Appendix B.10

Final – Long-Term Groundwater Monitoring Technical Memorandum, Golder Associates

TECHNICAL MEMORANDUM

DATE February 24, 2020 **Project No.** 1895674-011

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

CC Sheri Burton

FROM Phyllis McCrindle **EMAIL Phyllis_McCrindle@golder.com**

LONG-TERM GROUNDWATER MONITORING, FIFTEEN MILE STREAM, ROUND 8

1.0 INTRODUCTION

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

This technical memo presents the results of Round 8 of the long-term groundwater monitoring conducted for the Project, 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

AGC is planning to construct, operate, and eventually reclaim a new open pit gold mine at the Project site. 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.

Golder Associates Ltd.
201 Brownlow Avenue, Suite 26, Dartmouth, Nova Scotia, B3B 1W2, Canada T: +1 902 466 1668 F: +1 902 466 1669

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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 long-term groundwater monitoring were to collect baseline data on the local groundwater levels and quality. This baseline hydrogeological data will provide a hydrogeological technical background for the EIS submission for the FMS project.

3.0 BACKGROUND INFORMATION

For background information on the FMS site surficial geology, bedrock geology, and groundwater conditions from Round 1-6 monitoring events, see the “Fifteen Mile Stream Gold Project Hydrogeological Investigation”, dated September 10, 2019.

4.0 INVESTIGATION METHODOLODY

This section describes the site investigation program, including the number and location of boreholes. Herein is described the methodology for collecting groundwater levels and laboratory testing of groundwater quality samples.

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 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	12.3
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
FMS-HG18-14A	536802.34	4998352.85	116.89	13.81

Borehole / Monitoring Well ID	Coordinates (UTM Zone 20, NAD83[CSRS])		Ground Surface Elevation (m CGVD28)	Drilled Depth (mbgs[1])
	Northing (m)	Easting (m)		
FMS-HG18-14B	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 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 that they can be converted to equivalent groundwater elevations for comparison across the site.

4.3 Laboratory Testing

Groundwater samples were collected from each monitoring well on-site from September 4 to 6, 2018 (Round 1), from November 19 to 20, 2018 (Round 3), from March 21 to 22, 2019 (Round 5), from June 5 to 6, 2019 (Round 6), from October 2 to 3, 2019 (Round 7), and January 7 and 10, 2020. Prior to the collection of samples, each monitoring well was developed by the removal of 10 well volumes of water, or by pumping the well dry and allowing it to recover three times. This development process was done 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. Samples containing preservatives, including petroleum hydrocarbons, cyanide, mercury,

dissolved metals, phosphorous, chemical oxygen demand, dissolved organic carbon, radium-226, and a portion of the general chemistry bottles, were first filtered using 0.45 micron in-line filters to reduce turbidity. 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 analysed for the following parameter suites: Atlantic RBCA Tier 1 Hydrocarbons (including benzene, toluene, ethylbenzene, and 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 groundwater level measurements and laboratory testing results.

5.1 Groundwater Levels

Data from eight complete groundwater level monitoring rounds of the wells installed at FMS are presented in Table 2, 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. Hydrographs for select wells showing the manual and continuous groundwater levels are presented alongside precipitation records in Appendix A.

The groundwater levels measured were shallow, ranging from 0.13 to 5.16 mbgs. Groundwater elevations ranged from 103.42 to 160.52 m relative to CGVD28. In general, 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 slightly downward or nearly neutral gradients. Slight upward gradients between A/B well pairs were observed at locations FMS-HG18-04, -09, and -16. It should be noted that wells FMS-HG18-14A and FMS-HG18-14B were inaccessible in January 2020, due to road conditions.

The hydrographs for wells at FMS-HG18-02, -04, -05, -07, -09, and -10 (Appendix A) generally show consistent groundwater levels over the monitoring period to date. Some fluctuation in groundwater levels is apparent, likely related to precipitation events. Precipitation data shown on the hydrographs between August 2018 and June 6, 2019, is from the Malay Falls weather station, located approximately 18 km from the site. Precipitation data presented between June 7, 2019, and January 6, 2020, is from the Upper Stewiacke weather station, located approximately 42 km from the site, as data was no longer available from Malay Falls.

Table 2: Groundwater levels for FMS 2018 Hydrogeological Boreholes

Borehole	Water Level (mbgs), Collected on Aug. 15, 2018	Water Level (m CGVD28), Collected on Aug. 15, 2018	Water Level (mbgs), Collected on Aug. 20, 2018	Water Level (m CGVD28), Collected on Aug. 20, 2018	Water Level (mbgs), Collected on Sep. 4-6, 2018	Water Level (m CGVD28), Collected on Sep. 4-6, 2018	Water Level (mbgs), Collected on Oct. 9, 2018	Water Level (m CGVD28), Collected on Oct. 9, 2018	Water Level (mbgs), Collected on Nov. 17-18, 2018	Water Level (m CGVD28), Collected on Nov. 17-18, 2018	Water Level (mbgs), Collected on Dec. 11, 2018	Water Level (m CGVD28), Collected on Dec. 11, 2018	Water Level (mbgs), Collected on Mar. 19-21, 2019	Water Level (m CGVD28), Collected on Mar. 19-21, 2019	Water Level (mbgs), Collected on Jun. 4, 2019	Water Level (m CGVD28), Collected on Jun. 4, 2019	Water Level (mbgs), Collected on Oct. 1-2, 2019	Water Level (m CGVD28), Collected on Oct. 1-2, 2019	Water Level (mbgs), Collected on Jan. 6-7, 2020	Water Level (m CGVD28), Collected on Jan. 6-7, 2020
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	3.73	132.24	3.41	132.56
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	3.51	132.34	3.14	132.71
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	4.48	117.10	4.11	117.47
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	4.60	117.17	4.35	117.42
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	2.02	104.64	1.52	105.14
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	3.04	103.63	2.44	104.23
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	2.35	111.18	1.96	111.57
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	2.07	111.61	1.61	112.07
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	1.46	110.51	1.44	110.53
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.		1.29	112.59	0.51	112.47	0.34	112.64
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.		1.16	112.60	0.30	112.48	0.20	112.58
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	2.72	137.31	2.34	137.69

Borehole	Water Level (mbgs), Collected on Aug. 15, 2018	Water Level (m CGVD28), Collected on Aug. 15, 2018	Water Level (mbgs), Collected on Aug. 20, 2018	Water Level (m CGVD28), Collected on Aug. 20, 2018	Water Level (mbgs), Collected on Sep. 4-6, 2018	Water Level (m CGVD28), Collected on Sep. 4-6, 2018	Water Level (mbgs), Collected on Oct. 9, 2018	Water Level (m CGVD28), Collected on Oct. 9, 2018	Water Level (mbgs), Collected on Nov. 17-18, 2018	Water Level (m CGVD28), Collected on Nov. 17-18, 2018	Water Level (mbgs), Collected on Dec. 11, 2018	Water Level (m CGVD28), Collected on Dec. 11, 2018	Water Level (mbgs), Collected on Mar. 19-21, 2019	Water Level (m CGVD28), Collected on Mar. 19-21, 2019	Water Level (mbgs), Collected on Jun. 4, 2019	Water Level (m CGVD28), Collected on Jun. 4, 2019	Water Level (mbgs), Collected on Oct. 1-2, 2019	Water Level (m CGVD28), Collected on Oct. 1-2, 2019	Water Level (mbgs), Collected on Jan. 6-7, 2020	Water Level (m CGVD28), Collected on Jan. 6-7, 2020
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	2.52	137.46	1.88	138.10
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	2.20	121.38	1.73	121.85
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	1.66	121.96	1.01	122.61
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	1.44	138.87	1.18	139.13
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	1.32	138.87	1.12	139.07
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	4.08	158.30	3.55	158.83
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	3.43	158.98	2.45	159.96
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	3.79	147.50	3.16	148.13
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	1.87	149.46	0.72	150.61
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	4.67	112.22	Inaccessible due to road conditions	
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	4.64	112.33	Inaccessible due to road conditions	
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.		1.52	106.94	0.62	106.84	0.53	106.93

Borehole	Water Level (mbgs), Collected on Aug. 15, 2018	Water Level (m CGVD28), Collected on Aug. 15, 2018	Water Level (mbgs), Collected on Aug. 20, 2018	Water Level (m CGVD28), Collected on Aug. 20, 2018	Water Level (mbgs), Collected on Sep. 4-6, 2018	Water Level (m CGVD28), Collected on Sep. 4-6, 2018	Water Level (mbgs), Collected on Oct. 9, 2018	Water Level (m CGVD28), Collected on Oct. 9, 2018	Water Level (mbgs), Collected on Nov. 17-18, 2018	Water Level (m CGVD28), Collected on Nov. 17-18, 2018	Water Level (mbgs), Collected on Dec. 11, 2018	Water Level (m CGVD28), Collected on Dec. 11, 2018	Water Level (mbgs), Collected on Mar. 19-21, 2019	Water Level (m CGVD28), Collected on Mar. 19-21, 2019	Water Level (mbgs), Collected on Jun. 4, 2019	Water Level (m CGVD28), Collected on Jun. 4, 2019	Water Level (mbgs), Collected on Oct. 1-2, 2019	Water Level (m CGVD28), Collected on Oct. 1-2, 2019	Water Level (mbgs), Collected on Jan. 6-7, 2020	Water Level (m CGVD28), Collected on Jan. 6-7, 2020
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	0.91	106.65	0.84	106.72
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	2.97	139.20	1.82	140.35
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	3.40	138.79	0.92	141.27

5.2 Analytical Results

5.2.1 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 freshwater body). Groundwater quality results are shown compared to the CDWQ and the NSE PSS, in the laboratory results provided in Appendix B. The results of the laboratory analysis are summarized as follows:

- PHC/BTEX and were not detected in any of the samples collected.
- Free and total cyanide was not detected in any of the samples collected in January 2020. Total cyanide was detected in well FMS-HG18-15B in the March 2019 sampling event below CDWQ and NSE PSS guidelines (0.038 mg/L) but was not detected in any other sampling event.
- Total and dissolved mercury were not detected during the January 2020 sampling event. 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 of the samples collected.
- Table 3 (below) provides a summary of the groundwater exceedances of the CDWQ MAC for the September 2018, November 2018, March 2019, June 2019, October 2019, and January 2020 sampling events:
  - Dissolved arsenic exceeded in CDWQ MAC in six wells in January 2020 (FMS-HG18-02A, FMS-HG18-04A, FMS-HG18-05A, FMS-HG18-06A, FMS-HG18-07A, and FMS-HG18-07B), all of which exceeded in previous sampling events.
  - Dissolved manganese exceeded the CDWQ in 12 wells in January 2020 (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. The September 2018, November 2018, and March 2019 sampling events were not compared to the new Health Canada CDWQ guideline; however, concentrations reported for the June 2019, October 2019, and January 2020 sampling events are consistent with manganese concentrations from previous sampling events.
  - Aluminum and iron exceeded aesthetic objectives (AO)/operational guidance (OG) values in multiple wells during all monitoring events. Zinc exceeded the AO in November 2018 only.
  - 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, June, October 2019, and January 2020 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, June 2019, October 2019, and January 2020 sampling events are presented in Table 4. Metals parameters exceeding the NSE PSS in January 2020 included dissolved aluminum, arsenic, cadmium, cobalt, copper, iron, manganese, silver, and zinc. All of these parameters have exceeded historically. 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 4.

Table 3: Groundwater Concentrations Exceeding the MAC

Monitoring Well ID	Groundwater Concentrations Exceeding the MAC					
	September 2018	November 2018	March 2019	June 2019	October 2019	January 2020
FMS-HG18-02A	None	None	Dissolved arsenic	Dissolved arsenic	Dissolved arsenic	Dissolved arsenic
FMS-HG18-02B	None	None	None	None	None	None
FMS-HG18-03A	Dissolved arsenic	Dissolved arsenic	Dissolved arsenic	Dissolved manganese	Dissolved arsenic	None
FMS-HG18-03B	None	None	None	None	None	None
FMS-HG18-04A	Dissolved arsenic	Dissolved arsenic	Dissolved arsenic	Dissolved arsenic and manganese	Dissolved arsenic and manganese	Dissolved arsenic and manganese
FMS-HG18-04B	None	None	None	Dissolved manganese	Dissolved manganese	Dissolved manganese
FMS-HG18-05A	Dissolved arsenic	Dissolved arsenic	Dissolved arsenic	Dissolved arsenic	Dissolved arsenic	Dissolved arsenic
FMS-HG18-05B	None	None	None	None	None	None
FMS-HG18-06A	Dissolved arsenic	None	Dissolved arsenic	Dissolved manganese	Dissolved arsenic and manganese	Dissolved arsenic and manganese
FMS-HG18-07A	Dissolved arsenic	Dissolved arsenic	Not sampled, as well frozen	Dissolved arsenic and manganese	Dissolved arsenic and manganese	Dissolved arsenic and manganese
FMS-HG18-07B	Dissolved arsenic	Dissolved arsenic	Not sampled, as well frozen	Dissolved arsenic and manganese	Dissolved arsenic and manganese	Dissolved arsenic and manganese

Monitoring Well ID	Groundwater Concentrations Exceeding the MAC					
	September 2018	November 2018	March 2019	June 2019	October 2019	January 2020
FMS-HG18-08A	None	None	None	None	None	None
FMS-HG18-08B	None	None	None	None	None	None
FMS-HG18-09A	None	None	None	Dissolved manganese	Dissolved manganese	Dissolved manganese
FMS-HG18-09B	None	None	None	Dissolved manganese	Dissolved manganese	Dissolved manganese
FMS-HG18-10A	None	None	None	None	Dissolved manganese	None
FMS-HG18-10B	None	None	None	None	None	None
FMS-HG18-11A	None	None	None	Dissolved manganese	Dissolved manganese	Dissolved manganese
FMS-HG18-11B	None	None	None	Dissolved manganese	Dissolved manganese	Dissolved and manganese
FMS-HG18-13A	None	None	None	None	None	None
FMS-HG18-13B	None	None	None	None	None	None
FMS-HG18-14A	None	None	None	None	Dissolved uranium	Inaccessible
FMS-HG18-14B	None	None	None	None	None	Inaccessible
FMS-HG18-15A	Dissolved arsenic	Dissolved arsenic	Not sampled, as well frozen	Dissolved manganese	None	Dissolved manganese
FMS-HG18-15B	None	None	None	Dissolved manganese	Dissolved manganese	Dissolved manganese
FMS-HG18-16A	None	None	None	Dissolved manganese	None	Dissolved manganese
FMS-HG18-16B	None	None	None	None	None	None

Table 4: 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	October 2019	January 2020
FMS-HG18-02A	Aluminum and arsenic	Aluminum and arsenic	Arsenic and copper	Arsenic and copper	Arsenic and copper	Arsenic, copper, and silver
FMS-HG18-02B	Aluminum, iron, and manganese	Aluminum, cadmium, and copper	Aluminum, cadmium, and copper	Aluminum and copper	Aluminum, cadmium, and copper	Aluminium and copper
FMS-HG18-03A	Arsenic	Aluminum and arsenic	Arsenic	Aluminum and arsenic	Aluminum and arsenic	Arsenic
FMS-HG18-03B	Cadmium, copper, and zinc	Aluminum	Cadmium, copper, and silver	Silver	Cadmium, copper, and silver	Copper
FMS-HG18-04A	Aluminum, arsenic, and cadmium	Aluminum and arsenic	Arsenic	Aluminum	Aluminum and arsenic	Arsenic
FMS-HG18-04B	Cadmium, manganese, and zinc	Cadmium, iron, manganese, and zinc	Cadmium, iron, manganese, and zinc	Cadmium and zinc	Aluminum, cadmium, iron, and zinc	Cadmium and zinc
FMS-HG18-05A	Aluminum, arsenic, and cadmium	Aluminum and arsenic	Arsenic	Aluminum	Aluminum, arsenic, cadmium, and copper	Aluminum, arsenic, and copper
FMS-HG18-05B	Aluminum, arsenic, and cadmium	Aluminum, cadmium, and copper	Aluminum, cadmium, and copper	Aluminum, cadmium, and copper	Aluminum, arsenic, cadmium, and copper	Aluminum, cadmium, and copper
FMS-HG18-06A	Aluminum, arsenic, iron, manganese, and total mercury	Aluminum and cadmium	Aluminum, arsenic, and iron	Aluminum and cadmium	Aluminum, arsenic, cadmium, and iron	Aluminum, arsenic, cadmium, and iron

Monitoring Well ID	Dissolved Groundwater Concentrations Exceeding the NSE PSS					
	September 2018	November 2018	March 2019	June 2019	October 2019	January 2020
FMS-HG18-07A	Arsenic	Arsenic	Not sampled, as well frozen	Arsenic	Aluminum and arsenic	Arsenic
FMS-HG18-07B	Aluminum, arsenic, and iron	Aluminum, arsenic, and iron	Not sampled, as well frozen	Aluminum, arsenic, and iron	Aluminum, arsenic, and iron	Aluminum, arsenic, and iron
FMS-HG18-08A	None	None	None	None	Aluminium	None
FMS-HG18-08B	Copper	Aluminum and cadmium	Aluminum	Aluminum, cadmium, and silver	Aluminium and silver	Aluminum and cadmium
FMS-HG18-09A	None	None	None	None	Aluminum	None
FMS-HG18-09B	Cadmium, silver, and zinc	Cadmium and copper	Cadmium, copper, and iron	Aluminum, cadmium, copper, and iron	Cadmium and copper	Cadmium, copper, and iron
FMS-HG18-10A	Cadmium and zinc	Aluminum	Aluminum	Aluminum	Aluminium	Aluminium
FMS-HG18-10B	Aluminum and cadmium	Aluminum	Aluminum and cadmium	Aluminum	Aluminium and silver	Aluminium
FMS-HG18-11A	Cadmium and manganese	Cadmium and manganese	Cadmium and manganese	Cadmium and manganese	Cadmium and manganese	Cadmium and manganese
FMS-HG18-11B	Aluminum, cadmium, copper, manganese, and total mercury	Aluminum, cadmium, cobalt, copper, iron, and manganese	Aluminum, cobalt, copper, iron, and manganese	Aluminum, cadmium, cobalt, iron, manganese, and selenium	Aluminium, cadmium, cobalt, manganese, and selenium	Aluminium, cadmium, cobalt, copper, and manganese
FMS-HG18-13A	None	Aluminum	Aluminum	None	None	None

Monitoring Well ID	Dissolved Groundwater Concentrations Exceeding the NSE PSS					
	September 2018	November 2018	March 2019	June 2019	October 2019	January 2020
FMS-HG18-13B	Aluminum, copper and, silver	Aluminum, copper, and silver	Aluminum, cadmium, copper, and silver	Aluminum and silver	Aluminum and silver	Aluminum
FMS-HG18-14A	Arsenic and cadmium	Cadmium	Cadmium	Aluminum	Cadmium	Inaccessible
FMS-HG18-14B	Cadmium	Aluminum, cadmium, and copper	Aluminum and cadmium	Aluminum and cadmium	Cadmium	Inaccessible
FMS-HG18-15A	Aluminum and arsenic	Aluminum, arsenic, and mercury, and total mercury	Not sampled, as well frozen	Arsenic	None	Arsenic
FMS-HG18-15B	None	None	Aluminum	None	Arsenic	None
FMS-HG18-16A	None	None	Silver	None	Cadmium	None
FMS-HG18-16B	Aluminum, cadmium, and copper	Aluminum, cadmium, copper, and silver	Aluminum, copper, and silver	Aluminum, cadmium, copper, and silver	Aluminum and cadmium	Aluminum, cadmium, copper, and silver

Note:

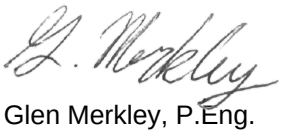
1. The analytical results for the September 2018, November 2018, March 2019, and June 2019 sampling events are presented in the "Fifteen Mile Stream Gold Project Hydrogeological Investigation" report, dated September 10, 2019.
2. The NSE PSS for Groundwater (NSE PSS) for groundwater discharging to surface water (0-10 m from a freshwater body) are equivalent to the NSE Tier 1 Environmental Quality Standards (EQS) for surface water.

6.0 CLOSURE

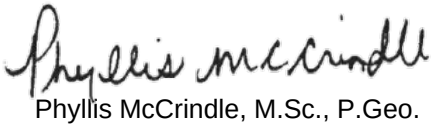
The information presented in this technical memo describes the results of long-term groundwater monitoring Round 8 at the FMS Project site, with the objective of supporting the EIS process necessary to develop the Project.

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

Golder Associates Ltd.



Glen Merkley, P.Eng.
Environmental Services Practitioner



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

GM/PM/sg/sm

https://golderassociates.sharepoint.com/sites/23819g/deliverables/1895674-011-tm-monitoring rnd 8 fms/1895674-011-tm-rev0-monitoring rnd 8 fms-2402_20.docx

Attachments: Appendix A – Groundwater Level Hydrographs
Appendix B – Groundwater Quality

References

Health Canada. (2019). Guidelines for Canadian Drinking Water Quality Summary Table.

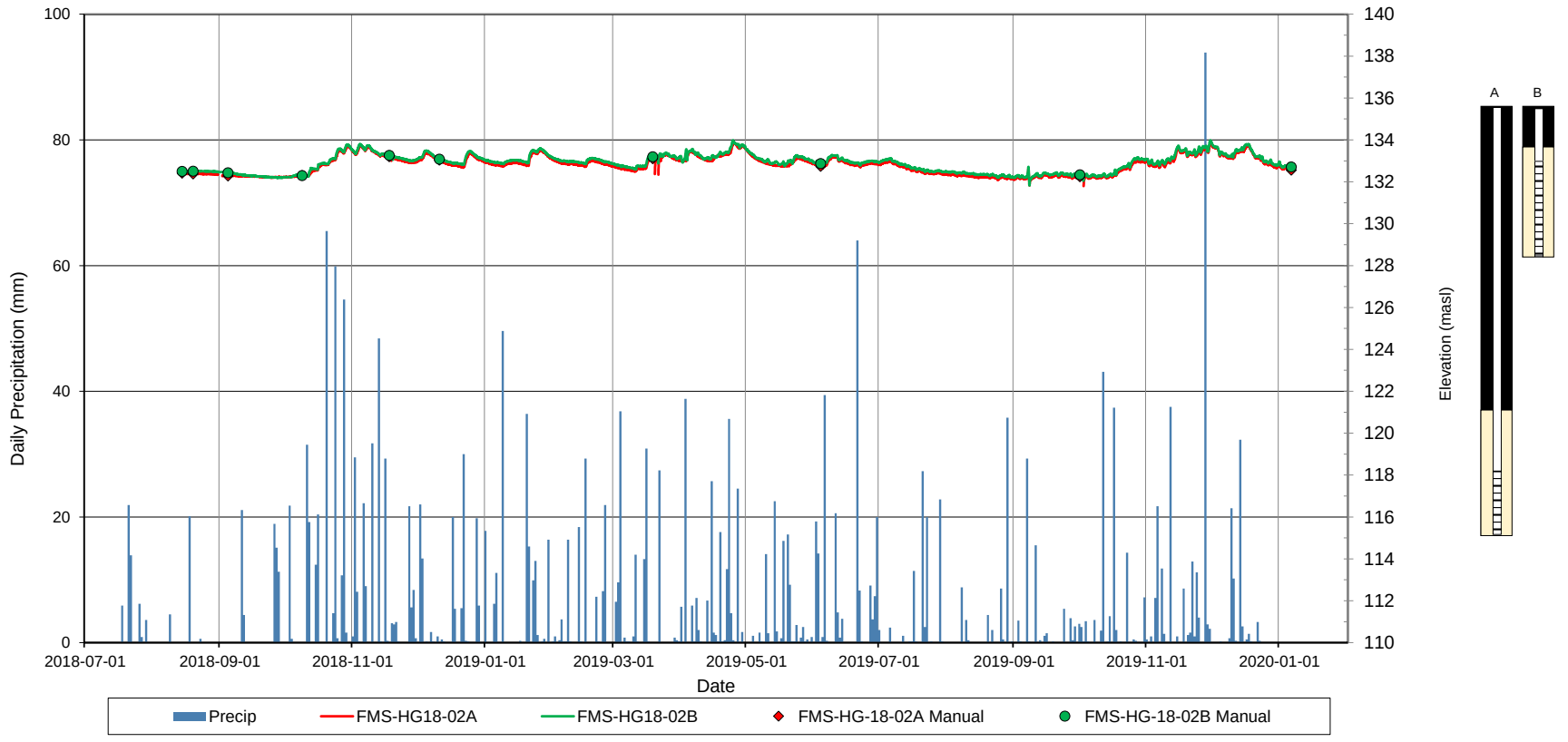
Nova Scotia Environment. (2013). Remediation Levels Protocol. Table 3, Pathway Specific Standards for Groundwater.

APPENDIX A

Groundwater Level Hydrographs

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

FIGURE 1



DATE: February 2020

PROJECT: 1895674

Note: Precipitation data from Malay Falls, NS Station, Approximately 18 km away from August 2018 to June 6, 2019 and from the Upper Stewiacke approximately 42 km away from June 7, 2019 to January 6, 2020.

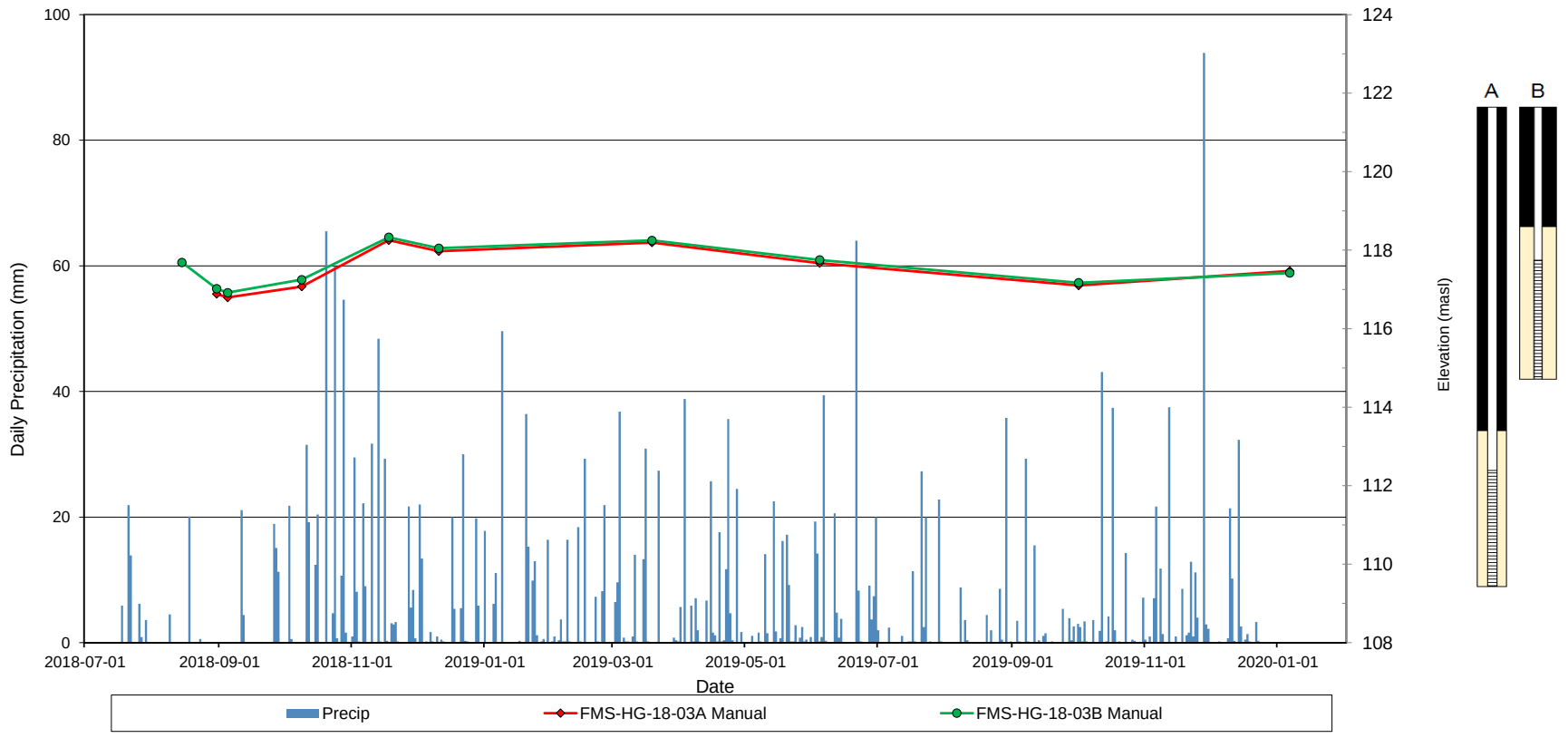
GOLDER

Prepared: CDM

Checked: PMMC

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

FIGURE 2



DATE: February 2020

PROJECT: 1895674

Note: Precipitation data from Malay Falls, NS Station, Approximately 18 km away from August 2018 to June 6, 2019 and from the Upper Stewiacke approximately 42 km away from June 7, 2019 to January 6, 2020.

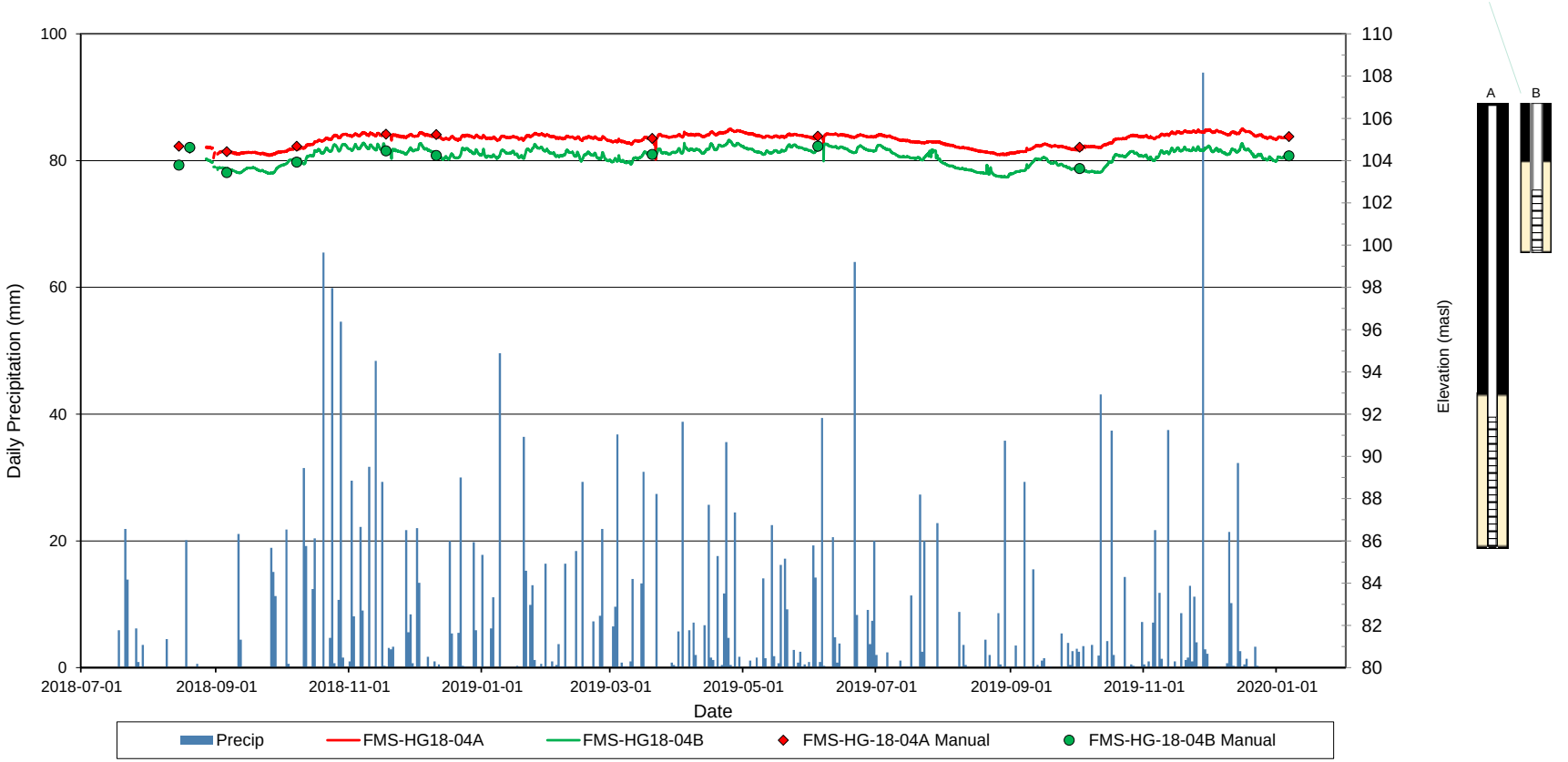
GOLDER

Prepared: CDM

Checked: PMMC

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

FIGURE 3



DATE: February 2020

PROJECT: 1895674

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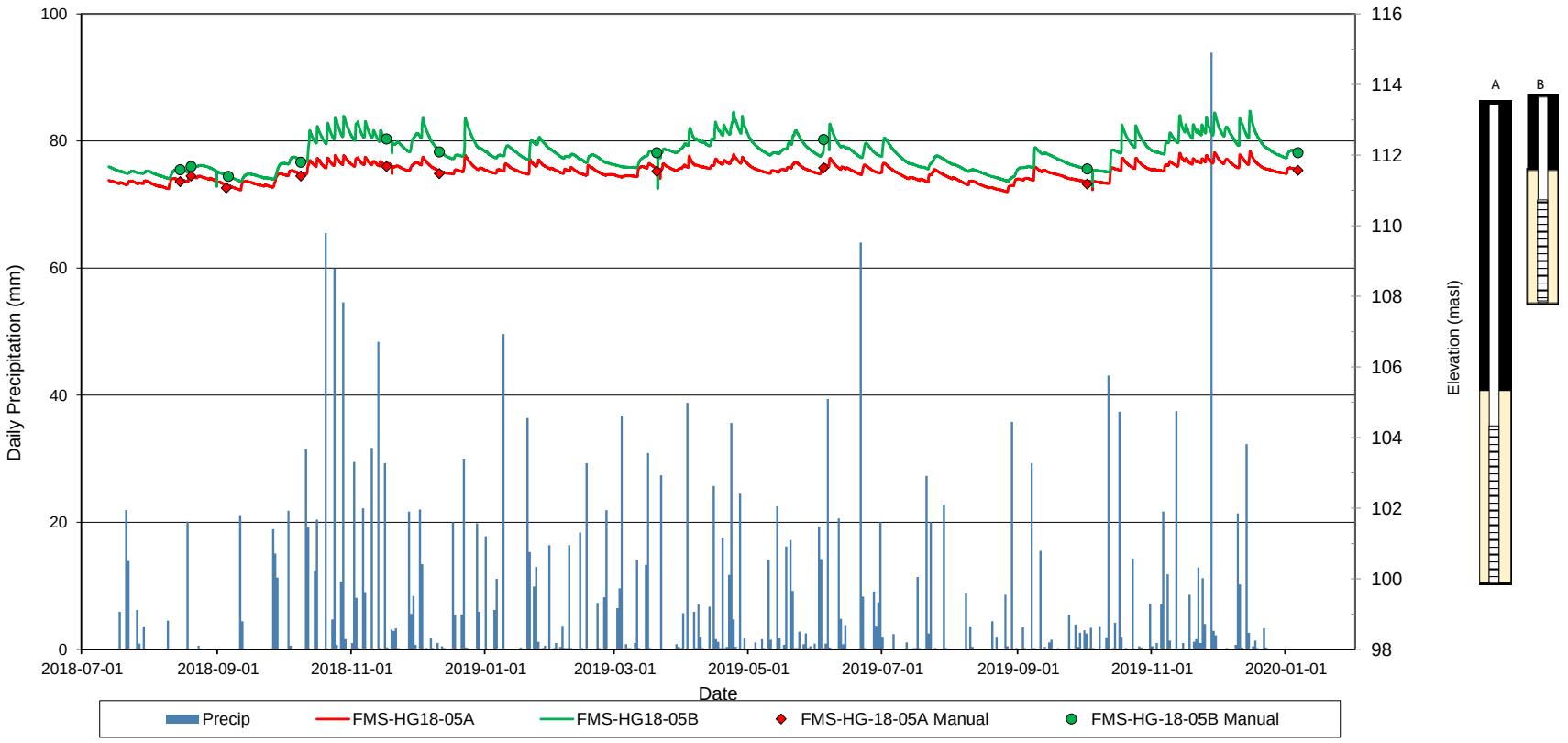
GOLDER

Prepared: CDM

Checked: PMMC

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

FIGURE 4



DATE: February 2020

PROJECT: 1895674

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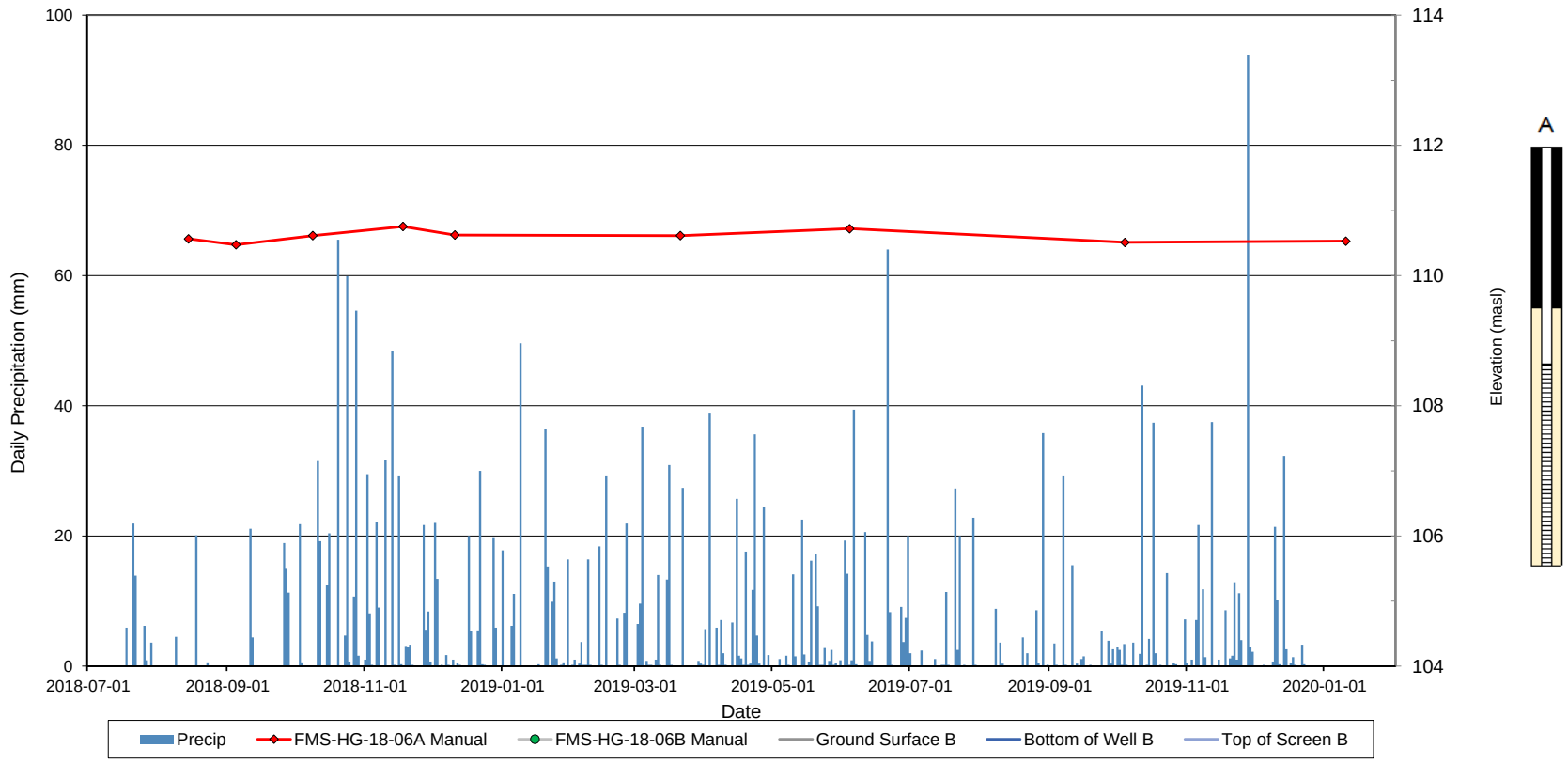
GOLDER

Prepared: CDM

Checked: PMMC

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

FIGURE 5



DATE: February 2020

PROJECT: 1895674

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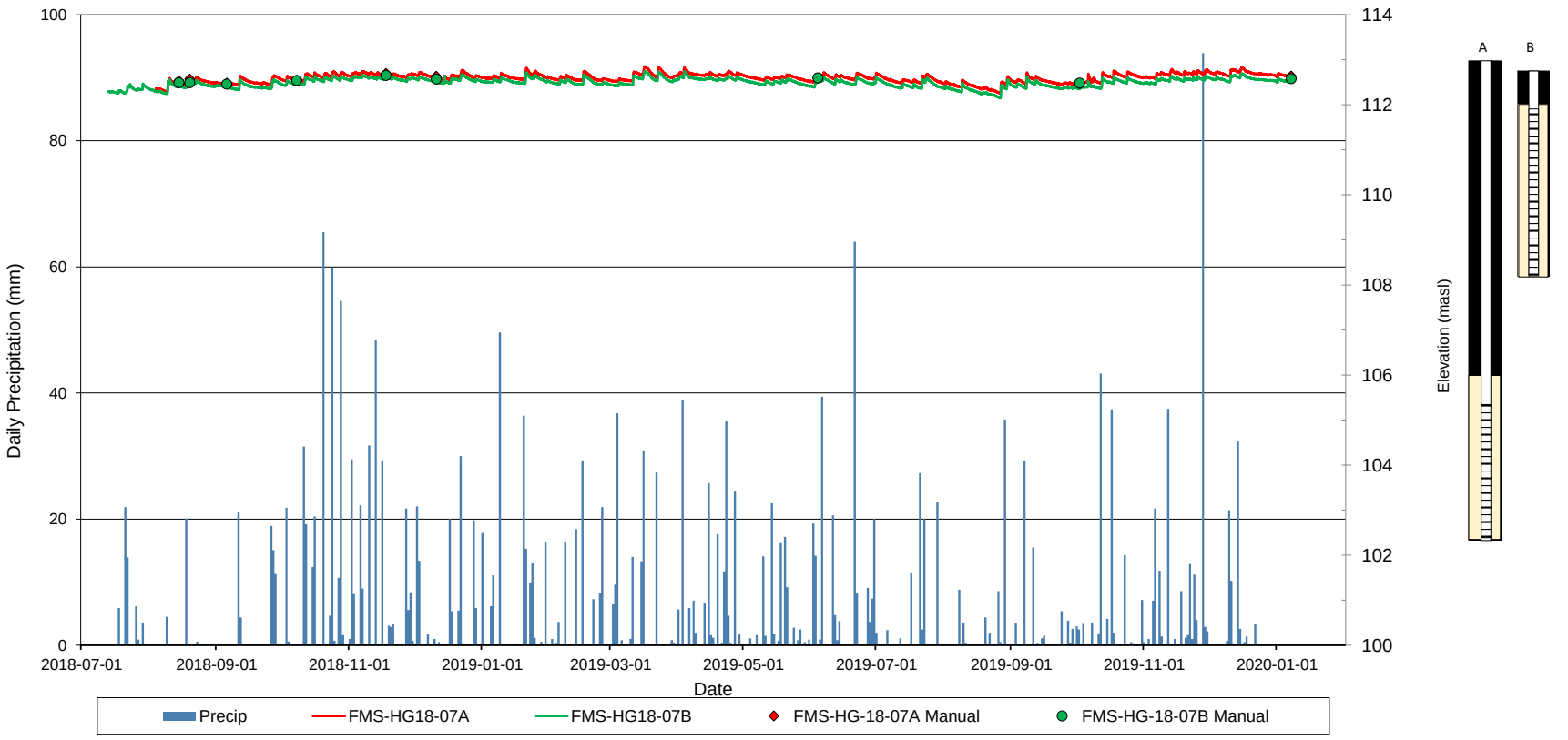
GOLDER

Prepared: CDM

Checked: PMMC

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

FIGURE 6



DATE: February 2020

PROJECT: 1895674

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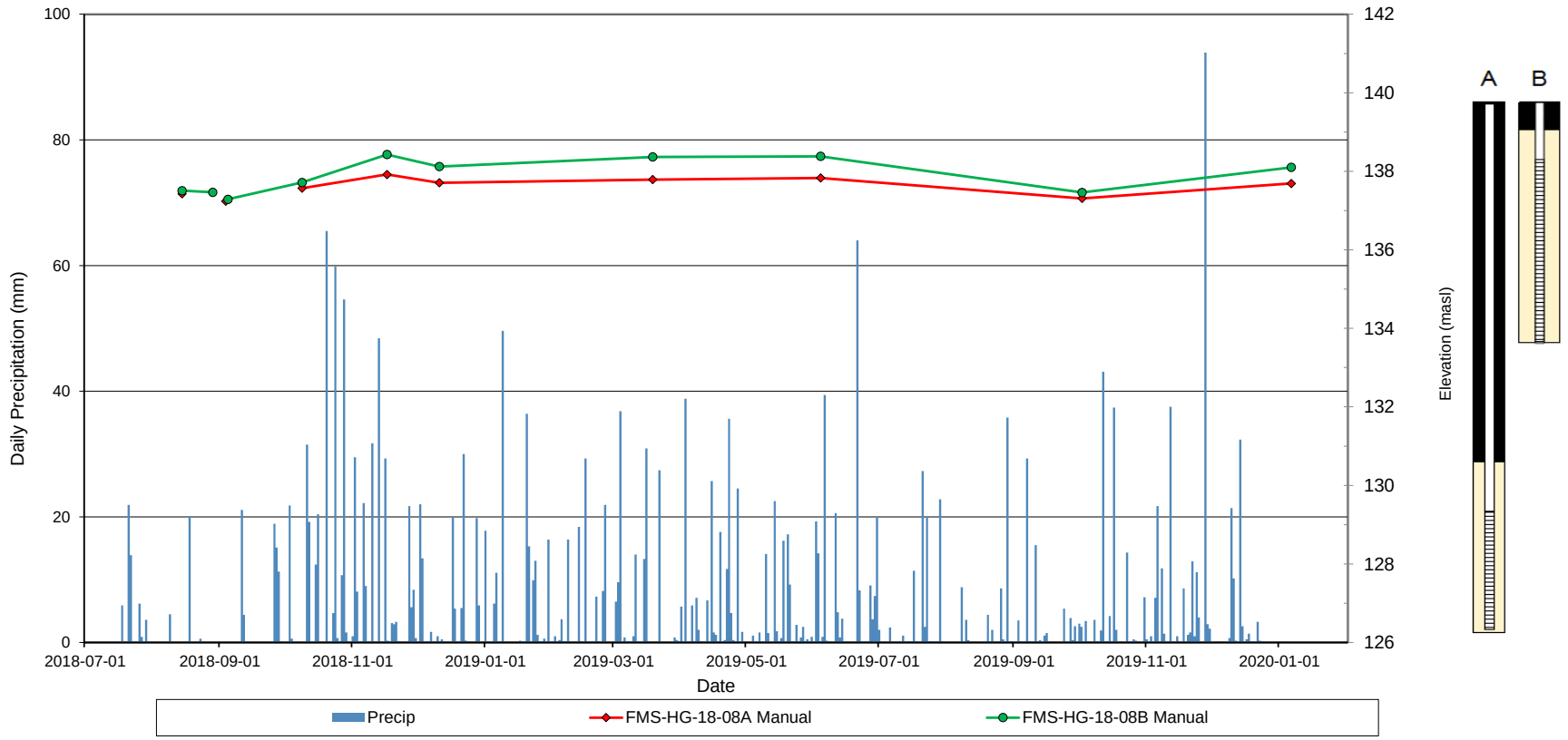
GOLDER

Prepared: CDM

Checked: PMMC

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

FIGURE 7



DATE: February 2020

PROJECT: 1895674

Note: Precipitation data from Malay Falls, NS Station, Approximately 18 km away from August 2018 to June 6, 2019 and from the Upper Stewiacke approximately 42 km away from June 7, 2019 to January 6, 2020.

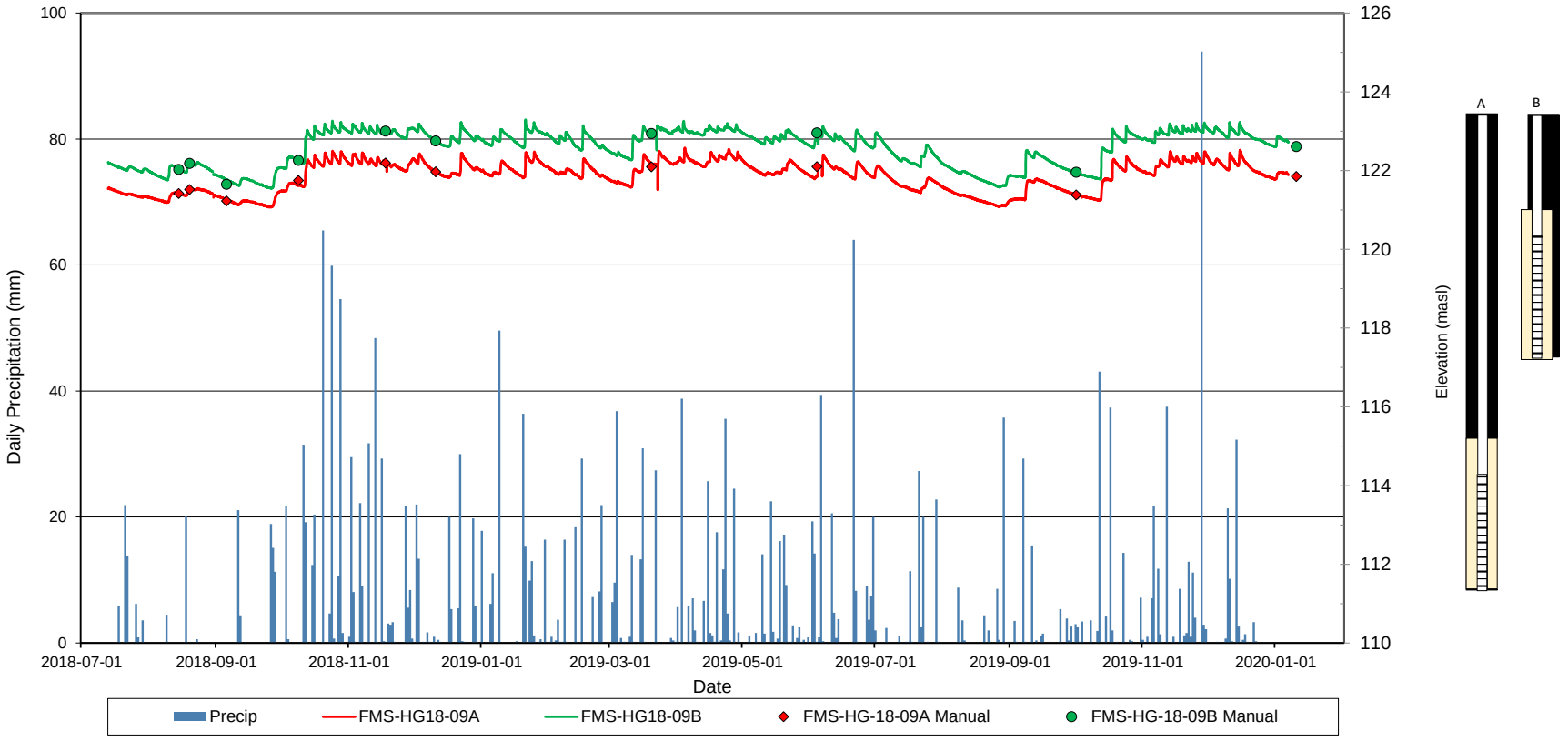
GOLDER

Prepared: CDM

Checked: PMMC

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

FIGURE 8



DATE: February 2020

PROJECT: 1895674

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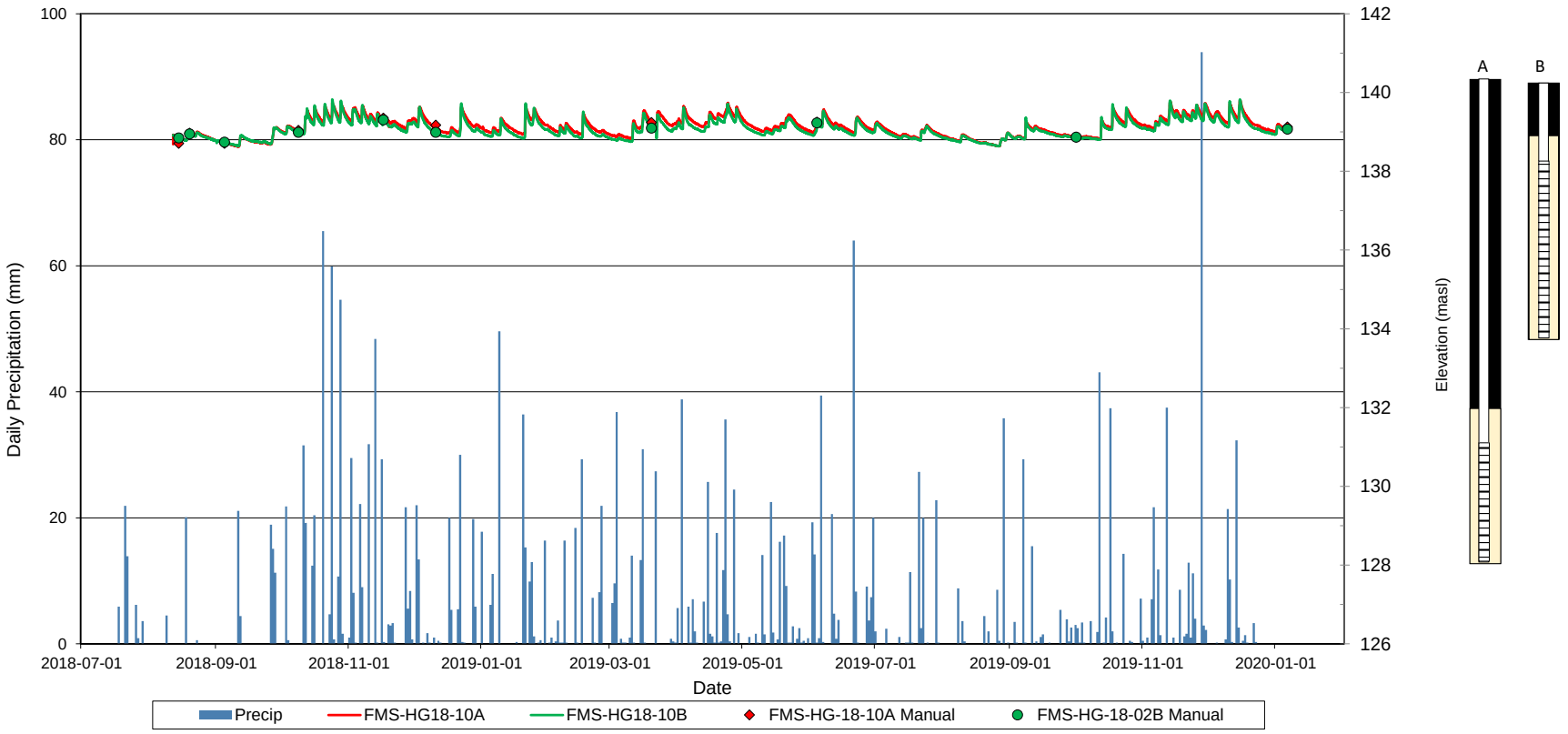
GOLDER

Prepared: CDM

Checked: PMMC

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

FIGURE 9



DATE: February 2020

PROJECT: 1895674

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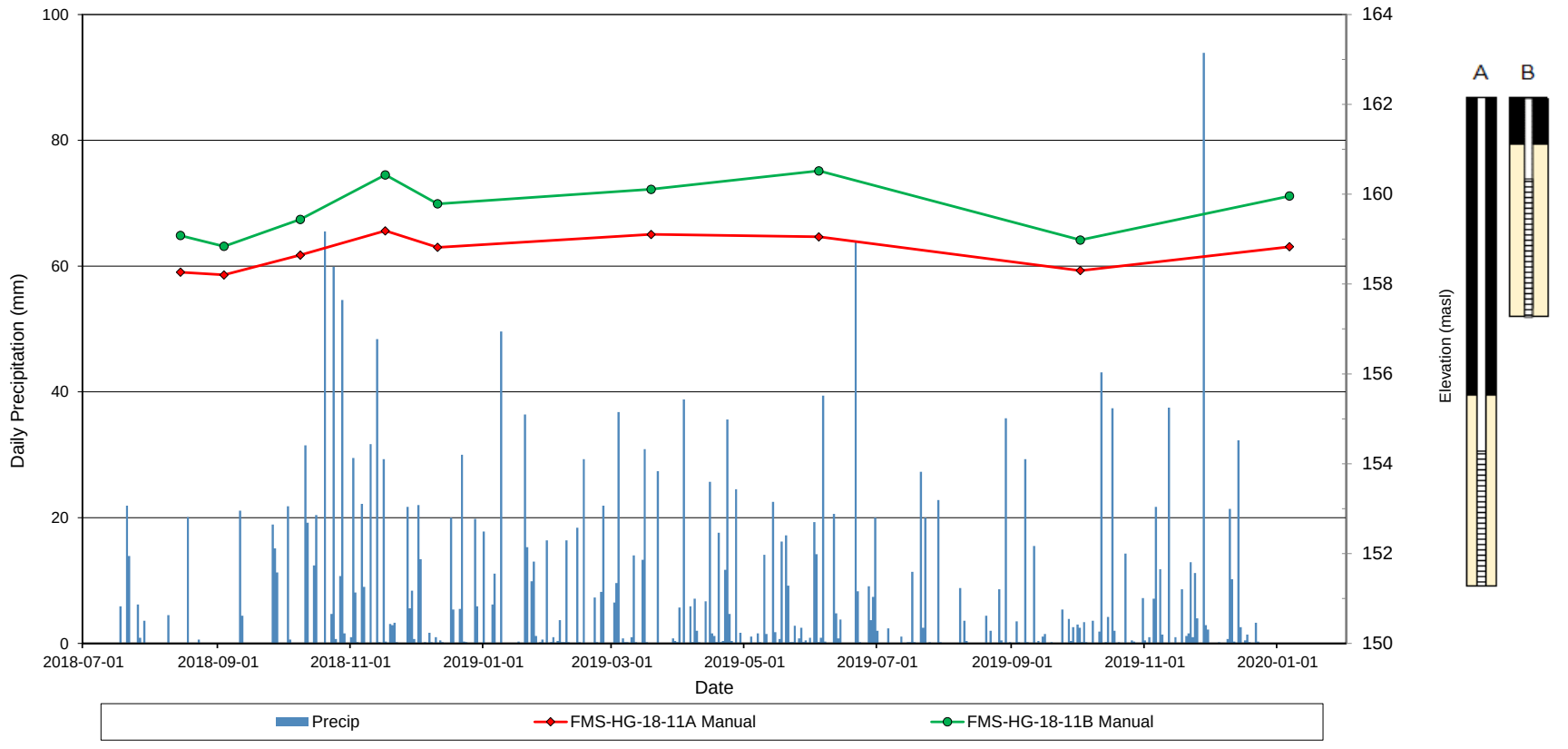
GOLDER

Prepared: CDM

Checked: PMMC

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

FIGURE 10



DATE: February 2020

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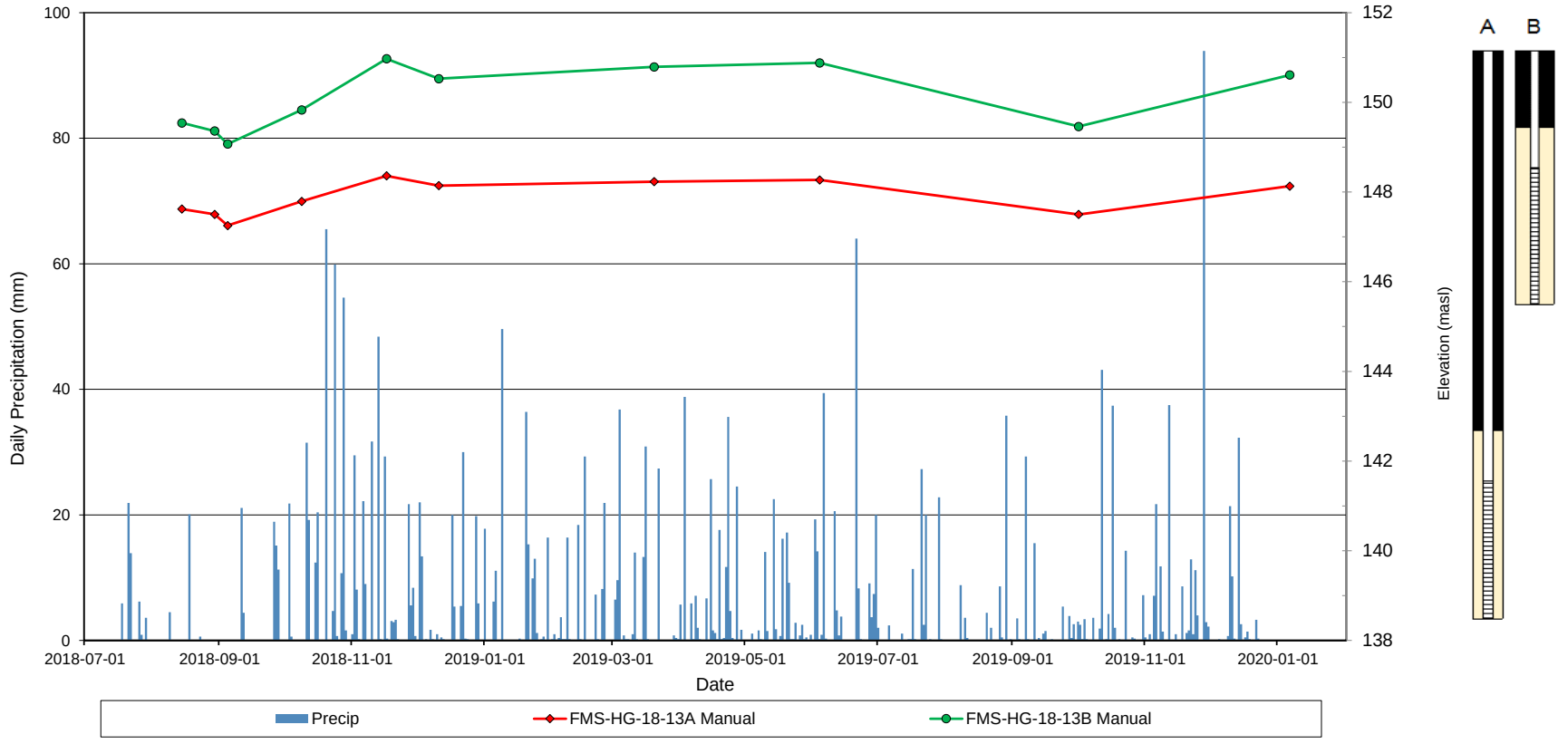
Prepared: CDM

Checked: PMMC

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

FIGURE 11



DATE: February 2020

PROJECT: 1895674

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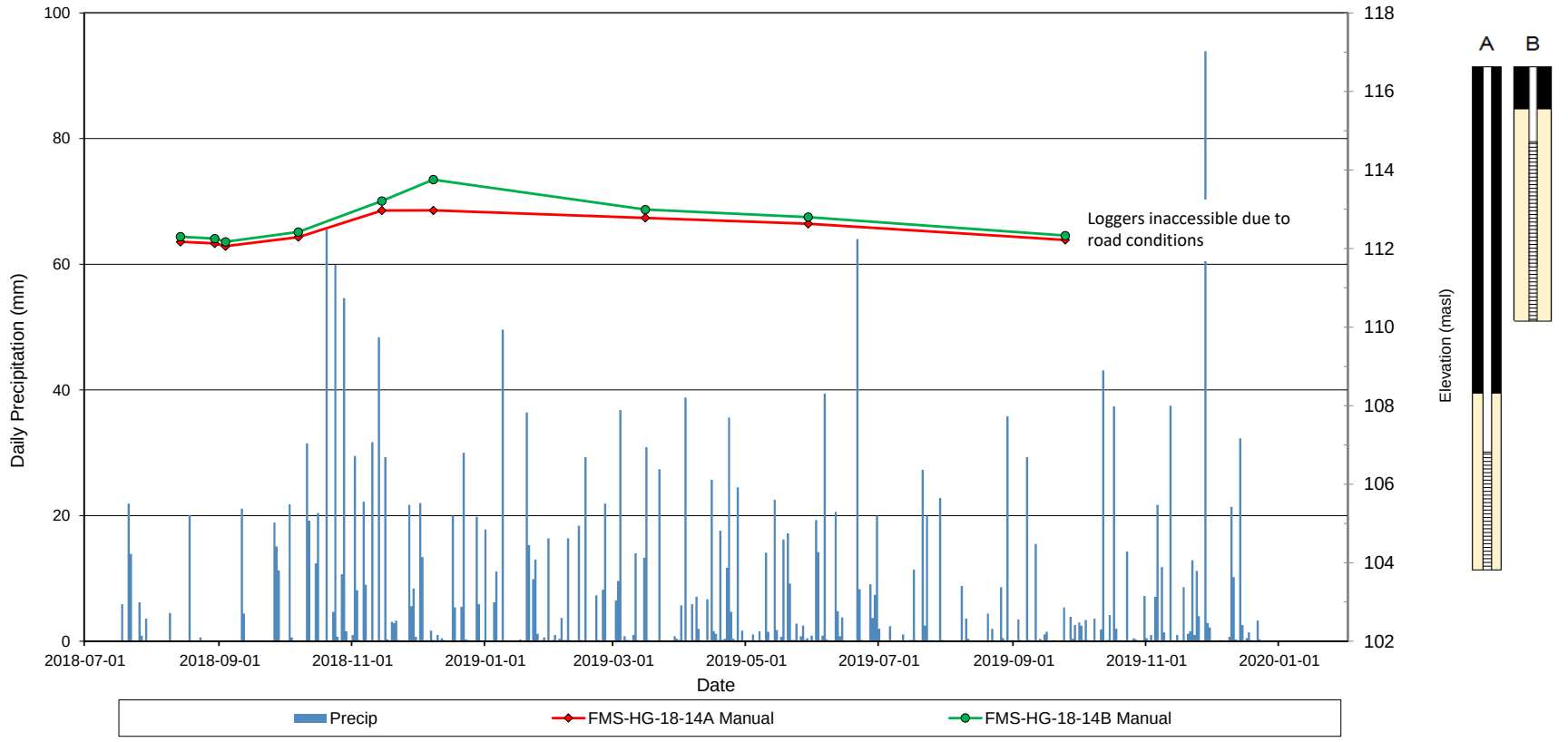
GOLDER

Prepared: CDM

Checked: PMMC

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

FIGURE 12



DATE: February 2020

PROJECT: 1895674

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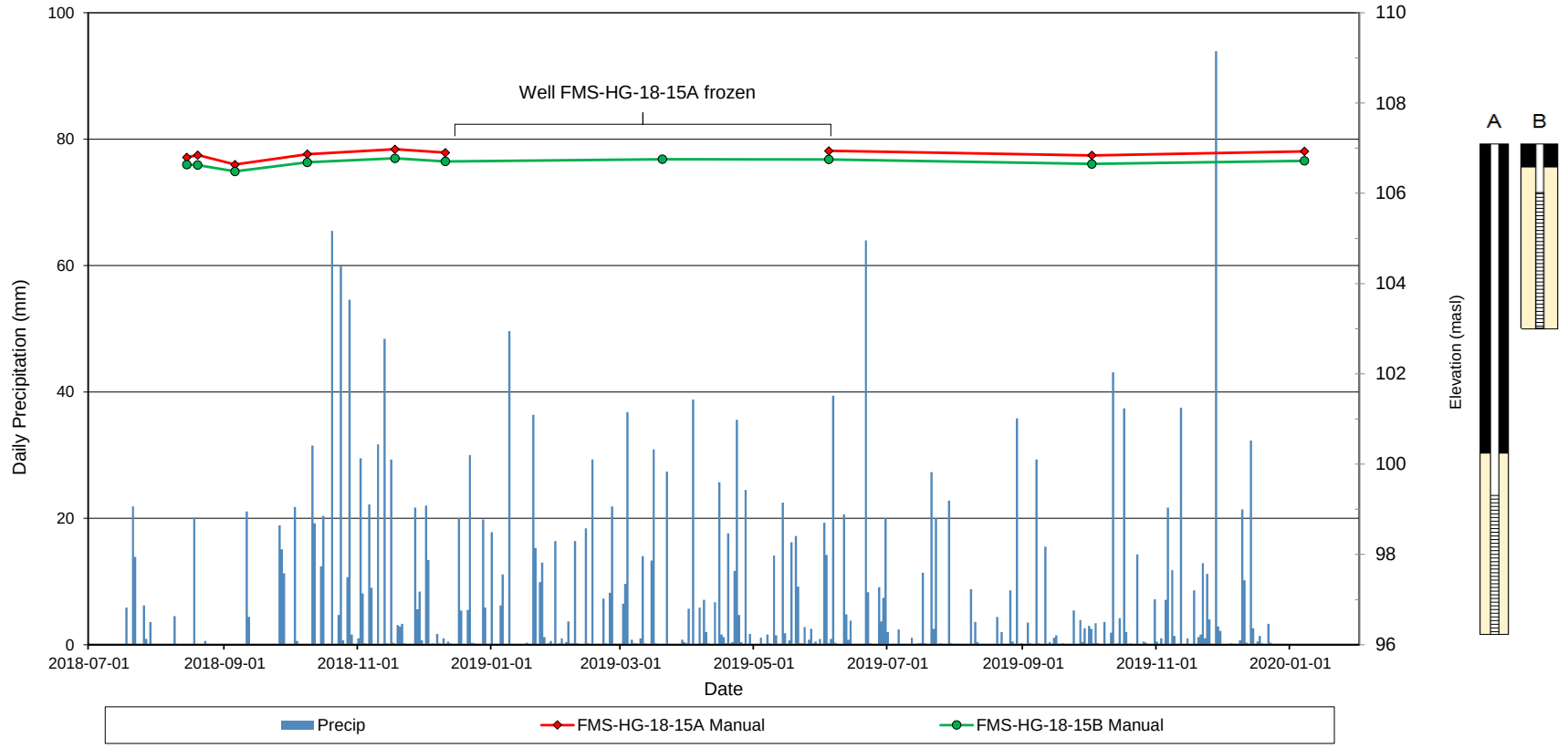
GOLDER

Prepared: CDM

Checked: PMMC

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

FIGURE 13



DATE: February 2020

PROJECT: 1895674

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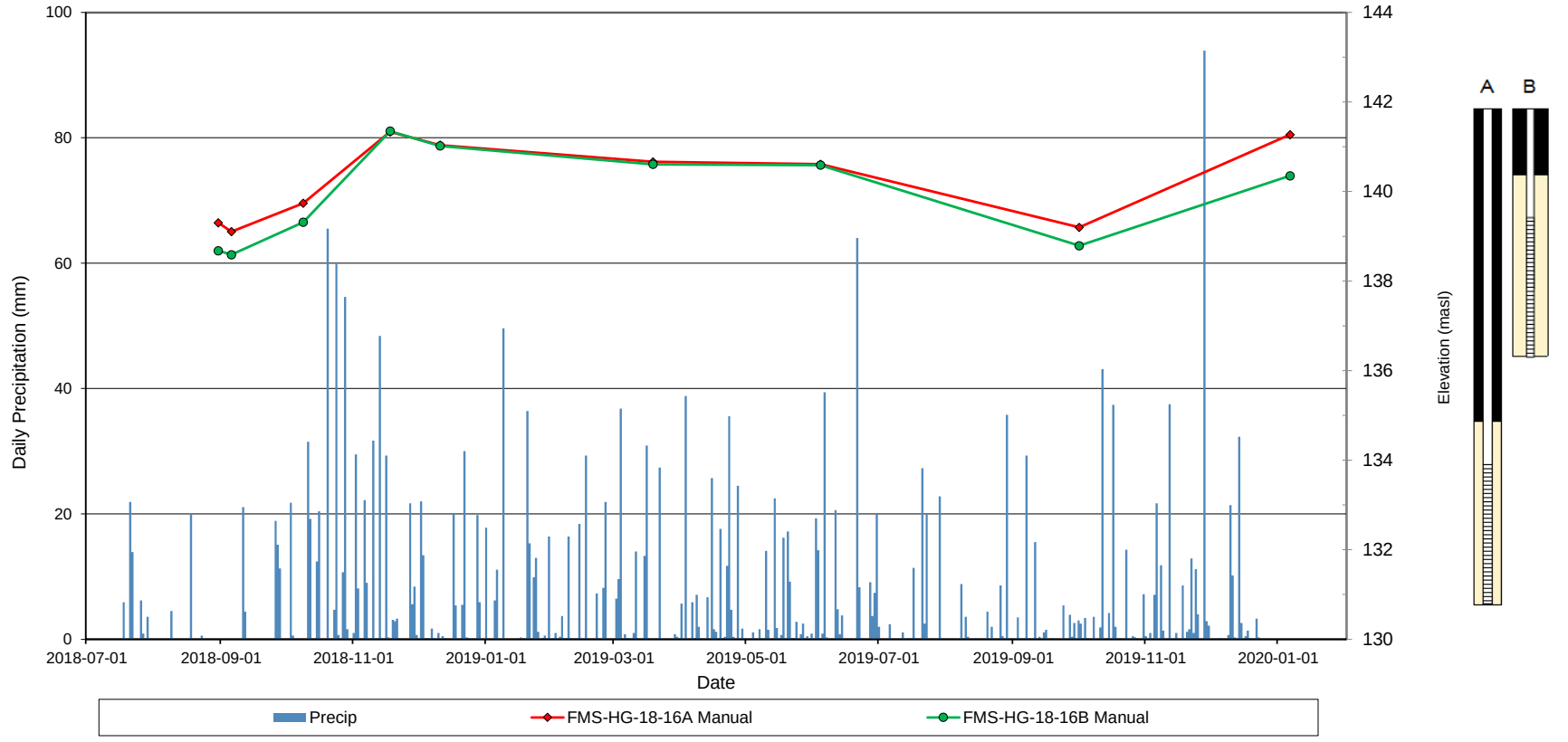
GOLDER

Prepared: CDM

Checked: PMMC

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

FIGURE 14



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GOLDER

Prepared: CDM

Checked: PMMC

APPENDIX B

Groundwater Quality

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: 20X562733

MISCELLANEOUS ANALYSIS REVIEWED BY: Jason Coughtrey, Inorganics Supervisor

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

WATER ANALYSIS REVIEWED BY: Marta Manka, Data Reporter

DATE REPORTED: Jan 22, 2020

PAGES (INCLUDING COVER): 33

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.

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: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Subcontracted Data Received

DATE RECEIVED: 2020-01-10 **DATE REPORTED: 2020-01-22**

		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:		2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-10	2020-01-10
Parameter	Unit	G / S	RDL	856220	856250	856251	856252	856253	856254	856255	856256
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:		2020-01-10	2020-01-10	2020-01-10	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-07
Parameter	Unit	G / S	RDL	856257	856258	856259	856260	856261	856262	856263	856264
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-HG18-15A	FMS-HG18-15B	FMS-HG18-16A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-07
Parameter	Unit	G / S	RDL	856265	856266	856267	856268	856269	856270	856271	856272
Subcontracted Data				y	y	y	y	y	y	y	y

		SAMPLE DESCRIPTION:		FMS-HG18-16B	DUP-A	DUP-B	DUP-C
		SAMPLE TYPE:		Water	Water	Water	Water
		DATE SAMPLED:		2020-01-07	2020-01-07	2020-01-07	2020-01-10
Parameter	Unit	G / S	RDL	856273	856274	856275	856276
Subcontracted Data				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
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TEL (902)468-8718
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Certificate of Analysis

AGAT WORK ORDER: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.1)

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

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:				2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-10	2020-01-10
Parameter	**Unit**	**G / S**	**RDL**	**856220**	**856250**	**856251**	**856252**	**856253**	**856254**	**856255**	**856256**
Benzene	mg/L	46	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	mg/L	4.2	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ethylbenzene	mg/L	3.2	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Xylene (Total)	mg/L	2.8	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
C6-C10 (less BTEX)	mg/L		0.01	<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	<0.05
>C16-C21 Hydrocarbons	mg/L		0.10	<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	<0.1
Modified TPH (Tier 1)	mg/L	13	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Resemblance Comment				NR	NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32				Y	Y	Y	Y	Y	Y	Y	Y
Surrogate	**Unit**	**Acceptable Limits**									
Isobutylbenzene - EPH	%	70-130		113	118	112	112	110	109	109	111
Isobutylbenzene - VPH	%	70-130		92	96	94	92	91	94	92	91
n-Dotriacontane - EPH	%	70-130		116	119	114	112	116	115	116	122

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
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Certificate of Analysis

AGAT WORK ORDER: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.1)

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

		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:		2020-01-10	2020-01-10	2020-01-10	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-07
Parameter	**Unit**	**G / S**	**RDL**	**856257**	**856258**	**856259**	**856260**	**856261**	**856262**	**856263**	**856264**
Benzene	mg/L	0.005	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	mg/L	0.06, 0.024	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ethylbenzene	mg/L	0.14,	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Xylene (Total)	mg/L	0.09, 0.02	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
C6-C10 (less BTEX)	mg/L		0.01	<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	<0.05
>C16-C21 Hydrocarbons	mg/L		0.10	<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	<0.1
Modified TPH (Tier 1)	mg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Resemblance Comment				NR	NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32				Y	Y	Y	Y	Y	Y	Y	Y
Surrogate	**Unit**	**Acceptable Limits**									
Isobutylbenzene - EPH	%	70-130		110	111	105	114	104	113	108	109
Isobutylbenzene - VPH	%	70-130		90	88	92	91	87	88	85	86
n-Dotriacontane - EPH	%	70-130		121	119	117	120	113	123	117	120

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: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.1)

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

		SAMPLE DESCRIPTION:		FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-15A	FMS-HG18-15B	FMS-HG18-16A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-07
Parameter	**Unit**	**G / S**	**RDL**	**856265**	**856266**	**856267**	**856268**	**856269**	**856270**	**856271**	**856272**
Benzene	mg/L	0.005	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	mg/L	0.06, 0.024	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ethylbenzene	mg/L	0.14,	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Xylene (Total)	mg/L	0.09, 0.02	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
C6-C10 (less BTEX)	mg/L		0.01	<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	<0.05
>C16-C21 Hydrocarbons	mg/L		0.10	<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	<0.1
Modified TPH (Tier 1)	mg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Resemblance Comment				NR	NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32				Y	Y	Y	Y	Y	Y	Y	Y
Surrogate	**Unit**	**Acceptable Limits**									
Isobutylbenzene - EPH	%	70-130		110	108	109	104	103	107	105	108
Isobutylbenzene - VPH	%	70-130		86	80	80	79	79	83	85	86
n-Dotriacontane - EPH	%	70-130		119	122	123	119	103	108	107	116

Certified By:

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11 Morris Drive, Unit 122
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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: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.1)

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

		SAMPLE DESCRIPTION:		FMS-HG18-16B	DUP-A	DUP-B	DUP-C
		SAMPLE TYPE:		Water	Water	Water	Water
		DATE SAMPLED:		2020-01-07	2020-01-07	2020-01-07	2020-01-10
Parameter	**Unit**	**G / S**	**RDL**	**856273**	**856274**	**856275**	**856276**
Benzene	mg/L	0.005	0.001	<0.001	<0.001	<0.001	<0.001
Toluene	mg/L	0.06, 0.024	0.001	<0.001	<0.001	<0.001	<0.001
Ethylbenzene	mg/L	0.14,	0.001	<0.001	<0.001	<0.001	<0.001
Xylene (Total)	mg/L	0.09, 0.02	0.002	<0.002	<0.002	<0.002	<0.002
C6-C10 (less BTEX)	mg/L		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
>C16-C21 Hydrocarbons	mg/L		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
Modified TPH (Tier 1)	mg/L		0.1	<0.1	<0.1	<0.1	<0.1
Resemblance Comment				NR	NR	NR	NR
Return to Baseline at C32				Y	Y	Y	Y
Surrogate	**Unit**	**Acceptable Limits**					
Isobutylbenzene - EPH	%	70-130		105	106	106	104
Isobutylbenzene - VPH	%	70-130		82	85	85	85
n-Dotriacontane - EPH	%	70-130		108	110	112	110

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to NS Contaminated Sites GW to SW >10m from SW body
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.

856220-856276 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: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Dissolved TP (Water)

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

		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:		2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-10	2020-01-10
Parameter	Unit	G / S	RDL	856220	856250	856251	856252	856253	856254	856255	856256
Total Phosphorus, Dissolved	mg/L		0.02	0.02	0.02	0.02	0.02	0.02	<0.02	0.03	<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:		2020-01-10	2020-01-10	2020-01-10	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-07
Parameter	Unit	G / S	RDL	856257	856258	856259	856260	856261	856262	856263	856264
Total Phosphorus, Dissolved	mg/L		0.02	0.02	<0.02	0.06	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-HG18-15A	FMS-HG18-15B	FMS-HG18-16A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-07
Parameter	Unit	G / S	RDL	856265	856266	856267	856268	856269	856270	856271	856272
Total Phosphorus, Dissolved	mg/L		0.02	<0.02	0.02	<0.02	0.03	<0.02	<0.02	0.02	0.02

		SAMPLE DESCRIPTION:		FMS-HG18-16B	DUP-A	DUP-B	DUP-C
		SAMPLE TYPE:		Water	Water	Water	Water
		DATE SAMPLED:		2020-01-07	2020-01-07	2020-01-07	2020-01-10
Parameter	Unit	G / S	RDL	856273	856274	856275	856276
Total Phosphorus, Dissolved	mg/L		0.02	0.02	0.02	0.02	0.02

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

Certified By: Marta Manka

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

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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: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Free & Total CN (Water)

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

		SAMPLE DESCRIPTION:		FMS-HG18-07B	FMS-HG18-15B
		SAMPLE TYPE:		Water	Water
		DATE SAMPLED:		2020-01-10	2020-01-10
Parameter	Unit	G / S	RDL	856259	856271
Cyanide, Free	mg/L		0.002	<0.002	<0.002
Total Cyanide	mg/L		0.002	<0.002	<0.002

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

Certified By: Marta Manka

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

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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: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Mercury Analysis in Water (Dissolved)

DATE RECEIVED: 2020-01-10 **DATE REPORTED: 2020-01-22**

		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:		2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-10	2020-01-10
Parameter	Unit	G / S	RDL	856220	856250	856251	856252	856253	856254	856255	856256
Dissolved Mercury	ug/L	0.26	0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016

		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:		2020-01-10	2020-01-10	2020-01-10	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-07
Parameter	Unit	G / S	RDL	856257	856258	856259	856260	856261	856262	856263	856264
Dissolved Mercury	ug/L	0.26	0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016

		SAMPLE DESCRIPTION:		FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-15A	FMS-HG18-15B	FMS-HG18-16A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-07
Parameter	Unit	G / S	RDL	856265	856266	856267	856268	856269	856270	856271	856272
Dissolved Mercury	ug/L	0.26	0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016

		SAMPLE DESCRIPTION:		FMS-HG18-16B	DUP-A	DUP-B	DUP-C
		SAMPLE TYPE:		Water	Water	Water	Water
		DATE SAMPLED:		2020-01-07	2020-01-07	2020-01-07	2020-01-10
Parameter	Unit	G / S	RDL	856273	856274	856275	856276
Dissolved Mercury	ug/L	0.26	0.016	<0.016	<0.016	<0.016	<0.016

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to NS Contaminated Sites GW to SW >10m from SW body
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: Marta Manka

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: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Mercury Analysis in Water (Total)

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

		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:		2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-10	2020-01-10
Parameter	Unit	G / S	RDL	856220	856250	856251	856252	856253	856254	856255	856256
Total Mercury	ug/L	0.26	0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016

		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:		2020-01-10	2020-01-10	2020-01-10	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-07
Parameter	Unit	G / S	RDL	856257	856258	856259	856260	856261	856262	856263	856264
Total Mercury	ug/L	0.26	0.016	<0.016	<0.016	0.026	0.021	<0.016	<0.016	<0.016	<0.016

		SAMPLE DESCRIPTION:		FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-15A	FMS-HG18-15B	FMS-HG18-16A
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-07
Parameter	Unit	G / S	RDL	856265	856266	856267	856268	856269	856270	856271	856272
Total Mercury	ug/L	0.26	0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016

		SAMPLE DESCRIPTION:		FMS-HG18-16B	DUP-A	DUP-B	DUP-C
		SAMPLE TYPE:		Water	Water	Water	Water
		DATE SAMPLED:		2020-01-07	2020-01-07	2020-01-07	2020-01-10
Parameter	Unit	G / S	RDL	856273	856274	856275	856276
Total Mercury	ug/L	0.26	0.016	<0.016	<0.016	<0.016	<0.016

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to NS Contaminated Sites GW to SW >10m from SW body
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: Marta Manka

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: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

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:				2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-10	2020-01-10
Parameter	Unit	G / S	RDL	856220	856250	856251	856252	856253	856254	856255	856256
pH				8.02	6.24	7.52	6.66	8.14	6.87	6.64	6.63
Reactive Silica as SiO2	mg/L		0.5	8.0	3.4	10.4	5.7	9.6	7.9	9.2	6.0
Chloride	mg/L		1	4	4	3	2	3	4	4	2
Fluoride	mg/L		0.12	<0.12	<0.12	<0.12	<0.12	0.21	<0.12	<0.12	<0.12
Sulphate	mg/L		2	14	<2	6	<2	6	3	3	4
Alkalinity	mg/L		5	63	<5	26	6	135	17	11	9
True Color	TCU		5	5	5	6	<5	8	<5	10	59
Turbidity	NTU		0.1	2.4	12.6	7.3	66.4	1.1	431	1.5	31.6
Electrical Conductivity	umho/cm		1	176	28	85	32	290	61	56	48
Nitrate + Nitrite as N	mg/L		0.05	<0.05	<0.05	0.11	0.23	<0.05	<0.05	0.43	0.58
Nitrate as N	mg/L		0.05	<0.05	<0.05	0.11	0.23	<0.05	<0.05	0.43	0.58
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	0.06	0.06	0.06	0.06	0.10	0.07	0.06	0.06
Total Organic Carbon	mg/L		0.5	1.2	0.6	<0.5	<0.5	1.1	<0.5	<0.5	0.7
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Dissolved Sodium	mg/L	-	0.1	5.3	2.7	5.9	2.9	36.5	4.9	2.7	4.3
Dissolved Potassium	mg/L		0.1	1.6	0.4	0.9	0.5	1.7	0.7	2.6	1.6
Dissolved Calcium	mg/L		0.1	23.1	0.8	7.5	1.9	22.9	4.6	3.5	2.4
Dissolved Magnesium	mg/L		0.1	1.9	0.4	0.5	0.3	2.8	1.1	0.7	0.4
Bicarb. Alkalinity (as CaCO3)	mg/L		5	63	<5	26	6	135	17	11	9
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L		1	88	8	40	12	154	29	25	23
Hardness	mg/L			65.5	3.6	20.8	6.0	68.7	16.0	11.6	7.6
Langelier Index (@20C)	NA			-0.40	-4.66	-1.74	-3.78	0.02	-2.77	-3.30	-3.56
Langelier Index (@ 4C)	NA			-0.72	-4.98	-2.06	-4.10	-0.30	-3.09	-3.62	-3.88
Saturation pH (@ 20C)	NA			8.42	10.9	9.26	10.4	8.12	9.64	9.94	10.2
Saturation pH (@ 4C)	NA			8.74	11.2	9.58	10.8	8.44	9.96	10.3	10.5
Anion Sum	me/L			1.66	0.11	0.74	0.19	2.91	0.52	0.43	0.36
Cation sum	me/L			1.59	0.21	0.70	0.27	3.02	0.57	0.42	0.39

Certified By: Marta Manka

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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: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

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:				2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-10	2020-01-10
Parameter	Unit	G / S	RDL	856220	856250	856251	856252	856253	856254	856255	856256
% Difference/ Ion Balance	%			2.3	30.8	2.6	15.8	1.9	5.4	0.5	3.5
Dissolved Aluminum	ug/L	50	5	<5	**60**	<5	<5	<5	<5	6	9
Dissolved Antimony	ug/L	200	2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Arsenic	ug/L	50	2	11	<2	10	<2	29	<2	12	5
Dissolved Barium	ug/L	10000	5	7	10	<5	<5	7	13	8	<5
Dissolved Beryllium	ug/L	53	2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Bismuth	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	12000	5	12	<5	<5	<5	14	<5	5	<5
Dissolved Cadmium	ug/L	0.1	0.017	<0.017	<0.017	<0.017	<0.017	<0.017	0.083	<0.017	0.019
Dissolved Chromium	ug/L	-	1	1	<1	<1	<1	2	<1	<1	<1
Dissolved Cobalt	ug/L	100	1	<1	<1	<1	<1	<1	5	<1	2
Dissolved Copper	ug/L	20	1	**24**	6	<1	4	<1	<1	4	5
Dissolved Iron	ug/L	3000	50	<50	<50	<50	<50	<50	<50	<50	<50
Dissolved Lead	ug/L	10	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dissolved Manganese	ug/L	8200	2	19	32	18	44	280	417	3	25
Dissolved Molybdenum	ug/L	730	2	<2	<2	<2	<2	8	<2	<2	<2
Dissolved Nickel	ug/L	250	2	<2	<2	<2	10	<2	9	<2	6
Dissolved Phosphorus	mg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	10	1	<1	<1	<1	<1	<1	<1	<1	<1
Dissolved Silver	ug/L	1	0.1	0.6	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Strontium	ug/L	210000	5	174	9	43	13	109	17	21	13
Dissolved Thallium	ug/L	8	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Tin	ug/L	-	2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Uranium	ug/L	3000	0.1	2.1	<0.1	0.3	<0.1	7.1	<0.1	<0.1	<0.1
Dissolved Vanadium	ug/L	60	2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Zinc	ug/L	300	5	<5	<5	<5	14	<5	92	<5	8

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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: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

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:				2020-01-10	2020-01-10	2020-01-10	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-07
Parameter	Unit	G / S	RDL	856257	856258	856259	856260	856261	856262	856263	856264
pH				6.66	7.97	6.38	7.59	6.35	7.54	6.62	7.96
Reactive Silica as SiO2	mg/L		0.5	9.6	15.4	5.4	9.2	3.5	15.0	10.5	11.8
Chloride	mg/L		1	11	5	4	3	3	5	4	4
Fluoride	mg/L		0.12	<0.12	0.15	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Sulphate	mg/L		2	17	3	2	4	<2	3	2	12
Alkalinity	mg/L		5	15	91	9	48	5	70	22	66
True Color	TCU		5	9	<5	252	<5	9	<5	11	6
Turbidity	NTU		0.1	12.3	2.0	15.9	14.7	3.0	3.3	11.5	5.1
Electrical Conductivity	umho/cm		1	131	205	47	120	31	166	67	181
Nitrate + Nitrite as N	mg/L		0.05	0.13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as N	mg/L		0.05	0.13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	0.07	0.06	0.15	0.06	0.06	0.06	0.05	0.07
Total Organic Carbon	mg/L		0.5	1.0	1.9	20.0	0.7	1.7	3.0	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	<0.01
Dissolved Sodium	mg/L	-	0.1	6.0	4.8	4.0	3.8	2.0	4.6	4.6	6.0
Dissolved Potassium	mg/L		0.1	1.6	1.8	0.5	0.6	0.5	1.3	1.0	1.2
Dissolved Calcium	mg/L		0.1	14.8	30.4	2.0	15.0	2.2	22.1	4.3	28.0
Dissolved Magnesium	mg/L		0.1	0.9	1.7	0.5	0.8	0.4	0.8	0.7	1.6
Bicarb. Alkalinity (as CaCO3)	mg/L		5	15	91	9	48	5	70	22	66
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L		1	62	102	27	56	11	79	31	93
Hardness	mg/L			40.7	82.9	7.1	40.7	7.1	58.5	13.6	76.5
Langelier Index (@20C)	NA			-2.56	-0.18	-3.90	-1.11	-4.10	-0.85	-2.94	-0.36
Langelier Index (@ 4C)	NA			-2.88	-0.50	-4.22	-1.43	-4.42	-1.17	-3.26	-0.68
Saturation pH (@ 20C)	NA			9.22	8.15	10.3	8.70	10.5	8.39	9.56	8.32
Saturation pH (@ 4C)	NA			9.54	8.47	10.6	9.02	10.8	8.71	9.88	8.64
Anion Sum	me/L			0.97	2.02	0.33	1.13	0.18	1.60	0.59	1.68
Cation sum	me/L			1.16	1.94	0.69	1.00	0.26	1.42	0.55	1.83

Certified By: Marta Manka

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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: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

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:				2020-01-10	2020-01-10	2020-01-10	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-07
Parameter	Unit	G / S	RDL	856257	856258	856259	856260	856261	856262	856263	856264
% Difference/ Ion Balance	%			8.8	2.1	34.6	6.0	16.7	6.1	3.6	4.3
Dissolved Aluminum	ug/L	50	5	12	<5	**520**	<5	**80**	<5	<5	8
Dissolved Antimony	ug/L	200	2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Arsenic	ug/L	50	2	18	16	13	2	<2	<2	<2	<2
Dissolved Barium	ug/L	10000	5	21	8	7	<5	7	12	10	6
Dissolved Beryllium	ug/L	53	2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Bismuth	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	12000	5	6	10	<5	6	<5	5	<5	18
Dissolved Cadmium	ug/L	0.1	0.017	0.084	<0.017	<0.017	<0.017	0.027	<0.017	0.030	<0.017
Dissolved Chromium	ug/L	-	1	<1	2	1	<1	<1	1	1	1
Dissolved Cobalt	ug/L	100	1	7	<1	3	<1	<1	<1	1	<1
Dissolved Copper	ug/L	20	1	<1	<1	<1	<1	<1	<1	5	2
Dissolved Iron	ug/L	3000	50	757	<50	**7730**	<50	<50	<50	1060	<50
Dissolved Lead	ug/L	10	0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dissolved Manganese	ug/L	8200	2	303	645	408	3	76	332	346	95
Dissolved Molybdenum	ug/L	730	2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Nickel	ug/L	250	2	9	<2	3	<2	3	<2	4	<2
Dissolved Phosphorus	mg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	10	1	<1	<1	<1	<1	<1	<1	<1	<1
Dissolved Silver	ug/L	1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Strontium	ug/L	210000	5	42	155	9	50	11	81	39	105
Dissolved Thallium	ug/L	8	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Tin	ug/L	-	2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L		2	<2	<2	5	<2	<2	<2	<2	<2
Dissolved Uranium	ug/L	3000	0.1	<0.1	0.5	0.1	0.3	<0.1	0.3	<0.1	0.5
Dissolved Vanadium	ug/L	60	2	<2	<2	2	<2	<2	<2	<2	<2
Dissolved Zinc	ug/L	300	5	6	<5	<5	<5	<5	<5	7	<5

Certified By: Marta Manka

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CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

SAMPLE DESCRIPTION:				FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-15A	FMS-HG18-15B	FMS-HG18-16A
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-07
Parameter	Unit	G / S	RDL	856265	856266	856267	856268	856269	856270	856271	856272
pH				6.61	6.77	6.18	6.72	5.98	7.98	7.58	7.88
Reactive Silica as SiO2	mg/L		0.5	3.9	7.7	3.6	7.6	3.6	9.8	9.0	18.4
Chloride	mg/L		1	4	5	6	3	3	3	3	4
Fluoride	mg/L		0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	0.16
Sulphate	mg/L		2	3	4	7	2	2	12	8	10
Alkalinity	mg/L		5	6	39	28	10	<5	75	47	54
True Color	TCU		5	10	12	<5	<5	5	<5	8	6
Turbidity	NTU		0.1	5.6	10.7	8.9	2.3	6.7	1.3	133	3.1
Electrical Conductivity	umho/cm		1	34	122	121	43	25	196	131	151
Nitrate + Nitrite as N	mg/L		0.05	0.07	0.84	1.47	0.12	0.06	<0.05	<0.05	<0.05
Nitrate as N	mg/L		0.05	0.07	0.66	1.47	0.12	0.06	<0.05	<0.05	<0.05
Nitrite as N	mg/L		0.05	<0.05	0.18	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	0.06	0.04	0.11	0.06	0.06	0.06	0.07	0.06
Total Organic Carbon	mg/L		0.5	<0.5	1.8	4.8	0.7	0.5	1.8	1.8	2.1
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L	-	0.1	2.6	3.9	4.4	3.1	2.2	6.1	5.0	5.2
Dissolved Potassium	mg/L		0.1	0.2	0.8	0.3	0.4	0.3	0.9	0.8	1.3
Dissolved Calcium	mg/L		0.1	2.7	13.7	1.9	3.2	1.1	31.8	20.0	20.9
Dissolved Magnesium	mg/L		0.1	0.4	1.1	1.7	0.5	0.4	1.7	1.0	1.8
Bicarb. Alkalinity (as CaCO3)	mg/L		5	6	39	28	10	<5	75	47	54
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L		1	17	58	61	19	10	101	66	76
Hardness	mg/L			8.4	38.7	11.7	10.0	4.4	86.4	54.1	59.6
Langelier Index (@20C)	NA			-3.69	-2.07	-3.66	-3.29	-4.78	-0.23	-1.02	-0.64
Langelier Index (@ 4C)	NA			-4.01	-2.39	-3.98	-3.61	-5.10	-0.55	-1.34	-0.96
Saturation pH (@ 20C)	NA			10.3	8.84	9.84	10.0	10.8	8.21	8.60	8.52
Saturation pH (@ 4C)	NA			10.6	9.16	10.2	10.3	11.1	8.53	8.92	8.84
Anion Sum	me/L			0.30	1.06	0.98	0.33	0.13	1.83	1.19	1.40
Cation sum	me/L			0.29	1.04	1.05	0.35	0.21	2.03	1.34	1.46

Certified By: Marta Manka

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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: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

SAMPLE DESCRIPTION:				FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-15A	FMS-HG18-15B	FMS-HG18-16A
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-07
Parameter	Unit	G / S	RDL	856265	856266	856267	856268	856269	856270	856271	856272
% Difference/ Ion Balance	%			0.9	1.1	3.6	2.3	23.7	5.0	5.7	2.1
Dissolved Aluminum	ug/L	50	5	37	<5	**256**	<5	**128**	5	<5	<5
Dissolved Antimony	ug/L	200	2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Arsenic	ug/L	50	2	<2	<2	<2	<2	<2	6	<2	<2
Dissolved Barium	ug/L	10000	5	<5	<5	14	<5	7	<5	7	<5
Dissolved Beryllium	ug/L	53	2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Bismuth	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	12000	5	<5	5	6	<5	6	7	5	7
Dissolved Cadmium	ug/L	0.1	0.017	<0.017	0.072	**0.199**	<0.017	<0.017	<0.017	<0.017	<0.017
Dissolved Chromium	ug/L	-	1	<1	1	2	<1	<1	1	1	1
Dissolved Cobalt	ug/L	100	1	<1	<1	21	<1	<1	<1	<1	<1
Dissolved Copper	ug/L	20	1	1	<1	3	<1	<1	<1	<1	<1
Dissolved Iron	ug/L	3000	50	<50	<50	<50	<50	<50	<50	<50	<50
Dissolved Lead	ug/L	10	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dissolved Manganese	ug/L	8200	2	10	2030	**16000**	5	31	167	308	156
Dissolved Molybdenum	ug/L	730	2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Nickel	ug/L	250	2	<2	<2	3	<2	<2	<2	2	<2
Dissolved Phosphorus	mg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	10	1	<1	<1	<1	<1	<1	<1	<1	<1
Dissolved Silver	ug/L	1	0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Dissolved Strontium	ug/L	210000	5	10	62	14	26	13	79	40	76
Dissolved Thallium	ug/L	8	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Tin	ug/L	-	2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Uranium	ug/L	3000	0.1	<0.1	0.3	<0.1	<0.1	<0.1	0.8	0.2	0.2
Dissolved Vanadium	ug/L	60	2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Zinc	ug/L	300	5	<5	<5	<5	<5	<5	<5	<5	<5

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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: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

		SAMPLE DESCRIPTION:		FMS-HG18-16B	DUP-A	DUP-B	DUP-C
		SAMPLE TYPE:		Water	Water	Water	Water
		DATE SAMPLED:		2020-01-07	2020-01-07	2020-01-07	2020-01-10
Parameter	Unit	G / S	RDL	856273	856274	856275	856276
pH				6.34	7.92	6.29	6.73
Reactive Silica as SiO2	mg/L		0.5	4.2	8.6	3.5	8.5
Chloride	mg/L		1	4	4	4	11
Fluoride	mg/L		0.12	<0.12	0.12	<0.12	<0.12
Sulphate	mg/L		2	2	13	2	18
Alkalinity	mg/L		5	<5	64	<5	15
True Color	TCU		5	7	<5	<5	5
Turbidity	NTU		0.1	4.4	2.3	15.6	11.7
Electrical Conductivity	umho/cm		1	31	178	28	134
Nitrate + Nitrite as N	mg/L		0.05	0.20	<0.05	<0.05	0.13
Nitrate as N	mg/L		0.05	0.20	<0.05	<0.05	0.13
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	0.10	0.06	0.08	0.07
Total Organic Carbon	mg/L		0.5	1.0	2.2	0.9	1.3
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L	-	0.1	3.4	5.9	2.8	6.2
Dissolved Potassium	mg/L		0.1	0.6	1.6	0.4	1.6
Dissolved Calcium	mg/L		0.1	1.0	24.7	0.8	14.1
Dissolved Magnesium	mg/L		0.1	0.5	2.1	0.4	0.9
Bicarb. Alkalinity (as CaCO3)	mg/L		5	<5	64	<5	15
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5	<5
Calculated TDS	mg/L		1	13	90	11	62
Hardness	mg/L			4.6	70.3	3.6	38.9
Langelier Index (@20C)	NA			-4.47	-0.46	-4.61	-2.51
Langelier Index (@ 4C)	NA			-4.79	-0.78	-4.93	-2.83
Saturation pH (@ 20C)	NA			10.8	8.38	10.9	9.24
Saturation pH (@ 4C)	NA			11.1	8.70	11.2	9.56
Anion Sum	me/L			0.17	1.66	0.15	0.99
Cation sum	me/L			0.30	1.71	0.22	1.13

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AGAT WORK ORDER: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

		SAMPLE DESCRIPTION:		FMS-HG18-16B	DUP-A	DUP-B	DUP-C
		SAMPLE TYPE:		Water	Water	Water	Water
		DATE SAMPLED:		2020-01-07	2020-01-07	2020-01-07	2020-01-10
Parameter	Unit	G / S	RDL	856273	856274	856275	856276
% Difference/ Ion Balance	%			27.4	1.4	17.6	6.3
Dissolved Aluminum	ug/L	50	5	**275**	5	**71**	9
Dissolved Antimony	ug/L	200	2	<2	<2	<2	<2
Dissolved Arsenic	ug/L	50	2	<2	12	<2	12
Dissolved Barium	ug/L	10000	5	15	8	11	24
Dissolved Beryllium	ug/L	53	2	<2	<2	<2	<2
Dissolved Bismuth	ug/L		2	<2	<2	<2	<2
Dissolved Boron	ug/L	12000	5	6	12	<5	7
Dissolved Cadmium	ug/L	0.1	0.017	0.029	<0.017	<0.017	0.093
Dissolved Chromium	ug/L	-	1	<1	1	<1	<1
Dissolved Cobalt	ug/L	100	1	1	<1	<1	8
Dissolved Copper	ug/L	20	1	6	**25**	6	<1
Dissolved Iron	ug/L	3000	50	<50	<50	<50	560
Dissolved Lead	ug/L	10	0.5	<0.5	<0.5	<0.5	<0.5
Dissolved Manganese	ug/L	8200	2	86	21	34	305
Dissolved Molybdenum	ug/L	730	2	<2	<2	<2	<2
Dissolved Nickel	ug/L	250	2	2	<2	<2	10
Dissolved Phosphorus	mg/L		0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Selenium	ug/L	10	1	<1	<1	<1	<1
Dissolved Silver	ug/L	1	0.1	0.3	<0.1	<0.1	<0.1
Dissolved Strontium	ug/L	210000	5	15	186	10	49
Dissolved Thallium	ug/L	8	0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Tin	ug/L	-	2	<2	<2	<2	<2
Dissolved Titanium	ug/L		2	<2	<2	<2	<2
Dissolved Uranium	ug/L	3000	0.1	<0.1	2.3	<0.1	<0.1
Dissolved Vanadium	ug/L	60	2	<2	<2	<2	<2
Dissolved Zinc	ug/L	300	5	6	<5	<5	7

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Certificate of Analysis

AGAT WORK ORDER: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to NS Contaminated Sites GW to SW >10m from SW body
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.

856220	Metals analysis completed on a filtered sample.
856250-856252	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.
856253	Metals analysis completed on a filtered sample.
856254-856256	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.
856257-856258	Metals analysis completed on a filtered sample.
856259	Metals analysis completed on a filtered sample. Ion balance is high due to high concentration of iron.
856260	Metals analysis completed on a filtered sample.
856261	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.
856262	Metals analysis completed on a filtered sample.
856263	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.
856264	Metals analysis completed on a filtered sample.
856265	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.
856266-856267	Metals analysis completed on a filtered sample.
856268-856269	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.
856270-856272	Metals analysis completed on a filtered sample.
856273	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.
856274	Metals analysis completed on a filtered sample.
856275	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.
856276	Metals analysis completed on a filtered sample.

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: Marta Manka

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CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Various Inorganics (Water)

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

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:				2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-10	2020-01-10
Parameter	Unit	G / S	RDL	856220	856250	856251	856252	856253	856254	856255	856256
Chemical Oxygen Demand	mg/L		3	5	<3	<3	4	<3	<3	6	<3
Dissolved Organic Carbon	mg/L		0.5	1.0	0.5	<0.5	<0.5	<0.5	<0.5	1.1	1.2
Total Phosphorous as P	mg/L		0.03	0.11	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	0.04
Total Suspended Solids	mg/L		5	<5	17	6	130	<5	239	<5	58

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:				2020-01-10	2020-01-10	2020-01-10	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-07
Parameter	Unit	G / S	RDL	856257	856258	856259	856260	856261	856262	856263	856264
Chemical Oxygen Demand	mg/L		3	3	3	50	<3	4	<3	<3	4
Dissolved Organic Carbon	mg/L		0.5	1.2	1.4	14.7	1.3	1.8	1.8	1.5	0.8
Total Phosphorous as P	mg/L		0.03	<0.03	<0.03	0.06	<0.03	<0.03	<0.03	0.04	<0.03
Total Suspended Solids	mg/L		5	5	<5	13	33	5	<5	6	5

SAMPLE DESCRIPTION:				FMS-HG18-10B	FMS-HG18-11A	FMS-HG18-11B	FMS-HG18-13A	FMS-HG18-13B	FMS-HG18-15A	FMS-HG18-15B	FMS-HG18-16A
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-07	2020-01-10	2020-01-10	2020-01-07
Parameter	Unit	G / S	RDL	856265	856266	856267	856268	856269	856270	856271	856272
Chemical Oxygen Demand	mg/L		3	<3	6	7	<3	<3	<3	<3	<3
Dissolved Organic Carbon	mg/L		0.5	0.6	1.8	3.4	0.9	0.5	1.2	1.4	1.9
Total Phosphorous as P	mg/L		0.03	0.08	<0.03	0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Total Suspended Solids	mg/L		5	16	26	<5	<5	13	<5	170	5

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Dartmouth, Nova Scotia
CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Various Inorganics (Water)

DATE RECEIVED: 2020-01-10

DATE REPORTED: 2020-01-22

		SAMPLE DESCRIPTION:		FMS-HG18-16B	DUP-A	DUP-B	DUP-C
		SAMPLE TYPE:		Water	Water	Water	Water
		DATE SAMPLED:		2020-01-07	2020-01-07	2020-01-07	2020-01-10
Parameter	Unit	G / S	RDL	856273	856274	856275	856276
Chemical Oxygen Demand	mg/L		3	<3	4	4	<3
Dissolved Organic Carbon	mg/L		0.5	1.0	2.5	1.0	1.0
Total Phosphorous as P	mg/L		0.03	<0.03	0.03	0.04	0.07
Total Suspended Solids	mg/L		5	7	<5	20	5

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

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: Marta Manka

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Dartmouth, Nova Scotia
CANADA B3B 1M2
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Guideline Violation

AGAT WORK ORDER: 20X562733

PROJECT: 1895674

CLIENT NAME: GOLDER ASSOCIATES

ATTENTION TO: Glen Merkley

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
856220	FMS-HG18-02A	NS-ContSiteGW_SW>10m	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	20	24
856250	FMS-HG18-02B	NS-ContSiteGW_SW>10m	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	50	60
856259	FMS-HG18-07B	NS-ContSiteGW_SW>10m	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	50	520
856259	FMS-HG18-07B	NS-ContSiteGW_SW>10m	Standard Water Analysis + Dissolved Metals	Dissolved Iron	ug/L	3000	7730
856261	FMS-HG18-08B	NS-ContSiteGW_SW>10m	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	50	80
856267	FMS-HG18-11B	NS-ContSiteGW_SW>10m	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	50	256
856267	FMS-HG18-11B	NS-ContSiteGW_SW>10m	Standard Water Analysis + Dissolved Metals	Dissolved Cadmium	ug/L	0.1	0.199
856267	FMS-HG18-11B	NS-ContSiteGW_SW>10m	Standard Water Analysis + Dissolved Metals	Dissolved Manganese	ug/L	8200	16000
856269	FMS-HG18-13B	NS-ContSiteGW_SW>10m	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	50	128
856273	FMS-HG18-16B	NS-ContSiteGW_SW>10m	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	50	275
856274	DUP-A	NS-ContSiteGW_SW>10m	Standard Water Analysis + Dissolved Metals	Dissolved Copper	ug/L	20	25
856275	DUP-B	NS-ContSiteGW_SW>10m	Standard Water Analysis + Dissolved Metals	Dissolved Aluminum	ug/L	50	71

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 20X562733

PROJECT: 1895674

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date: Jan 22, 2020			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.1)															
Benzene	1	856220	< 0.001	< 0.001	NA	< 0.001	97%	70%	130%	111%	70%	130%			
Toluene	1	856220	< 0.001	< 0.001	NA	< 0.001	94%	70%	130%	102%	70%	130%			
Ethylbenzene	1	856220	< 0.001	< 0.001	NA	< 0.001	92%	70%	130%	101%	70%	130%			
Xylene (Total)	1	856220	< 0.002	< 0.002	NA	< 0.002	93%	70%	130%	100%	70%	130%			
C6-C10 (less BTEX)	1	856220	< 0.01	< 0.01	NA	< 0.01	107%	70%	130%	128%	70%	130%	130%	70%	130%
>C10-C16 Hydrocarbons	1	TW	1.25	1.08	14.6%	< 0.05	101%	70%	130%	102%	70%	130%	104%	70%	130%
>C16-C21 Hydrocarbons	1	TW	3.80	3.33	13.2%	< 0.10	82%	70%	130%	102%	70%	130%	104%	70%	130%
>C21-C32 Hydrocarbons	1	TW	2.14	1.80	17.3%	< 0.1	94%	70%	130%	102%	70%	130%	104%	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 3.1)															
Benzene	1	859169	< 0.001	< 0.001	NA	< 0.001	82%	70%	130%	96%	70%	130%			
Toluene	1	859169	< 0.001	< 0.001	NA	< 0.001	79%	70%	130%	86%	70%	130%			
Ethylbenzene	1	859169	< 0.001	< 0.001	NA	< 0.001	78%	70%	130%	85%	70%	130%			
Xylene (Total)	1	859169	< 0.002	< 0.002	NA	< 0.002	80%	70%	130%	86%	70%	130%			
C6-C10 (less BTEX)	1	859169	0.25	0.20	22.2%	< 0.01	101%	70%	130%	120%	70%	130%	127%	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 3.1)															
>C10-C16 Hydrocarbons	1	TW	1.02	1.05	2.9%	< 0.05	102%	70%	130%	103%	70%	130%	98%	70%	130%
>C16-C21 Hydrocarbons	1	TW	3.85	4.16	7.7%	< 0.10	105%	70%	130%	103%	70%	130%	98%	70%	130%
>C21-C32 Hydrocarbons	1	TW	1.93	2.03	5.1%	< 0.1	94%	70%	130%	103%	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.

Certified By:

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 20X562733

PROJECT: 1895674

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Water Analysis

RPT Date: Jan 22, 2020			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	855278		7.84	7.82	0.3%	<	101%	80%	120%	NA	80%	120%	NA	80%	120%
Reactive Silica as SiO2	859521		9.1	10.4	13.1%	< 0.5	99%	80%	120%	96%	80%	120%	100%	80%	120%
Chloride	856220	856220	4	5	NA	< 1	111%	80%	120%	NA	80%	120%	96%	80%	120%
Fluoride	856220	856220	<0.12	0.13	NA	< 0.12	120%	80%	120%	NA	80%	120%	101%	80%	120%
Sulphate	856220	856220	14	15	4.4%	< 2	107%	80%	120%	NA	80%	120%	NA	80%	120%
Alkalinity	855278		612	616	0.7%	< 5	91%	80%	120%	NA	80%	120%	NA	80%	120%
True Color	856220	856220	5	<5	NA	< 5	95%	80%	120%	NA			NA		
Turbidity	856269	856269	6.7	6.5	3%	< 0.1	99%	80%	120%	NA			NA		
Electrical Conductivity	855278		1260	1270	0.6%	< 1	101%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrate as N	856220	856220	<0.05	<0.05	NA	< 0.05	99%	80%	120%	NA	80%	120%	81%	80%	120%
Nitrite as N	856220	856220	<0.05	<0.05	NA	< 0.05	82%	80%	120%	NA	80%	120%	114%	80%	120%
Ammonia as N	859106		0.09	0.08	NA	< 0.03	104%	80%	120%	94%	80%	120%	98%	80%	120%
Total Organic Carbon	856257	856257	1.0	1.4	NA	< 0.5	95%	80%	120%	NA	80%	120%	94%	80%	120%
Ortho-Phosphate as P	859521		0.01	0.01	NA	< 0.01	93%	80%	120%	102%	80%	120%	99%	80%	120%
Dissolved Sodium	856268	856268	3.1	3.1	2.0%	< 0.1	107%	80%	120%	108%	80%	120%	NA	70%	130%
Dissolved Potassium	856268	856268	0.4	0.4	NA	< 0.1	105%	80%	120%	106%	80%	120%	96%	70%	130%
Dissolved Calcium	856268	856268	3.2	3.1	0.9%	< 0.1	100%	80%	120%	107%	80%	120%	NA	70%	130%
Dissolved Magnesium	856268	856268	0.5	0.5	NA	< 0.1	103%	80%	120%	107%	80%	120%	83%	70%	130%
Bicarb. Alkalinity (as CaCO3)	855278		612	616	0.7%	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	855278		<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	855278		<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Dissolved Aluminum	856268	856268	<5	<5	NA	< 5	104%	80%	120%	110%	80%	120%	100%	70%	130%
Dissolved Antimony	856268	856268	<2	<2	NA	< 2	80%	80%	120%	93%	80%	120%	82%	70%	130%
Dissolved Arsenic	856268	856268	<2	<2	NA	< 2	89%	80%	120%	93%	80%	120%	87%	70%	130%
Dissolved Barium	856268	856268	<5	<5	NA	< 5	87%	80%	120%	95%	80%	120%	86%	70%	130%
Dissolved Beryllium	856268	856268	<2	<2	NA	< 2	95%	80%	120%	97%	80%	120%	99%	70%	130%
Dissolved Bismuth	856268	856268	<2	<2	NA	< 2	90%	80%	120%	105%	80%	120%	87%	70%	130%
Dissolved Boron	856268	856268	<5	<5	NA	< 5	95%	80%	120%	97%	80%	120%	98%	70%	130%
Dissolved Cadmium	856268	856268	<0.017	<0.017	NA	< 0.017	91%	80%	120%	97%	80%	120%	90%	70%	130%
Dissolved Chromium	856268	856268	<1	<1	NA	< 1	88%	80%	120%	95%	80%	120%	83%	70%	130%
Dissolved Cobalt	856268	856268	<1	<1	NA	< 1	91%	80%	120%	97%	80%	120%	90%	70%	130%
Dissolved Copper	856268	856268	<1	<1	NA	< 2	94%	80%	120%	98%	80%	120%	91%	70%	130%
Dissolved Iron	856268	856268	<50	<50	NA	< 50	89%	80%	120%	96%	80%	120%	87%	70%	130%
Dissolved Lead	856268	856268	<0.5	<0.5	NA	< 0.5	93%	80%	120%	103%	80%	120%	92%	70%	130%
Dissolved Manganese	856268	856268	5	3	NA	< 2	91%	80%	120%	95%	80%	120%	81%	70%	130%
Dissolved Molybdenum	856268	856268	<2	<2	NA	< 2	90%	80%	120%	95%	80%	120%	87%	70%	130%
Dissolved Nickel	856268	856268	<2	<2	NA	< 2	96%	80%	120%	101%	80%	120%	90%	70%	130%
Dissolved Phosphorus	856268	856268	<0.02	<0.02	NA	< 0.02	100%	80%	120%	103%	80%	120%	91%	70%	130%
Dissolved Selenium	856268	856268	<1	<1	NA	< 1	91%	80%	120%	95%	80%	120%	87%	70%	130%

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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: 20X562733

PROJECT: 1895674

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Jan 22, 2020			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	856268	856268	<0.1	<0.1	NA	< 0.1	95%	80%	120%	99%	80%	120%	93%	70%	130%
Dissolved Strontium	856268	856268	26	27	2.5%	< 5	95%	80%	120%	98%	80%	120%	NA	70%	130%
Dissolved Thallium	856268	856268	<0.1	<0.1	NA	< 0.1	95%	80%	120%	102%	80%	120%	92%	70%	130%
Dissolved Tin	856268	856268	<2	<2	NA	< 2	90%	80%	120%	99%	80%	120%	87%	70%	130%
Dissolved Titanium	856268	856268	<2	<2	NA	< 2	99%	80%	120%	104%	80%	120%	87%	70%	130%
Dissolved Uranium	856268	856268	<0.1	<0.1	NA	< 0.1	89%	80%	120%	98%	80%	120%	90%	70%	130%
Dissolved Vanadium	856268	856268	<2	<2	NA	< 2	88%	80%	120%	92%	80%	120%	85%	70%	130%
Dissolved Zinc	856268	856268	<5	<5	NA	< 5	90%	80%	120%	96%	80%	120%	91%	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	856258		<0.016	<0.016	NA	< 0.016	98%	80%	120%		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.															
Mercury Analysis in Water (Total)															
Total Mercury	856266		<0.016	0.019	NA	< 0.016	98%	80%	120%		80%	120%	100%	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	856266	856266	6	5	NA	< 3	101%	80%	120%	NA			99%	80%	120%
Dissolved Organic Carbon	853779	856257	4.1	3.4	17.0%	< 0.5	89%	80%	120%	NA	80%	120%	104%	80%	120%
Total Phosphorous as P	861233		41.4	40.0	3.4%	< 0.03	85%	80%	120%	95%	80%	120%	NA	80%	120%
Total Suspended Solids	856220	856220	<5	<5	NA	< 5	106%	80%	120%	NA			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.															
Standard Water Analysis + Dissolved Metals															
pH	856251	856251	7.52	7.49	0.4%	<	102%	80%	120%	NA	80%	120%	NA	80%	120%
Reactive Silica as SiO2	856266	856266	7.7	8.5	10.3%	< 0.5	98%	80%	120%	96%	80%	120%	105%	80%	120%
Chloride	856265	856265	4	4	NA	< 1	118%	80%	120%	NA	80%	120%	99%	80%	120%
Fluoride	856265	856265	<0.12	<0.12	NA	< 0.12	109%	80%	120%	NA	80%	120%	118%	80%	120%
Sulphate	856265	856265	3	3	NA	< 2	105%	80%	120%	NA	80%	120%	111%	80%	120%
Alkalinity	856251	856251	26	26	1.9%	< 5	93%	80%	120%	NA	80%	120%	NA	80%	120%
Electrical Conductivity	856251	856251	85	85	0.5%	< 1	102%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrate as N	856265	856265	0.07	0.07	NA	< 0.05	101%	80%	120%	NA	80%	120%	84%	80%	120%
Nitrite as N	856265	856265	<0.05	<0.05	NA	< 0.05	89%	80%	120%	NA	80%	120%	116%	80%	120%
Ammonia as N	856253	856253	0.10	0.11	NA	< 0.03	103%	80%	120%	94%	80%	120%	99%	80%	120%
Total Organic Carbon	856275	856275	0.9	0.9	NA	< 0.5	86%	80%	120%	NA	80%	120%	98%	80%	120%
Ortho-Phosphate as P	856266	856266	<0.01	<0.01	NA	< 0.01	94%	80%	120%	104%	80%	120%	101%	80%	120%
Bicarb. Alkalinity (as CaCO3)	856251	856251	26	26	1.9%	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	856251	856251	<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%

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Quality Assurance

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AGAT WORK ORDER: 20X562733

PROJECT: 1895674

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Jan 22, 2020			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
Hydroxide	856251	856251	<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															
pH	852966		7.07	7.07	0.0%	<	101%	80%	120%	NA	80%	120%	NA	80%	120%
Alkalinity	852966		8	7	NA	< 5	95%	80%	120%	NA	80%	120%	NA	80%	120%
Electrical Conductivity	852966		34	34	0.9%	< 1	104%	80%	120%	NA	80%	120%	NA	80%	120%
Ammonia as N	856273	856273	0.10	0.06	NA	< 0.03	102%	80%	120%	92%	80%	120%	102%	80%	120%
Bicarb. Alkalinity (as CaCO3)	852966		8	7	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	852966		<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	852966		<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															
Total Organic Carbon	853779		3.5	3.4	1.4%	< 0.5	89%	80%	120%	NA	80%	120%	107%	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	861299		5.8	5.5	4.3%	< 0.1	112%	80%	120%	110%	80%	120%	NA	70%	130%
Dissolved Potassium	861299		1.8	1.8	1.5%	< 0.1	114%	80%	120%	111%	80%	120%	NA	70%	130%
Dissolved Calcium	861299		45.0	52.9	16.1%	< 0.1	117%	80%	120%	108%	80%	120%	NA	70%	130%
Dissolved Magnesium	861299		11.5	13.0	12.4%	< 0.1	114%	80%	120%	107%	80%	120%	NA	70%	130%
Dissolved Aluminum	861299		<5	<5	NA	< 5	118%	80%	120%	106%	80%	120%	88%	70%	130%
Dissolved Antimony	861299		<2	<2	NA	< 2	88%	80%	120%	93%	80%	120%	89%	70%	130%
Dissolved Arsenic	861299		<2	<2	NA	< 2	104%	80%	120%	101%	80%	120%	100%	70%	130%
Dissolved Barium	861299		79	77	3.2%	< 5	100%	80%	120%	95%	80%	120%	NA	70%	130%
Dissolved Beryllium	861299		<2	<2	NA	< 2	117%	80%	120%	108%	80%	120%	99%	70%	130%
Dissolved Bismuth	861299		<2	<2	NA	< 2	107%	80%	120%	109%	80%	120%	86%	70%	130%
Dissolved Boron	861299		20	20	NA	< 5	117%	80%	120%	109%	80%	120%	98%	70%	130%
Dissolved Cadmium	861299		<0.017	<0.017	NA	< 0.017	101%	80%	120%	95%	80%	120%	96%	70%	130%
Dissolved Chromium	861299		2	2	NA	< 1	106%	80%	120%	99%	80%	120%	90%	70%	130%
Dissolved Cobalt	861299		<1	<1	NA	< 1	107%	80%	120%	100%	80%	120%	96%	70%	130%
Dissolved Copper	861299		3	3	NA	< 2	110%	80%	120%	100%	80%	120%	96%	70%	130%
Dissolved Iron	861299		<50	<50	NA	< 50	108%	80%	120%	100%	80%	120%	95%	70%	130%
Dissolved Lead	861299		<0.5	<0.5	NA	< 0.5	113%	80%	120%	108%	80%	120%	97%	70%	130%
Dissolved Manganese	861299		16	16	0.9%	< 2	108%	80%	120%	99%	80%	120%	NA	70%	130%
Dissolved Molybdenum	861299		<2	<2	NA	< 2	107%	80%	120%	99%	80%	120%	90%	70%	130%
Dissolved Nickel	861299		2	2	NA	< 2	108%	80%	120%	102%	80%	120%	95%	70%	130%
Dissolved Phosphorus	861299		<0.02	<0.02	NA	< 0.02	118%	80%	120%	114%	80%	120%	81%	70%	130%
Dissolved Selenium	861299		<1	<1	NA	< 1	111%	80%	120%	108%	80%	120%	100%	70%	130%

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 20X562733

PROJECT: 1895674

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Jan 22, 2020			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	861299		<0.1	<0.1	NA	< 0.1	110%	80%	120%	99%	80%	120%	89%	70%	130%
Dissolved Strontium	861299		142	138	3.0%	< 5	115%	80%	120%	105%	80%	120%	NA	70%	130%
Dissolved Thallium	861299		<0.1	<0.1	NA	< 0.1	112%	80%	120%	108%	80%	120%	98%	70%	130%
Dissolved Tin	861299		<2	<2	NA	< 2	98%	80%	120%	95%	80%	120%	92%	70%	130%
Dissolved Titanium	861299		<2	<2	NA	< 2	113%	80%	120%	105%	80%	120%	89%	70%	130%
Dissolved Uranium	861299		0.5	0.5	NA	< 0.1	112%	80%	120%	106%	80%	120%	98%	70%	130%
Dissolved Vanadium	861299		<2	<2	NA	< 2	106%	80%	120%	97%	80%	120%	97%	70%	130%
Dissolved Zinc	861299		6	6	NA	< 5	105%	80%	120%	98%	80%	120%	97%	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)															
Dissolved Organic Carbon	856275	856275	1.0	0.9	NA	< 0.5	86%	80%	120%	NA	80%	120%	98%	80%	120%
Total Phosphorous as P	856264	856264	<0.03	<0.03	NA	< 0.03	86%	80%	120%	92%	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.															
Dissolved TP (Water)															
Total Phosphorus, Dissolved	856220	856220	0.02	0.02	NA	< 0.02	96%	90%	110%	98%	90%	110%	101%	80%	120%
Dissolved TP (Water)															
Total Phosphorus, Dissolved	856269	856269	<0.02	<0.02	NA	< 0.02	98%	90%	110%	95%	90%	110%	92%	80%	120%
Free & Total CN (Water)															
Cyanide, Free	862624		<0.002	<0.002	NA	< 0.002	100%	90%	110%	100%	90%	110%	88%	70%	130%
Total Cyanide	860523		<0.002	<0.002	NA	< 0.002	107%	80%	120%	101%	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: Marta Manka

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 20X562733

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

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

Method Summary

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 20X562733

PROJECT: 1895674

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Total Phosphorus, Dissolved	INOR-93-6022	SM 4500-P B&E	SPECTROPHOTOMETER
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 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
Total Organic Carbon	INOR-121-6026	SM 5310 B	TOC ANALYZER
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

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

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TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES

AGAT WORK ORDER: 20X562733

PROJECT: 1895674

ATTENTION TO: Glen Merkley

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
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
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	INOR-121-6046	SM 4500-P H, EPA 365.4	COLORIMETER
Total Suspended Solids	INOR-121-6024, 6025	SM 2540C, D	GRAVIMETRIC

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

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: 3.8, 4.5, 5.7
Hold Time:
AGAT Job Number: 20X 562733
Notes: Coolers, ice

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 Samples 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:

Regulatory Requirements (Check):

☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Tier 2 ☐ Gas ☐ Res ☐ Com ☐ Fuel ☐ Lube ☐ Pot ☐ N/Pot ☐ Coarse ☐ Fine
☐ 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.:

Invoice To

Same Yes ☑ / No ☐

Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

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~~ 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-HG18-02A	Jan 7/20 - 8:33	GW	14	Field filtered for all preserved samples ↓		☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-02B	Jan 7/20 - 8:33	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-03A	Jan 7/20 - 10:17	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-03B	Jan 7/20 - 10:17	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-04A	Jan 10/20 - 11:43	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-04B	Jan 10/20 - 11:43	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-05A	Jan 10/20 - 10:06	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-05B	Jan 10/20 - 10:06	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-06A	Jan 10/20 - 9:24	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-07A	Jan 10/20 - 8:44	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-07B	Jan 10/20 - 8:44	GW	15			☑	☑	☑	✓		☑		☑		☑											☑	☑	
FMS-HG18-08A	Jan 7/20 - 14:19	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	

Samples Relinquished By (Print Name): Courtney OBrien
Date/Time: Jan 10/20 15:40
Samples Relinquished By (Sign): COBrien
Date/Time:
Samples Received By (Print Name): [illegible]
Date/Time: Jan 10
Samples Received By (Sign): [illegible]
Date/Time: 15:40

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

Page 1 of 3

Nº:

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

Document ID: DIV-133-1502.002

Date revised: May 19, 2016

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: 20x562733
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 Samples 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 ☐ 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-HG18-08B	Jan 7/20 - 14:19	GW	14	Field filtered for all preserved samples		☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-09A	Jan 10/20 - 8:11	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-09B	Jan 10/20 - 8:11	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-10A	Jan 7/20 - 12:45	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-10B	Jan 7/20 - 12:45	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-11A	Jan 7/20 - 13:40	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-11B	Jan 7/20 - 13:40	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-13A	Jan 7/20 - 12:08	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-13B	Jan 7/20 - 12:08	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-15A	Jan 10/20 - 11:06	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	
FMS-HG18-15B	Jan 10/20 - 11:06	GW	15			☑	☑	☑	✓		☑		☑		☑											☑	☑	
FMS-HG18-16A	Jan 7/20 - 11:21	GW	14			☑	☑	☑	✓		☑		☑		☑												☑	

Samples Relinquished By (Print Name):	Date/Time	Samples Received By (Print Name):	Date/Time
Courtney O'Brien	Jan 10/20 15:40		Jan 10
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: DIV-133-1502.002

Date revised: May 19, 2016

Copper RDL- 1.0 Mg/L ; Mercury RDL- 0.016 MG/L

AGAT Laboratories

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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: 20x562733
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 Samples 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-HG18-16B	Jan 7/20 - 11:21	GW	14	Field filtered for all preserved samples
DUP-A	Jan 7/20 - 8:33	GW	14	
DUP-B	Jan 7/20 - 8:33	GW	14	
DUP-C	Jan 10/20 - 9:24	GW	14	

Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☑ Diss ☐ Available	Mercury (total + Diss.)	☐ BOD ☐ CBOD 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)
	☑	☑	☑	✓		☑		☑		☑												☑	
	☑	☑	☑	✓		☑		☑		☑												☑	
	☑	☑	☑	✓		☑		☑		☑												☑	
	☑	☑	☑	✓		☑		☑		☑												☑	

Samples Relinquished By (Print Name):	Date/Time	Samples Received By (Print Name):	Date/Time
Courtney OBrien	Jan 10/20 13:40		Jan 10
Samples Relinquished By (Sign):	**Date/Time**	**Samples Received By (Sign):**	**Date/Time**
			15:40

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

Page 3 of 3
N°:

Document ID: DIV-133-1502.002

Date revised: May 19, 2016

Copper RDL - 1.0 Mg/L, Mercury RDL - 0.016 Mg/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 # 2020-475

Jan 21, 2020

AGAT Laboratories
122-11 Morris Drive
Dartmouth, NS B3B 1M2
Attn: Mohammed Hasanat

Date Samples Received: Jan-14-2020 Client P.O.: 152994

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 Section 4 authorized by Vicky Snook, 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.

* Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

This is a final report.

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 # 2020-475

Jan 21, 2020

AGAT Laboratories

122-11 Morris Drive
Dartmouth, NS B3B 1M2
Attn: Mohammed Hasanat

Date Samples Received: Jan-14-2020 Client P.O.: 152994

3491	**20X562733 - 856220 - FMS-HG18-02A *WATER***
3492	**20X562733 - 856250 - FMS-HG18-02B *WATER***
3493	**20X562733 - 856251 - FMS-HG18-03A *WATER***

Analyte	Units	3491	3492	3493
Lab Section 4				
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 3.3 °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

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SRC Group # 2020-475

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AGAT Laboratories

3494	**20X562733 - 856252 - FMS-HG18-03B *WATER***
3495	**20X562733 - 856253 - FMS-HG18-04A *WATER***
3496	**20X562733 - 856254 - FMS-HG18-04B *WATER***

Analyte	Units	3494	3495	3496
Lab Section 4				
Radium-226	Bq/L	<0.005	0.006	0.006

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3497	**20X562733 - 856255 - FMS-HG18-05A *WATER***
3498	**20X562733 - 856256 - FMS-HG18-05B *WATER***
3499	**20X562733 - 856257 - FMS-HG18-06A *WATER***

Analyte	Units	3497	3498	3499
Lab Section 4				
Radium-226	Bq/L	<0.005	0.01	0.02

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3500	**20X562733 - 856258 - FMS-HG18-07A *WATER***
3501	**20X562733 - 856259 - FMS-HG18-07B *WATER***
3502	**20X562733 - 856260 - FMS-HG18-08A *WATER***

Analyte	Units	3500	3501	3502
Lab Section 4				
Radium-226	Bq/L	0.02	0.03	<0.005

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3503	**20X562733 - 856261 - FMS-HG18-08B *WATER***
3504	**20X562733 - 856262 - FMS-HG18-09A *WATER***
3505	**20X562733 - 856263 - FMS-HG18-09B *WATER***

Analyte	Units	3503	3504	3505
Lab Section 4				
Radium-226	Bq/L	0.007	0.03	0.006

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3506	**20X562733 - 856264 - FMS-HG18-010A *WATER***
3507	**20X562733 - 856265 - FMS-HG18-010B *WATER***
3508	**20X562733 - 856266 - FMS-HG18-011A *WATER***

Analyte	Units	3506	3507	3508
Lab Section 4				
Radium-226	Bq/L	<0.005	<0.005	<0.005

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3509	**20X562733 - 856267 - FMS-HG18-011B *WATER***
3510	**20X562733 - 856268 - FMS-HG18-013A *WATER***
3511	**20X562733 - 856269 - FMS-HG18-013B *WATER***

Analyte	Units	3509	3510	3511
Lab Section 4				
Radium-226	Bq/L	0.006	<0.005	<0.005

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3512	**20X562733 - 856270 - FMS-HG18-015A *WATER***
3513	**20X562733 - 856271 - FMS-HG18-015B *WATER***
3514	**20X562733 - 856272 - FMS-HG18-016A *WATER***

Analyte	Units	3512	3513	3514
Lab Section 4				
Radium-226	Bq/L	0.01	<0.005	0.01

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3515	**20X562733 - 856273 - FMS-HG18-016B *WATER***
3516	**20X562733 - 856274 - DUP-A *WATER***
3517	**20X562733 - 856275 - DUP-B *WATER***

Analyte	Units	3515	3516	3517
Lab Section 4				
Radium-226	Bq/L	<0.005	0.005	<0.005

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3518 **20X562733 - 856276 - DUP-C *WATER***

Analyte	Units	3518
Lab Section 4		
Radium-226	Bq/L	0.02

The temperature of the cooler was 3.3 °C upon receipt.