.12[<B]
Sulphate	mg/L		500 AO	2	7	3	10	7	8	2	<2
Alkalinity	mg/L			5	60	7	78	56	57	<5	17
True Color	TCU		15 AO	5	5	<5	<5	6	7	8	14
Turbidity	NTU		0.1-1	0.1	20.2	1.0	3.1	10.2	11.6	12.6	8.4
Electrical Conductivity	umho/cm			1	167	54	189	140	147	34	56
Nitrate + Nitrite as N	mg/L			0.05	0.21	0.30	<0.05	<0.05	<0.05	0.07	<0.05
Nitrate as N	mg/L		10	0.05	0.21[<B]	0.30[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	0.07[<B]	<0.05[<B]
Nitrite as N	mg/L		1.0	0.05	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Ammonia as N	mg/L			0.03	<0.03	0.04	<0.03	0.04	<0.03	0.04	<0.03
Ortho-Phosphate as P	mg/L			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L		200 AO	0.1	7.5	3.6	6.8	4.3	5.4	3.2	4.2
Dissolved Potassium	mg/L			0.1	1.1	0.5	1.1	0.9	1.4	0.6	0.9
Dissolved Calcium	mg/L			0.1	23.3	3.0	24.4	16.1	15.8	1.3	4.3
Dissolved Magnesium	mg/L			0.1	1.1	0.6	1.9	1.0	1.9	0.5	0.7
Bicarb. Alkalinity (as CaCO3)	mg/L			5	60	7	78	56	57	<5	17
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L			5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L		500 AO	1	83	21	94	65	70	11	24
Hardness	mg/L				62.7	10.0	68.8	44.3	47.3	5.3	13.6
Langelier Index (@20C)	NA				-1.03	-3.90	-0.32	-0.80	-0.69	-4.24	-2.91
Langelier Index (@ 4C)	NA				-1.35	-4.22	-0.64	-1.12	-1.01	-4.56	-3.23
Saturation pH (@ 20C)	NA				8.43	10.2	8.31	8.61	8.62	10.7	9.66
Saturation pH (@ 4C)	NA				8.75	10.5	8.63	8.93	8.94	11.0	9.98
Anion Sum	me/L				1.53	0.36	1.85	1.32	1.39	0.13	0.42
Cation sum	me/L				1.61	0.39	1.70	1.11	1.22	0.29	0.52
% Difference/ Ion Balance	%				2.6	2.7	4.2	8.6	6.5	37.9	9.8

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
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Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

SAMPLE DESCRIPTION:					FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15A	FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A
SAMPLE TYPE:					Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:					2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255892	255893	255894	255895	255896	255897	255898
Dissolved Aluminum	ug/L	5	100 OG AO	5	6[>A]	110[>A]	<5[<A]	<5[<A]	<5[<A]	214[>A]	7[>A]
Dissolved Antimony	ug/L	20	6	2	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]	<2[<B]
Dissolved Arsenic	ug/L	5.0	10	2	3[<A]	<2[<A]	8[A-B]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Barium	ug/L	1000	1000	5	7[<A]	11[<A]	<5[<A]	8[<A]	<5[<A]	12[<A]	9[<A]
Dissolved Beryllium	ug/L	5.3		2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Bismuth	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	1200	5000	5	<5[<A]	<5[<A]	6[<A]	<5[<A]	7[<A]	<5[<A]	<5[<A]
Dissolved Cadmium	ug/L	0.01	5	0.017	<0.017[<B]	0.050[A-B]	<0.017[<B]	<0.017[<B]	<0.017[<B]	0.021[A-B]	0.038[A-B]
Dissolved Chromium	ug/L	-	50	1	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]	<1[<B]
Dissolved Cobalt	ug/L	10		1	<1[<A]	<1[<A]	<1[<A]	<1[<A]	<1[<A]	1[<A]	1[<A]
Dissolved Copper	ug/L	2	1000 AO	1	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	15[>A]	14[>A]
Dissolved Iron	ug/L	300	300 AO	50	<50[<A]	<50[<A]	<50[<A]	<50[<A]	<50[<A]	<50[<A]	741[>A]
Dissolved Lead	ug/L	1	5	0.5	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]
Dissolved Manganese	ug/L	820	20 AO	2	7[<A]	38[<A]	143[<A]	328[<A]	127[<A]	74[<A]	287[<A]
Dissolved Molybdenum	ug/L	73		2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Nickel	ug/L	25		2	<2[<A]	3[<A]	<2[<A]	3[<A]	<2[<A]	6[<A]	6[<A]
Dissolved Phosphorus	mg/L			0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	1.0	50	1	<1[<A]	<1[<A]	<1[<A]	<1[<A]	<1[<A]	<1[<A]	<1[<A]
Dissolved Silver	ug/L	0.1		0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	0.4[>A]	<0.1[<A]
Dissolved Strontium	ug/L	21000	7000	5	58[<B]	15[<B]	87[<B]	37[<B]	86[<B]	13[<B]	34[<B]
Dissolved Thallium	ug/L	0.8		0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dissolved Tin	ug/L	-		2	<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L			2	<2	<2	<2	<2	<2	<2	<2
Dissolved Uranium	ug/L	300	20	0.1	0.2[<B]	<0.1[<B]	1.0[<B]	0.1[<B]	0.2[<B]	<0.1[<B]	<0.1[<B]
Dissolved Vanadium	ug/L	6		2	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]	<2[<A]
Dissolved Zinc	ug/L	30	5000 AO	5	<5[<A]	<5[<A]	<5[<A]	<5[<A]	<5[<A]	19[<A]	8[<A]

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CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

			SAMPLE DESCRIPTION:		DUP-B	DUP-C
			SAMPLE TYPE:		Water	Water
			DATE SAMPLED:		2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL	255899	255900
pH			7.0-10.5 OG		6.55	6.08
Reactive Silica as SiO2	mg/L			0.5	3.9	3.5
Chloride	mg/L		250 AO	1	3	2
Fluoride	mg/L		1.5	0.12	<0.12[<B]	<0.12[<B]
Sulphate	mg/L		500 AO	2	<2	<2
Alkalinity	mg/L			5	6	<5
True Color	TCU		15 AO	5	<5	17
Turbidity	NTU		0.1-1	0.1	7.2	11.7
Electrical Conductivity	umho/cm			1	34	25
Nitrate + Nitrite as N	mg/L			0.05	0.09	0.05
Nitrate as N	mg/L		10	0.05	0.09[<B]	0.05[<B]
Nitrite as N	mg/L		1.0	0.05	<0.05[<B]	<0.05[<B]
Ammonia as N	mg/L			0.03	0.03	<0.03
Ortho-Phosphate as P	mg/L			0.01	<0.01	<0.01
Dissolved Sodium	mg/L		200 AO	0.1	2.3	1.9
Dissolved Potassium	mg/L			0.1	0.3	0.3
Dissolved Calcium	mg/L			0.1	2.9	1.0
Dissolved Magnesium	mg/L			0.1	0.4	0.4
Bicarb. Alkalinity (as CaCO3)	mg/L			5	6	<5
Carb. Alkalinity (as CaCO3)	mg/L			10	<10	<10
Hydroxide	mg/L			5	<5	<5
Calculated TDS	mg/L		500 AO	1	13	6
Hardness	mg/L				8.9	4.1
Langelier Index (@20C)	NA				-3.71	-4.71
Langelier Index (@ 4C)	NA				-4.03	-5.03
Saturation pH (@ 20C)	NA				10.3	10.8
Saturation pH (@ 4C)	NA				10.6	11.1
Anion Sum	me/L				0.21	0.06
Cation sum	me/L				0.30	0.19
% Difference/ Ion Balance	%				16.8	51.6

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Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

					SAMPLE DESCRIPTION:	DUP-B	DUP-C
					SAMPLE TYPE:	Water	Water
					DATE SAMPLED:	2019-06-05	2019-06-05
Parameter	Unit	G / S: A	G / S: B	RDL		255899	255900
Dissolved Aluminum	ug/L	5	100 OG AO	5		70[>A]	114[>A]
Dissolved Antimony	ug/L	20	6	2		<2[<B]	<2[<B]
Dissolved Arsenic	ug/L	5.0	10	2		<2[<A]	<2[<A]
Dissolved Barium	ug/L	1000	1000	5		<5[<A]	6[<A]
Dissolved Beryllium	ug/L	5.3		2		<2[<A]	<2[<A]
Dissolved Bismuth	ug/L			2		<2	<2
Dissolved Boron	ug/L	1200	5000	5		<5[<A]	<5[<A]
Dissolved Cadmium	ug/L	0.01	5	0.017		<0.017[<B]	<0.017[<B]
Dissolved Chromium	ug/L	-	50	1		<1[<B]	<1[<B]
Dissolved Cobalt	ug/L	10		1		<1[<A]	<1[<A]
Dissolved Copper	ug/L	2	1000 AO	1		<2[<A]	<2[<A]
Dissolved Iron	ug/L	300	300 AO	50		<50[<A]	<50[<A]
Dissolved Lead	ug/L	1	5	0.5		<0.5[<A]	<0.5[<A]
Dissolved Manganese	ug/L	820	20 AO	2		10[<A]	38[<A]
Dissolved Molybdenum	ug/L	73		2		<2[<A]	<2[<A]
Dissolved Nickel	ug/L	25		2		<2[<A]	<2[<A]
Dissolved Phosphorus	mg/L			0.02		<0.02	<0.02
Dissolved Selenium	ug/L	1.0	50	1		<1[<A]	<1[<A]
Dissolved Silver	ug/L	0.1		0.1		<0.1[<A]	0.4[>A]
Dissolved Strontium	ug/L	21000	7000	5		10[<B]	10[<B]
Dissolved Thallium	ug/L	0.8		0.1		<0.1[<A]	<0.1[<A]
Dissolved Tin	ug/L	-		2		<2	<2
Dissolved Titanium	ug/L			2		<2	<2
Dissolved Uranium	ug/L	300	20	0.1		<0.1[<B]	<0.1[<B]
Dissolved Vanadium	ug/L	6		2		<2[<A]	<2[<A]
Dissolved Zinc	ug/L	30	5000 AO	5		<5[<A]	<5[<A]

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Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

Comments:	RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2016, B Refers to Canadian Drinking Water Quality - updated 2019-05 Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.
255833-255872	Metals analysis completed on a filtered sample.
255873	Metals analysis completed on a filtered sample. Ion Balance is biased high, contributing parameters have been confirmed.
255874	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
255875	Metals analysis completed on a filtered sample. Ion Balance is biased high, contributing parameters have been confirmed.
255876-255880	Metals analysis completed on a filtered sample.
255881	Metals analysis completed on a filtered sample. Ion Balance is biased high, contributing parameters have been confirmed.
255882	Metals analysis completed on a filtered sample.
255883	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
255884	Metals analysis completed on a filtered sample.
255885	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
255886-255888	Metals analysis completed on a filtered sample.
255889	Metals analysis completed on a filtered sample. Ion Balance is biased high, contributing parameters have been confirmed.
255890	Metals analysis completed on a filtered sample.
255891	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
255892-255896	Metals analysis completed on a filtered sample.
255897	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
255898	Metals analysis completed on a filtered sample.
255899-255900	Metals analysis completed on a filtered sample. The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.

Analysis performed at AGAT Halifax (unless marked by *)

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AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

TSS

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

		SAMPLE DESCRIPTION:		FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A	FMS-HG18-05B
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255833	255872	255873	255874	255875	255876	255877	255878
Total Suspended Solids	mg/L		5	<5	18	14	72	10	10	6	84

		SAMPLE DESCRIPTION:		FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-10A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255879	255880	255881	255882	255883	255884	255885	255886
Total Suspended Solids	mg/L		5	45	14	83	62	57	14	13	18

		SAMPLE DESCRIPTION:		FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255887	255888	255889	255890	255891	255892	255893	255894
Total Suspended Solids	mg/L		5	19	34	8	<5	34	32	<5	<5

		SAMPLE DESCRIPTION:		FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A	DUP-B	DUP-C
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255895	255896	255897	255898	255899	255900
Total Suspended Solids	mg/L		5	20	24	40	12	16	34

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

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AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Total Phosphorus

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

		SAMPLE DESCRIPTION:		FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A	FMS-HG18-05B
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255833	255872	255873	255874	255875	255876	255877	255878
Total Phosphorous as P	mg/L		0.03	<0.03	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03

		SAMPLE DESCRIPTION:		FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-10A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255879	255880	255881	255882	255883	255884	255885	255886
Total Phosphorous as P	mg/L		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03

		SAMPLE DESCRIPTION:		FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255887	255888	255889	255890	255891	255892	255893	255894
Total Phosphorous as P	mg/L		0.03	0.09	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03

		SAMPLE DESCRIPTION:		FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A	DUP-B	DUP-C
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255895	255896	255897	255898	255899	255900
Total Phosphorous as P	mg/L		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: CoBrien

Results relate only to the items tested. Results apply to samples as received.

AGAT Laboratories
11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Various Inorganics (Water)

DATE RECEIVED: 2019-06-07

DATE REPORTED: 2019-06-27

		SAMPLE DESCRIPTION:		FMS-HG18-02A	FMS-HG18-02B	FMS-HG18-03A	FMS-HG18-03B	FMS-HG18-04A	FMS-HG18-04B	FMS-HG18-05A	FMS-HG18-05B
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255833	255872	255873	255874	255875	255876	255877	255878
Chemical Oxygen Demand	mg/L		3	<3	4	7	<3	<3	4	5	4
Dissolved Organic Carbon	mg/L		0.5	1.2	1.2	1.8	0.9	0.6	0.9	1.1	1.3

		SAMPLE DESCRIPTION:		FMS-HG18-06A	FMS-HG18-07A	FMS-HG18-07B	FMS-HG18-08A	FMS-HG18-08B	FMS-HG18-09A	FMS-HG18-09B	FMS-HG18-10A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255879	255880	255881	255882	255883	255884	255885	255886
Chemical Oxygen Demand	mg/L		3	4	7	58	<3	<3	<3	<3	<3
Dissolved Organic Carbon	mg/L		0.5	1.0	2.1	18.9	1.0	1.5	0.7	0.9	0.9

		SAMPLE DESCRIPTION:		FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-14A	FMS-HG18-14B	FMS-HG18-15A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255887	255888	255889	255890	255891	255892	255893	255894
Chemical Oxygen Demand	mg/L		3	<3	3	11	6	7	5	<3	6
Dissolved Organic Carbon	mg/L		0.5	0.9	1.0	4.0	1.0	1.1	0.6	0.9	0.8

		SAMPLE DESCRIPTION:		FMS-HG18-15B	FMS-HG18-16A	FMS-HG18-16B	DUP-A	DUP-B	DUP-C
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05	2019-06-05
Parameter	Unit	G / S	RDL	255895	255896	255897	255898	255899	255900
Chemical Oxygen Demand	mg/L		3	5	<3	7	5	4	4
Dissolved Organic Carbon	mg/L		0.5	0.9	0.9	1.3	0.9	0.9	1.0

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

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Guideline Violation

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
255833	FMS-HG18-02A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	12
255833	FMS-HG18-02A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	47
255833	FMS-HG18-02A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	3.2
255833	FMS-HG18-02A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	12
255833	FMS-HG18-02A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	15
255872	FMS-HG18-02B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	32
255872	FMS-HG18-02B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	9.4
255872	FMS-HG18-02B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	5.19
255872	FMS-HG18-02B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	77
255872	FMS-HG18-02B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	8
255873	FMS-HG18-03A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	316
255873	FMS-HG18-03A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	9.0
255873	FMS-HG18-03A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	14
255873	FMS-HG18-03A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	8
255874	FMS-HG18-03B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	42
255874	FMS-HG18-03B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	9.6
255874	FMS-HG18-03B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.57
255874	FMS-HG18-03B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Silver	ug/L	0.1	0.4
255875	FMS-HG18-04A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	33
255875	FMS-HG18-04A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	242
255875	FMS-HG18-04A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	3.1
255875	FMS-HG18-04A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	6
255875	FMS-HG18-04A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	33
255876	FMS-HG18-04B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	463
255876	FMS-HG18-04B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	10.9
255876	FMS-HG18-04B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.70
255876	FMS-HG18-04B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.043
255876	FMS-HG18-04B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Zinc	ug/L	30	268
255877	FMS-HG18-05A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	12
255877	FMS-HG18-05A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	1.9
255877	FMS-HG18-05A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.72
255877	FMS-HG18-05A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	12
255878	FMS-HG18-05B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	47
255878	FMS-HG18-05B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	27.7
255878	FMS-HG18-05B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.63
255878	FMS-HG18-05B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	14
255878	FMS-HG18-05B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.034
255878	FMS-HG18-05B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	5
255879	FMS-HG18-06A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	288
255879	FMS-HG18-06A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	99.4
255879	FMS-HG18-06A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.64
255879	FMS-HG18-06A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	8
255879	FMS-HG18-06A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.064

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Guideline Violation

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
255880	FMS-HG18-07A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	13
255880	FMS-HG18-07A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	568
255880	FMS-HG18-07A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	3.6
255880	FMS-HG18-07A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	13
255881	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	100 OG AO	608
255881	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	10	20
255881	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300 AO	7230
255881	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	331
255881	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	True Color	TCU	15 AO	249
255881	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	78.2
255881	FMS-HG18-07B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.60
255881	FMS-HG18-07B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	608
255881	FMS-HG18-07B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	20
255881	FMS-HG18-07B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300	7230
255882	FMS-HG18-08A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	22.2
255883	FMS-HG18-08B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	100 OG AO	117
255883	FMS-HG18-08B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	61
255883	FMS-HG18-08B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	13.3
255883	FMS-HG18-08B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.25
255883	FMS-HG18-08B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	117
255883	FMS-HG18-08B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.026
255883	FMS-HG18-08B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Silver	ug/L	0.1	0.2
255884	FMS-HG18-09A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	323
255884	FMS-HG18-09A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	8.8
255885	FMS-HG18-09B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300 AO	676
255885	FMS-HG18-09B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	350
255885	FMS-HG18-09B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	8.2
255885	FMS-HG18-09B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.68
255885	FMS-HG18-09B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	6
255885	FMS-HG18-09B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.042
255885	FMS-HG18-09B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	21
255885	FMS-HG18-09B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300	676
255886	FMS-HG18-10A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	111
255886	FMS-HG18-10A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	12.5
255886	FMS-HG18-10A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	9
255887	FMS-HG18-10B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	2.1
255887	FMS-HG18-10B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.68
255887	FMS-HG18-10B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	63
255888	FMS-HG18-11A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	2590
255888	FMS-HG18-11A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	12.6
255888	FMS-HG18-11A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.074
255888	FMS-HG18-11A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	820	2590
255889	FMS-HG18-11B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	100 OG AO	140

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Guideline Violation

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
255889	FMS-HG18-11B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300 AO	2450
255889	FMS-HG18-11B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	18600
255889	FMS-HG18-11B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	28.2
255889	FMS-HG18-11B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.36
255889	FMS-HG18-11B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	140
255889	FMS-HG18-11B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.161
255889	FMS-HG18-11B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Cobalt	ug/L	10	28
255889	FMS-HG18-11B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300	2450
255889	FMS-HG18-11B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	820	18600
255889	FMS-HG18-11B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Selenium	ug/L	1.0	2
255890	FMS-HG18-13A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	2.0
255890	FMS-HG18-13A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.95
255891	FMS-HG18-13B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	100 OG AO	152
255891	FMS-HG18-13B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	36
255891	FMS-HG18-13B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	11.7
255891	FMS-HG18-13B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.26
255891	FMS-HG18-13B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	152
255891	FMS-HG18-13B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Silver	ug/L	0.1	0.5
255892	FMS-HG18-14A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	20.2
255892	FMS-HG18-14A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	6
255893	FMS-HG18-14B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	100 OG AO	110
255893	FMS-HG18-14B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	38
255893	FMS-HG18-14B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.30
255893	FMS-HG18-14B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	110
255893	FMS-HG18-14B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.050
255894	FMS-HG18-15A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	143
255894	FMS-HG18-15A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	3.1
255894	FMS-HG18-15A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Arsenic	ug/L	5.0	8
255895	FMS-HG18-15B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	328
255895	FMS-HG18-15B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	10.2
255896	FMS-HG18-16A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	127
255896	FMS-HG18-16A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	11.6
255897	FMS-HG18-16B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	100 OG AO	214
255897	FMS-HG18-16B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	74
255897	FMS-HG18-16B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	12.6
255897	FMS-HG18-16B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.45
255897	FMS-HG18-16B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	214
255897	FMS-HG18-16B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.021
255897	FMS-HG18-16B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	15
255897	FMS-HG18-16B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Silver	ug/L	0.1	0.4
255898	DUP-A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300 AO	741
255898	DUP-A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	287
255898	DUP-A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	8.4

Results relate only to the items tested. Results apply to samples as received.

AGAT Laboratories

Guideline Violation

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Sheri Burton

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
255898	DUP-A	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.75
255898	DUP-A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	7
255898	DUP-A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.01	0.038
255898	DUP-A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	2	14
255898	DUP-A	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	300	741
255899	DUP-B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	7.2
255899	DUP-B	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.55
255899	DUP-B	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	70
255900	DUP-C	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	100 OG AO	114
255900	DUP-C	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	20 AO	38
255900	DUP-C	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	True Color	TCU	15 AO	17
255900	DUP-C	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	Turbidity	NTU	0.1-1	11.7
255900	DUP-C	NS-CDWQ incl [AO]	Standard Water Analysis + Dissolved Metals	pH		7.0-10.5 OG	6.08
255900	DUP-C	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	5	114
255900	DUP-C	NS-ContSiteSW_FW_G	Standard Water Analysis + Dissolved Metals	Dissolved Silver	ug/L	0.1	0.4

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date: Jun 27, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
Benzene	1	252089	< 0.001	< 0.001	NA	< 0.001	81%	70%	130%	78%	70%	130%			
Toluene	1	252089	< 0.001	< 0.001	NA	< 0.001	82%	70%	130%	83%	70%	130%			
Ethylbenzene	1	252089	< 0.001	< 0.001	NA	< 0.001	78%	70%	130%	81%	70%	130%			
Xylene (Total)	1	252089	< 0.002	< 0.002	NA	< 0.002	81%	70%	130%	83%	70%	130%			
C6-C10 (less BTEX)	1	252089	0.02	0.02	NA	< 0.01	73%	70%	130%	91%	70%	130%	103%	70%	130%
>C10-C16 Hydrocarbons	1	TW	1.82	1.98	8.0%	< 0.05	90%	70%	130%	94%	70%	130%	88%	70%	130%
>C16-C21 Hydrocarbons	1	TW	6.26	7.21	14.0%	< 0.10	93%	70%	130%	94%	70%	130%	88%	70%	130%
>C21-C32 Hydrocarbons	1	TW	3.38	3.82	12.0%	< 0.1	74%	70%	130%	94%	70%	130%	88%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. VPH matrix spike performed on a different sample than the duplicate.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
Benzene	1	255876	< 0.001	< 0.001	NA	< 0.001	72%	70%	130%	70%	70%	130%			
Toluene	1	255876	< 0.001	< 0.001	NA	< 0.001	73%	70%	130%	74%	70%	130%			
Ethylbenzene	1	255876	< 0.001	< 0.001	NA	< 0.001	72%	70%	130%	74%	70%	130%			
Xylene (Total)	1	255876	< 0.002	< 0.002	NA	< 0.002	76%	70%	130%	77%	70%	130%			
C6-C10 (less BTEX)	1	255876	< 0.01	< 0.01	NA	< 0.01	79%	70%	130%	89%	70%	130%	98%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. VPH matrix spike performed on a different sample than the duplicate.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
>C10-C16 Hydrocarbons	1	TW	1.50	1.74	14.8%	< 0.05	106%	70%	130%	80%	70%	130%	87%	70%	130%
>C16-C21 Hydrocarbons	1	TW	5.46	5.94	8.4%	< 0.10	108%	70%	130%	80%	70%	130%	87%	70%	130%
>C21-C32 Hydrocarbons	1	TW	2.79	3.25	15.2%	< 0.1	86%	70%	130%	80%	70%	130%	87%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. VPH matrix spike performed on a different sample than the duplicate.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
Benzene	1	255896	< 0.001	< 0.001	NA	< 0.001	99%	70%	130%	79%	70%	130%			
Toluene	1	255896	< 0.001	< 0.001	NA	< 0.001	103%	70%	130%	87%	70%	130%			
Ethylbenzene	1	255896	< 0.001	< 0.001	NA	< 0.001	97%	70%	130%	89%	70%	130%			
Xylene (Total)	1	255896	< 0.002	< 0.002	NA	< 0.002	100%	70%	130%	92%	70%	130%			
C6-C10 (less BTEX)	1	255896	< 0.01	< 0.01	NA	< 0.01	102%	70%	130%	115%	70%	130%	NA	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. VPH matrix spike performed on a different sample than the duplicate.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Certified By:

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Jun 27, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES
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PROJECT: 1895674
ATTENTION TO: Sheri Burton
SAMPLING SITE:
SAMPLED BY:

Water Analysis

RPT Date: Jun 27, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Standard Water Analysis + Dissolved Metals															
pH	267826		7.64	7.65	0.1%	<	101%	80%	120%	NA	80%	120%	NA	80%	120%
Reactive Silica as SiO2	254474		5.6	5.5	3.3%	< 0.5	107%	80%	120%	104%	80%	120%	106%	80%	120%
Chloride	254668		13	13	0.7%	< 1	97%	80%	120%	NA	80%	120%	NA	80%	120%
Fluoride	254668		<0.12	<0.12	NA	< 0.12	109%	80%	120%	NA	80%	120%	101%	80%	120%
Sulphate	254668		<2	<2	NA	< 2	109%	80%	120%	NA	80%	120%	96%	80%	120%
Alkalinity	267826		67	67	0.4%	< 5	94%	80%	120%	NA	80%	120%	NA	80%	120%
True Color	267826		6	<5	NA	< 5	90%	80%	120%	NA			NA		
Turbidity	255887	255887	2.1	2.5	19.0%	< 0.1	100%	80%	120%	NA			NA		
Electrical Conductivity	267826		168	170	1.1%	< 1	110%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrate as N	254668		3.34	3.34	0.0%	< 0.05	96%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrite as N	254668		0.12	0.14	NA	< 0.05	102%	80%	120%	NA	80%	120%	106%	80%	120%
Ammonia as N	254439		<0.03	<0.03	NA	< 0.03	103%	80%	120%	104%	80%	120%	97%	80%	120%
Ortho-Phosphate as P	254474		<0.01	<0.01	NA	< 0.01	97%	80%	120%	104%	80%	120%	103%	80%	120%
Dissolved Sodium	255900	255900	1.9	2.0	6.0%	< 0.1	85%	80%	120%	105%	80%	120%	NA	70%	130%
Dissolved Potassium	255900	255900	0.3	0.3	NA	< 0.1	84%	80%	120%	98%	80%	120%	90%	70%	130%
Dissolved Calcium	255900	255900	1.0	1.1	10.0%	< 0.1	90%	80%	120%	97%	80%	120%	101%	70%	130%
Dissolved Magnesium	255900	255900	0.4	0.4	NA	< 0.1	90%	80%	120%	105%	80%	120%	99%	70%	130%
Bicarb. Alkalinity (as CaCO3)	267826		67	67	0.4%	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	267826		<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	267826		<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Dissolved Aluminum	255900	255900	114	121	5.3%	< 5	89%	80%	120%	105%	80%	120%	NA	70%	130%
Dissolved Antimony	255900	255900	<2	<2	NA	< 2	97%	80%	120%	NA	80%	120%	104%	70%	130%
Dissolved Arsenic	255900	255900	<2	<2	NA	< 2	81%	80%	120%	96%	80%	120%	92%	70%	130%
Dissolved Barium	255900	255900	6	7	NA	< 5	84%	80%	120%	97%	80%	120%	99%	70%	130%
Dissolved Beryllium	255900	255900	<2	<2	NA	< 2	81%	80%	120%	95%	80%	120%	96%	70%	130%
Dissolved Bismuth	255900	255900	<2	<2	NA	< 2	84%	80%	120%	104%	80%	120%	80%	70%	130%
Dissolved Boron	255900	255900	<5	<5	NA	< 5	86%	80%	120%	97%	80%	120%	92%	70%	130%
Dissolved Cadmium	255900	255900	<0.017	<0.017	NA	< 0.09	NA	80%	120%	96%	80%	120%	89%	70%	130%
Dissolved Chromium	255900	255900	<1	<1	NA	< 1	NA	80%	120%	98%	80%	120%	89%	70%	130%
Dissolved Cobalt	255900	255900	<1	<1	NA	< 1	NA	80%	120%	98%	80%	120%	90%	70%	130%
Dissolved Copper	255900	255900	<2	<2	NA	< 2	81%	80%	120%	102%	80%	120%	92%	70%	130%
Dissolved Iron	255900	255900	<50	<50	NA	< 50	NA	80%	120%	98%	80%	120%	79%	70%	130%
Dissolved Lead	255900	255900	<0.5	<0.5	NA	< 0.5	82%	80%	120%	100%	80%	120%	95%	70%	130%
Dissolved Manganese	255900	255900	38	30	22.4%	< 2	NA	80%	120%	99%	80%	120%	NA	70%	130%
Dissolved Molybdenum	255900	255900	<2	<2	NA	< 2	NA	80%	120%	96%	80%	120%	80%	70%	130%
Dissolved Nickel	255900	255900	<2	<2	NA	< 2	80%	80%	120%	100%	80%	120%	101%	70%	130%
Dissolved Phosphorus	255900	255900	<0.02	<0.02	NA	< 0.02	82%	80%	120%	93%	80%	120%	76%	70%	130%
Dissolved Selenium	255900	255900	<1	<1	NA	< 1	NA	80%	120%	98%	80%	120%	96%	70%	130%
Dissolved Silver	255900	255900	0.4	0.4	NA	< 0.1	NA	80%	120%	97%	80%	120%	85%	70%	130%

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES
AGAT WORK ORDER: 19X477047
PROJECT: 1895674
ATTENTION TO: Sheri Burton
SAMPLING SITE:
SAMPLED BY:

Water Analysis (Continued)

RPT Date: Jun 27, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Dissolved Strontium	255900	255900	10	11	NA	< 5	NA	80%	120%	95%	80%	120%	93%	70%	130%
Dissolved Thallium	255900	255900	<0.1	<0.1	NA	< 0.1	82%	80%	120%	99%	80%	120%	93%	70%	130%
Dissolved Tin	255900	255900	<2	<2	NA	< 2	NA	80%	120%	99%	80%	120%	83%	70%	130%
Dissolved Titanium	255900	255900	<2	<2	NA	< 2	86%	80%	120%	99%	80%	120%	86%	70%	130%
Dissolved Uranium	255900	255900	<0.1	<0.1	NA	< 0.1	80%	80%	120%	95%	80%	120%	89%	70%	130%
Dissolved Vanadium	255900	255900	<2	<2	NA	< 2	NA	80%	120%	91%	80%	120%	87%	70%	130%
Dissolved Zinc	255900	255900	<5	<5	NA	< 5	81%	80%	120%	98%	80%	120%	92%	70%	130%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Mercury Analysis in Water (Dissolved)															
Dissolved Mercury	255882	255882	<0.026	<0.026	NA	< 0.026	108%	80%	120%	NA	80%	120%	99%	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Mercury Analysis in Water (Total)															
Total Mercury	255892		NA	NA	NA	< 0.026	108%	80%	120%	NA	80%	120%	95%	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
TSS															
Total Suspended Solids	255698		<5	<5	NA	< 5	101%	80%	120%	NA			112%	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Standard Water Analysis + Dissolved Metals															
pH	255876	255876	6.70	6.63	1.1%	<	101%	80%	120%	NA	80%	120%	NA	80%	120%
Reactive Silica as SiO2	255878	255878	6.2	6.9	9.7%	< 0.5	107%	80%	120%	106%	80%	120%	112%	80%	120%
Alkalinity	255876	255876	11	10	NA	< 5	94%	80%	120%	NA	80%	120%	NA	80%	120%
Electrical Conductivity	255876	255876	46	45	1.8%	< 1	103%	80%	120%	NA	80%	120%	NA	80%	120%
Ammonia as N	255872	255872	0.04	<0.03	NA	< 0.03	102%	80%	120%	103%	80%	120%	98%	80%	120%
Ortho-Phosphate as P	255878	255878	<0.01	<0.01	NA	< 0.01	101%	80%	120%	109%	80%	120%	106%	80%	120%
Dissolved Sodium	255899	255899	2.3	2.8	18.0%	< 0.1	107%	80%	120%	106%	80%	120%	NA	70%	130%
Dissolved Potassium	255899	255899	0.3	0.3	NA	< 0.1	104%	80%	120%	108%	80%	120%	104%	70%	130%
Dissolved Calcium	255899	255899	2.9	3.5	16.2%	< 0.1	101%	80%	120%	98%	80%	120%	NA	70%	130%
Dissolved Magnesium	255899	255899	0.4	0.5	NA	< 0.1	101%	80%	120%	107%	80%	120%	112%	70%	130%
Bicarb. Alkalinity (as CaCO3)	255876	255876	11	10	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	255876	255876	<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	255876	255876	<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Dissolved Aluminum	255899	255899	70	85	18.3%	< 5	106%	80%	120%	110%	80%	120%	114%	70%	130%
Dissolved Antimony	255899	255899	<2	<2	NA	< 2	82%	80%	120%	NA	80%	120%	118%	70%	130%
Dissolved Arsenic	255899	255899	<2	<2	NA	< 2	98%	80%	120%	95%	80%	120%	105%	70%	130%
Dissolved Barium	255899	255899	<5	<5	NA	< 5	101%	80%	120%	95%	80%	120%	99%	70%	130%
Dissolved Beryllium	255899	255899	<2	<2	NA	< 2	98%	80%	120%	97%	80%	120%	110%	70%	130%

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Quality Assurance

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AGAT WORK ORDER: 19X477047
PROJECT: 1895674
ATTENTION TO: Sheri Burton
SAMPLING SITE:
SAMPLED BY:

Water Analysis (Continued)

RPT Date: Jun 27, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Dissolved Bismuth	255899	255899	<2	<2	NA	< 2	97%	80%	120%	98%	80%	120%	NA	70%	130%
Dissolved Boron	255899	255899	<5	<5	NA	< 5	101%	80%	120%	96%	80%	120%	110%	70%	130%
Dissolved Cadmium	255899	255899	<0.09	<0.09	NA	< 0.09	99%	80%	120%	102%	80%	120%	106%	70%	130%
Dissolved Chromium	255899	255899	<1	<1	NA	< 1	97%	80%	120%	101%	80%	120%	102%	70%	130%
Dissolved Cobalt	255899	255899	<1	<1	NA	< 1	99%	80%	120%	98%	80%	120%	106%	70%	130%
Dissolved Copper	255899	255899	<2	<2	NA	< 2	100%	80%	120%	104%	80%	120%	106%	70%	130%
Dissolved Iron	255899	255899	<50	<50	NA	< 50	98%	80%	120%	97%	80%	120%	96%	70%	130%
Dissolved Lead	255899	255899	<0.5	<0.5	NA	< 0.5	101%	80%	120%	97%	80%	120%	99%	70%	130%
Dissolved Manganese	255899	255899	10	11	10.0%	< 2	99%	80%	120%	99%	80%	120%	108%	70%	130%
Dissolved Molybdenum	255899	255899	<2	<2	NA	< 2	97%	80%	120%	97%	80%	120%	97%	70%	130%
Dissolved Nickel	255899	255899	<2	<2	NA	< 2	101%	80%	120%	102%	80%	120%	NA	70%	130%
Dissolved Phosphorus	255899	255899	<0.02	<0.02	NA	< 0.02	101%	80%	120%	102%	80%	120%	97%	70%	130%
Dissolved Selenium	255899	255899	<1	<1	NA	< 1	102%	80%	120%	100%	80%	120%	118%	70%	130%
Dissolved Silver	255899	255899	<0.1	<0.1	NA	< 0.1	97%	80%	120%	98%	80%	120%	99%	70%	130%
Dissolved Strontium	255899	255899	10	11	NA	< 5	98%	80%	120%	102%	80%	120%	105%	70%	130%
Dissolved Thallium	255899	255899	<0.1	<0.1	NA	< 0.1	101%	80%	120%	101%	80%	120%	100%	70%	130%
Dissolved Tin	255899	255899	<2	<2	NA	< 2	95%	80%	120%	100%	80%	120%	95%	70%	130%
Dissolved Titanium	255899	255899	<2	<2	NA	< 2	100%	80%	120%	107%	80%	120%	107%	70%	130%
Dissolved Uranium	255899	255899	<0.1	<0.1	NA	< 0.1	98%	80%	120%	94%	80%	120%	93%	70%	130%
Dissolved Vanadium	255899	255899	<2	<2	NA	< 2	96%	80%	120%	94%	80%	120%	102%	70%	130%
Dissolved Zinc	255899	255899	<5	<5	NA	< 5	97%	80%	120%	102%	80%	120%	105%	70%	130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Standard Water Analysis + Dissolved Metals

pH	255896	255896	7.93	7.93	0%	<	101%	80%	120%	NA	80%	120%	NA	80%	120%
Reactive Silica as SiO2	255898	255898	11.0	10.9	0.5%	< 0.5	112%	80%	120%	99%	80%	120%	109%	80%	120%
Alkalinity	255896	255896	57	56	0.7%	< 5	95%	80%	120%	NA	80%	120%	NA	80%	120%
Electrical Conductivity	255896	255896	147	146	0.4%	< 1	106%	80%	120%	NA	80%	120%	NA	80%	120%
Ammonia as N	255892	255892	<0.03	<0.03	NA	< 0.03	101%	80%	120%	101%	80%	120%	95%	80%	120%
Ortho-Phosphate as P	255898	255898	<0.01	<0.01	NA	< 0.01	100%	80%	120%	108%	80%	120%	105%	80%	120%
Bicarb. Alkalinity (as CaCO3)	255896	255896	57	56	0.7%	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	255896	255896	<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	255896	255896	<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Standard Water Analysis + Dissolved Metals

Dissolved Sodium	255899	255899	2.3	2.8	18.0%	< 0.1	97%	80%	120%	105%	80%	120%	NA	70%	130%
Dissolved Potassium	255899	255899	0.3	0.3	NA	< 0.1	107%	80%	120%	115%	80%	120%	104%	70%	130%
Dissolved Calcium	255899	255899	2.9	3.5	16.2%	< 0.1	102%	80%	120%	111%	80%	120%	NA	70%	130%
Dissolved Magnesium	255899	255899	0.4	0.5	NA	< 0.1	101%	80%	120%	107%	80%	120%	112%	70%	130%

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CANADA B3B 1M2
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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES
AGAT WORK ORDER: 19X477047
PROJECT: 1895674
ATTENTION TO: Sheri Burton
SAMPLING SITE:
SAMPLED BY:

Water Analysis (Continued)

RPT Date: Jun 27, 2019

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Dissolved Aluminum	255899	255899	70	85	18.3%	< 5	110%	80%	120%	120%	80%	120%	114%	70%	130%
Dissolved Antimony	255899	255899	<2	<2	NA	< 2	80%	80%	120%	120%	80%	120%	118%	70%	130%
Dissolved Arsenic	255899	255899	<2	<2	NA	< 2	100%	80%	120%	105%	80%	120%	105%	70%	130%
Dissolved Barium	255899	255899	<5	<5	NA	< 5	93%	80%	120%	95%	80%	120%	99%	70%	130%
Dissolved Beryllium	255899	255899	<2	<2	NA	< 2	104%	80%	120%	104%	80%	120%	110%	70%	130%
Dissolved Bismuth	255899	255899	<2	<2	NA	< 2	90%	80%	120%	100%	80%	120%	NA	70%	130%
Dissolved Boron	255899	255899	<5	<5	NA	< 5	99%	80%	120%	114%	80%	120%	110%	70%	130%
Dissolved Cadmium	255899	255899	<0.09	<0.09	NA	< 0.09	95%	80%	120%	105%	80%	120%	106%	70%	130%
Dissolved Chromium	255899	255899	<1	<1	NA	< 1	96%	80%	120%	101%	80%	120%	102%	70%	130%
Dissolved Cobalt	255899	255899	<1	<1	NA	< 1	98%	80%	120%	103%	80%	120%	106%	70%	130%
Dissolved Copper	255899	255899	<2	<2	NA	< 2	99%	80%	120%	105%	80%	120%	106%	70%	130%
Dissolved Iron	255899	255899	<50	<50	NA	< 50	98%	80%	120%	104%	80%	120%	96%	70%	130%
Dissolved Lead	255899	255899	<0.5	<0.5	NA	< 0.5	95%	80%	120%	102%	80%	120%	99%	70%	130%
Dissolved Manganese	255899	255899	10	11	10.0%	< 2	98%	80%	120%	102%	80%	120%	108%	70%	130%
Dissolved Molybdenum	255899	255899	<2	<2	NA	< 2	97%	80%	120%	104%	80%	120%	97%	70%	130%
Dissolved Nickel	255899	255899	<2	<2	NA	< 2	98%	80%	120%	105%	80%	120%	NA	70%	130%
Dissolved Phosphorus	255899	255899	<0.02	<0.02	NA	< 0.02	101%	80%	120%	111%	80%	120%	97%	70%	130%
Dissolved Selenium	255899	255899	<1	<1	NA	< 1	102%	80%	120%	120%	80%	120%	118%	70%	130%
Dissolved Silver	255899	255899	<0.1	<0.1	NA	< 0.1	97%	80%	120%	98%	80%	120%	99%	70%	130%
Dissolved Strontium	255899	255899	10	11	NA	< 5	98%	80%	120%	102%	80%	120%	105%	70%	130%
Dissolved Thallium	255899	255899	<0.1	<0.1	NA	< 0.1	93%	80%	120%	101%	80%	120%	100%	70%	130%
Dissolved Tin	255899	255899	<2	<2	NA	< 2	91%	80%	120%	100%	80%	120%	95%	70%	130%
Dissolved Titanium	255899	255899	<2	<2	NA	< 2	100%	80%	120%	108%	80%	120%	107%	70%	130%
Dissolved Uranium	255899	255899	<0.1	<0.1	NA	< 0.1	90%	80%	120%	97%	80%	120%	93%	70%	130%
Dissolved Vanadium	255899	255899	<2	<2	NA	< 2	95%	80%	120%	99%	80%	120%	102%	70%	130%
Dissolved Zinc	255899	255899	<5	<5	NA	< 5	97%	80%	120%	102%	80%	120%	105%	70%	130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Total Phosphorus

Total Phosphorous as P	255882	255882	<0.03	<0.03	NA	< 0.03	88%	80%	120%	103%	80%	120%	103%	80%	120%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Total Phosphorus

Total Phosphorous as P	255698		<0.03	<0.03	NA	< 0.03	85%	80%	120%	100%	80%	120%	102%	80%	120%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Various Inorganics (Water)

Chemical Oxygen Demand	266708		19	18	3.6%	< 3	99%	80%	120%	NA			98%	80%	120%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 19X477047

PROJECT: 1895674

ATTENTION TO: Sheri Burton

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Jun 27, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Cyanide (Water)															
Free Cyanide	265085		<2	<2	NA	< 2	95%	70%	130%	104%	80%	120%	102%	70%	130%
Total Cyanide	255488		<0.002	<0.002	NA	< 0.002	96%	80%	120%	105%	90%	110%	109%	70%	130%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Dissolved Total Phosphorus (Water)															
Total Phosphorus, Dissolved	255833	255833	<0.02	<0.02	NA	< 0.02	94%	90%	110%	98%	90%	110%	97%	80%	120%
Dissolved Total Phosphorus (Water)															
Total Phosphorus, Dissolved	255891	255891	<0.02	<0.02	NA	< 0.02	99%	90%	110%	100%	90%	110%	97%	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															

Certified By: CoBrien

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Method Summary

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Miscellaneous Analysis			
Subcontracted Data			
Trace Organics Analysis			
Benzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Toluene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Ethylbenzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Xylene (Total)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
C6-C10 (less BTEX)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
>C10-C16 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C16-C21 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C21-C32 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Modified TPH (Tier 1)	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	CALCULATION
Resemblance Comment	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
Return to Baseline at C32	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - VPH	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
n-Dotriacontane - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Free Cyanide	INOR-93-6052	MOE METHOD CN- 3015 & SM 4500 CN- I	TECHNICON AUTO ANALYZER
Total Cyanide	INOR-93-6051	MOE 3015 & SM 4500 CN- A,B,C	TECHNICON AUTO ANALYZER
Total Phosphorus, Dissolved	INOR-93-6022	SM 4500-P B&E	SPECTROPHOTOMETER
Dissolved Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
Total Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
pH	INOR-121-6001	SM 4500 H+B	PC TITRATE
Reactive Silica as SiO2	INOR-121-6027	SM 4500-SiO2 F	COLORIMETER
Chloride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Fluoride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Alkalinity	INOR-121-6001	SM 2320 B	
True Color	INOR-121-6014	SM 2120 C	NEPHELOMETER
Turbidity	INOR-121-6022	SM 2130 B	NEPHELOMETER
Electrical Conductivity	INOR-121-6001	SM 2510 B	PC TITRATE
Nitrate + Nitrite as N	INORG-121-6005	SM 4110 B	CALCULATION
Nitrate as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-121-6047	SM 4500-NH3 H	COLORIMETER
Ortho-Phosphate as P	INOR-121-6012	SM 4500-P G	COLORIMETER
Dissolved Sodium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Potassium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Calcium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Magnesium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Bicarb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Carb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Hydroxide	INORG-121-6001	SM 2320 B	PC-TITRATE
Calculated TDS	CALCULATION	SM 1030E	CALCULATION
Hardness	CALCULATION	SM 2340B	CALCULATION
Langelier Index (@20C)	CALCULATION	CALCULATION	CALCULATION
Langelier Index (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 20C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Anion Sum	CALCULATION	SM 1030E	CALCULATION
Cation sum	CALCULATION	SM 1030E	CALCULATION
% Difference/ Ion Balance	CALCULATION	SM 1030E	CALCULATION
Dissolved Aluminum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Antimony	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Arsenic	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Barium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Beryllium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS

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Method Summary

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Dissolved Bismuth	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Boron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cadmium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Chromium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cobalt	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Lead	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Molybdenum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Nickel	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Phosphorus	MET-121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Selenium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Silver	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Strontium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Thallium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Tin	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Titanium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Uranium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Vanadium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Suspended Solids	INOR-121-6024, 6025	SM 2540C, D	GRAVIMETRIC
Total Phosphorous as P	INOR-121-6046	SM 4500-P H, EPA 365.4	COLORIMETER
Chemical Oxygen Demand	INORG-121-6013	SM 5220 B	SPECTROPHOTOMETER
Dissolved Organic Carbon	INOR-121-6026	SM 5310 B	TOC ANALYZER

Results relate only to the items tested. Results apply to samples as received.

AGAT Laboratories
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Dartmouth, NS
B3B 1M2
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Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: 6°, 7°, 4°
Hold Time:
AGAT Job Number: 19X477047
Notes:

Report Information
Company: Golder Associates
Contact: Glen Merkley
Address: 201 Brownlow Avenue, Suite 26
Dartmouth, NS, B3B 1W2
Phone: 9024661668 Fax: 9024661669
Client Project #: 1895674
AGAT Quotation: 204505
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Glen Merkley
Email: glen_merkley@golder.com
2. Name: Sheri Burton
Email: sheri_burton@golder.com

Report Format
☐ Single Sample per page
☑ Multiple Sample per page
☑ Excel Format Included
☐ Export:

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required:

Invoice To Same Yes ☑ / No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME
☐ Industrial
☐ Commercial
☐ Res/Park
☐ Agricultural
☐ FWAL
☐ Sediment
☑ CDWQ
☐ NSEQS-Cont Sites
☐ HRM 101
☐ Storm Water
☐ Waste Water
☑ Other NSE PSS - GW to SW <10m

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample:** ☐ Yes ☐ No
Reg. No.:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☑ Diss ☐ Available	Mercury Total + Dissolved	☐ BOD ☐ COD + DOC	pH	☑ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus + Dissolved (Misc.)	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Total and Free Cyanide	Other: Radium-226 – SPC	Hazardous (Y/N)
FMS-HG18-02A	Jun 5/19 - 16:00	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-02B	Jun 5/19 - 16:30	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-03A	Jun 5/19 - 17:15	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-03B	Jun 5/19 - 17:45	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-04A	Jun 6/19 - 14:45	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-04B	Jun 6/19 - 15:00	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-05A	Jun 6/19 - 15:30	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-05B	Jun 6/19 - 15:45	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-06A	Jun 6/19 - 12:45	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-07A	Jun 6/19 - 11:45	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-07B	Jun 6/19 - 12:20	GW	17	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓											✓	✓	
FMS-HG18-08A	Jun 5/19 - 11:30	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	

Samples Relinquished By (Print Name)	Date/Time	Samples Received By (Print Name)	Date/Time
Glen Merkley	7/Jun/19		7/Jun/19
Samples Relinquished By (Sign)	Date/Time	Samples Received By (Sign)	Date/Time
	13:24		1324

Pink Copy - Client
Yellow Copy - AGAT
White Copy- AGAT

Page 1 of 3
Nº:

Document ID: DIV-133-1501.002

Date revised: January 2016

Copper RDL - 1.0 ug/L, Mercury RDL - 0.016 ug/L

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Chain of Custody Record

Laboratory Use Only

Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: _____
Hold Time: _____
AGAT Job Number: 19X477047
Notes:

Report Information

Company: Golder Associates
Contact: Glen Merkley
Address: 201 Brownlow Avenue, Suite 26
Dartmouth, NS, B3B 1W2
Phone: 9024661668 Fax: 9024661669
Client Project #: 1895674
AGAT Quotation: 204505
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):

1. Name: Glen Merkley
   Email: glen_merkley@golder.com
2. Name: Sheri Burton
   Email: sheri_burton@golder.com

Report Format

☐ Single Sample per page
☑ Multiple Sample per page
☑ Excel Format Included
☐ Export:

Turnaround Time Required (TAT)

Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required: _____

Invoice To Same Yes ☑ / No ☐

Company: _____
Contact: _____
Address: _____
Phone: _____ Fax: _____
PO/Credit Card#: _____

Regulatory Requirements (Check):

☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube

☐ CCME
☐ Industrial
☐ Commercial
☐ Res/Park
☐ Agricultural
☐ FWAL
☐ Sediment

☑ CDWQ
☐ NSEQS-Cont Sites
☐ HRM 101
☐ Storm Water
☐ Waste Water
☑ Other NSE PSS - GW to SW <10m

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample:** ☐ Yes ☐ No
Reg. No.: _____

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☑ Diss ☐ Available	Mercury (Total + Diss.)	~~☐ BOD~~ ~~☐ COD~~ (COD + DOC)	pH	☑ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus + Dissolved (Diss)	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Total and Free Cyanide	Other: Radium-226	Hazardous (Y/N)
FMS-HG18-08B	Jun 5/19 - 11:45	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-09A	Jun 6/19 - 10:50	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-09B	Jun 6/19 - 11:10	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-10A	Jun 6/19 - 10:00	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-10B	Jun 6/19 - 10:20	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-11A	Jun 5/19 - 9:15	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-11B	Jun 5/19 - 9:30	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-13A	Jun 6/19 - 9:20	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-13B	Jun 6/19 - 9:00	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-14A	Jun 6/19 - 14:15	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-14B	Jun 6/19 - 14:30	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-15A	Jun 6/19 - 16:30	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	

Samples Relinquished By (Print Name)	Date/Time	Samples Received By (Print Name)	Date/Time
Samples Relinquished By (Sign): D. Merkley	Date/Time	Samples Received By (Sign):	Date/Time

Pink Copy - Client
Yellow Copy - AGAT
White Copy- AGAT

Page 2 of 3
N°:

Document ID: DIV-133-1501.002

Date revised: January 2016

Copper RDL - 1.0ug/L, Mercury RDL - 0.016ug/L

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Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: _____
Hold Time: _____
AGAT Job Number: 19X477047
Notes:

Report Information
Company: Golder Associates
Contact: Glen Merkley
Address: 201 Brownlow Avenue, Suite 26
Dartmouth, NS, B3B 1W2
Phone: 9024661668 Fax: 9024661669
Client Project #: 1895674
AGAT Quotation: 204505
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Glen Merkley
Email: glen_merkley@golder.com
2. Name: Sheri Burton
Email: sheri_burton@golder.com

Report Format
☐ Single Sample per page
☑ Multiple Sample per page
☑ Excel Format Included
☐ Export:

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required: _____

Invoice To Same Yes ☑ / No ☐
Company: _____
Contact: _____
Address: _____
Phone: _____ Fax: _____
PO/Credit Card#: _____

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME
☐ Industrial
☐ Commercial
☐ Res/Park
☐ Agricultural
☐ FWAL
☐ Sediment
☑ CDWQ
☐ NSEQS-Cont Sites
☐ HRM 101
☐ Storm Water
☐ Waste Water
☑ Other NSE PSS - GW to SW <10m

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample:** ☐ Yes ☐ No
Reg. No.: _____

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☑ Diss ☐ Available	Mercury (Total + Diss)	☐ BOD ☐ COD (COD + DOC)	pH	☑ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus + Diss. (Miss.)	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Total and Free Cyanide	Other: Radium-226	Hazardous (Y/N)
FMS-HG18-15B	Jun 6/19 - 16:50	GW	17	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓											✓	✓	
FMS-HG18-16A	Jun 5/19 - 11:40	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
FMS-HG18-16B	Jun 5/19 - 11:20	GW	15	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓											✓	✓	
DUP-A	Jun 6/19 - 11:10	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
DUP-B	Jun 6/19 - 10:20	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	
DUP-C	Jun 6/19 - 9:00	GW	13	Field filtered for all preserved samples		✓	✓	✓			✓		✓		✓												✓	

Samples Relinquished By (Print Name)	Date/Time	Samples Received By (Print Name)	Date/Time
Samples Relinquished By (Sign)	Date/Time	Samples Received By (Sign)	Date/Time

Pink Copy - Client
Yellow Copy - AGAT
White Copy- AGAT

Page 3 of 3
N°:

Document ID: DIV-133-1501.002

Date revised: January 2016

Copper RDL - 1.0 µg/L, mercury RDL - 0.016 µg/L

SASKATCHEWAN RESEARCH COUNCIL

Environmental Analytical Laboratories
143-111 Research Drive, Saskatoon, SK Canada S7N 3R2

T: 306-933-6932 **F:** 306-933-7922
Toll-free: 1-800-240-8808
E: analytical@src.sk.ca

www.src.sk.ca/analytical

SRC Group # 2019-7714

Jun 24, 2019

AGAT Laboratories
122-11 Morris Drive
Dartmouth, NS B3B 1M2
Attn: Janetta Fraser

Date Samples Received: Jun-11-2019 Client P.O.: 136118

All results have been reviewed and approved by a Qualified Person in accordance with the Saskatchewan Environmental Code, Corrective Action Plan Chapter, for the purposes of certifying a laboratory analysis

Results from Lab Sections 1 and 2 have been authorized by Keith Gipman, Supervisor
Results from Lab Section 3 and 7 have been authorized by Pat Moser, Supervisor
Results from Lab Sections 4 and 5 have been authorized by Vicky Snook, Supervisor
Results from Lab Section 6 have been authorized by Marion McConnell, Supervisor

---

* Test methods and data are validated by the laboratory's Quality Assurance Program.

* Routine methods follow recognized procedures from sources such as
    * Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF
    * Environment Canada
    * US EPA
    * CANMET

* The results reported relate only to the test samples as provided by the client.

* Samples will be kept for 30 days after the final report is sent. Please contact the lab if you have any special requirements.

* Additional information is available upon request.

This is a final report.

SASKATCHEWAN RESEARCH COUNCIL

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SRC Group # 2019-7714

Jun 24, 2019

AGAT Laboratories

122-11 Morris Drive
Dartmouth, NS B3B 1M2
Attn: Janetta Fraser

Date Samples Received: Jun-11-2019 Client P.O.: 136118

30886	**06/05/2019 19X477047-255833M-FMS-HG18-02A *WATER***
30887	**06/05/2019 19X477047-255872M-FMS-HG18-02B *WATER***
30888	**06/05/2019 19X477047-255873M-FMS-HG18-03A *WATER***

Analyte	Units	30886	30887	30888
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	<0.005	<0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 11.1 °C upon receipt.

SASKATCHEWAN RESEARCH COUNCIL

Environmental Analytical Laboratories
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SRC Group # 2019-7714

Jun 24, 2019

AGAT Laboratories

30889	**06/05/2019**	**19X477047-255874M-FMS-HG18-03B *WATER***
30890	**06/05/2019**	**19X477047-255875M-FMS-HG18-04A *WATER***
30891	**06/05/2019**	**19X477047-255876M-FMS-HG18-04B *WATER***

Analyte	Units	30889	30890	30891
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	0.02	<0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 11.1 °C upon receipt.

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SRC Group # 2019-7714

Jun 24, 2019

AGAT Laboratories

30892	**06/05/2019**	**19X477047-255877M-FMS-HG18-05A *WATER***
30893	**06/05/2019**	**19X477047-255878M-FMS-HG18-05B *WATER***
30894	**06/05/2019**	**19X477047-255879M-FMS-HG18-06A *WATER***

Analyte	Units	30892	30893	30894
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	<0.005	<0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 11.1 °C upon receipt.

SASKATCHEWAN RESEARCH COUNCIL

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SRC Group # 2019-7714

Jun 24, 2019

AGAT Laboratories

30895	**06/05/2019**	**19X477047-255880M-FMS-HG18-07A *WATER***
30896	**06/05/2019**	**19X477047-255881M-FMS-HG18-07B *WATER***
30897	**06/05/2019**	**19X477047-255882M-FMS-HG18-08A *WATER***

Analyte	Units	30895	30896	30897
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.02	0.005	<0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 11.1 °C upon receipt.

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SRC Group # 2019-7714

Jun 24, 2019

AGAT Laboratories

30898	**06/05/2019**	**19X477047-255883M-FMS-HG18-08B *WATER***
30899	**06/05/2019**	**19X477047-255884M-FMS-HG18-09A *WATER***
30900	**06/05/2019**	**19X477047-255885M-FMS-HG18-09B *WATER***

Analyte	Units	30898	30899	30900
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	0.006	0.02	<0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 11.1 °C upon receipt.

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SRC Group # 2019-7714

Jun 24, 2019

AGAT Laboratories

30901	**06/05/2019**	**19X477047-255886M-FMS-HG18-10A *WATER***
30902	**06/05/2019**	**19X477047-255887M-FMS-HG18-10B *WATER***
30903	**06/05/2019**	**19X477047-255888M-FMS-HG18-11A *WATER***

Analyte	Units	30901	30902	30903
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	<0.005	0.009

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 11.1 °C upon receipt.

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SRC Group # 2019-7714

Jun 24, 2019

AGAT Laboratories

30904	**06/05/2019**	**19X477047-255889M-FMS-HG18-11B *WATER***
30905	**06/05/2019**	**19X477047-255890M-FMS-HG18-13A *WATER***
30906	**06/05/2019**	**19X477047-255891M-FMS-HG18-13B *WATER***

Analyte	Units	30904	30905	30906
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	<0.005	<0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 11.1 °C upon receipt.

SASKATCHEWAN RESEARCH COUNCIL

Environmental Analytical Laboratories
143-111 Research Drive, Saskatoon, SK Canada S7N 3R2

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E: analytical@src.sk.ca

www.src.sk.ca/analytical

SRC Group # 2019-7714

Jun 24, 2019

AGAT Laboratories

30907	**06/05/2019**	**19X477047-255829M-FMS-HG18-14A *WATER***
30908	**06/05/2019**	**19X477047-255893M-FMS-HG18-14B *WATER***
30909	**06/05/2019**	**19X477047-255894M-FMS-HG18-15A *WATER***

Analyte	Units	30907	30908	30909
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	0.006	0.01

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 11.1 °C upon receipt.

SASKATCHEWAN RESEARCH COUNCIL

Environmental Analytical Laboratories
143-111 Research Drive, Saskatoon, SK Canada S7N 3R2

T: 306-933-6932 **F:** 306-933-7922
Toll-free: 1-800-240-8808
E: analytical@src.sk.ca

www.src.sk.ca/analytical

SRC Group # 2019-7714

Jun 24, 2019

AGAT Laboratories

30910	**06/05/2019**	**19X477047-255895M-FMS-HG18-15B *WATER***
30911	**06/05/2019**	**19X477047-255896M-FMS-HG18-16A *WATER***
30912	**06/05/2019**	**19X477047-255897M-FMS-HG18-16B *WATER***

Analyte	Units	30910	30911	30912
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	0.01	0.008

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 11.1 °C upon receipt.

SASKATCHEWAN RESEARCH COUNCIL

Environmental Analytical Laboratories
143-111 Research Drive, Saskatoon, SK Canada S7N 3R2

T: 306-933-6932 **F:** 306-933-7922
Toll-free: 1-800-240-8808
E: analytical@src.sk.ca

www.src.sk.ca/analytical

SRC Group # 2019-7714

Jun 24, 2019

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30913	**06/05/2019 19X477047-255898M-DUP-A *WATER***
30914	**06/05/2019 19X477047-255899M-DUP-B *WATER***
30915	**06/05/2019 19X477047-255900M-DUP-C *WATER***

Analyte	Units	30913	30914	30915
Lab Section 4 (Radiochemistry)				
Radium-226	Bq/L	<0.005	<0.005	0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 11.1 °C upon receipt.

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