Baffinland Iron Mines Corporation
Mary River Expansion Project

2016-2017-2018 Rail Geotechnical Investigation Factual Data Report

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Document Number Explanation

This report was issued for client review as Rev. B on March 13th, 2018 under the following document number: H352034-1000-229-230-0005. Subsequently, there are 2 additional boreholes drilled at each of the three proposed bridges at KM 16, KM 71, and KM 102 in addition to the 3 boreholes drilled for the proposed bridge at KM 86 presented in revision 1. As a result of this additional information, the document number was revised to H353004-10000-229-230-0005. Although the current project number (H353004) was used to report the new data (borehole reports, test reports, etc.), the former project number (H352034) is still shown on the borehole reports/data sheets from previous investigations.

DISCLAIMER

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This report is meant to be read, and sections should not be read or relied upon out of context. While it is believed that the information contained herein is reliable under the conditions and subject to the limitations set forth herein, this Report is based in part on information not within the control of Hatch and Hatch therefore cannot and does not guarantee the accuracy of such information based in whole or in part on information not within the control of Hatch. The comments in it reflect Hatch's professional judgment in light of the information available to it at the time of preparation.

This report contains the expression of the professional opinion of Hatch exercising reasonable care, skill and judgment and based upon information available at the time of preparation. Hatch has conducted this investigation in accordance with the methodology outlined herein. It is important to note that the methods of evaluation employed, while aimed at minimizing the risk of unidentified problems, cannot guarantee their absence. The quality of the information, conclusions and estimates contained herein is consistent with the intended level of accuracy as set out in this report, as well as the circumstances and constraints under which this report was prepared.

Client's Signature:

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Table of Contents

List of Tables

List of Figures

List of Appendices

1. Introduction

Baffinland Iron Mines Corporation (BIM) currently operates the Mary River iron ore mine in Nunavut, Canada. BIM plans to increase the production to 12 Mtpa, shipping the output through Milne Port. This will be achieved by upgrading the mine fleet, constructing an approximately 110 km long rail line from the mine site to the port, building a new crushing and screening facility at the port, construction of larger ore stockpiles and building a second ore dock for ship loading.

Hatch Ltd. (Hatch) was retained by BIM to conduct geotechnical drilling investigations for the design of a railway alignment spanning from Milne Port to the Mine Site. The drilling program included three phases; the first phase was executed from September 28 to December 14, 2016, the second phase was executed between April 9, 2017 and May 2, 2017, and the third phase was executed between March 2, 2018 and April 19, 2018.

This report presents (i) sonic borehole data including the visual observations and laboratory test results for particle size distribution and soil behaviour type and (ii) geophysics data including ground-penetrating radar and refractive seismic lines. In addition, sample photographs are appended providing visual records of soil cores.

1.1 Previous Investigations

Geotechnical investigation programs have previously been conducted at the Mary River mine site, Steensby Inlet port structure, the Milne Inlet port site, the Tote Road from the mine site to Milne Port site, along a proposed southern railway alignment from Mary River and Steensby Inlet, as well as offshore investigations at Milne Port.

These previous programs were conducted in 2006, 2007, and 2008 by Knight Piésold Consulting Ltd. (Knight Piésold), in 2010 by AMEC Earth and Environmental (AMEC), and in 2011 and 2013 by Hatch. Select information from those investigations has been incorporated in this report.

1.2 Local Topology and Geology

The approximately 110 km proposed rail line starts at Milne Port (Km 0) and passes through approximately 20 km of Precambrian bedrock terrain, glaciofluvial sand and gravel terraces. Further south, the rail alignment spans across a relatively flat lying ground comprising fine grained glacial till veneer overlying Paleozoic rocks mainly dolomitic limestone units for approximately 60 km. The final stretch of the rail alignment traverses glaciolacustrine and glaciofluvial plains, terraces, eskers and bedrock outcrops ranging from granitic gneiss to sedimentary rocks. For detailed maps showing the geology along the rail alignment please refer to the Site Assessment of North Railway Alignment Report (H352034-1000-220-068-0001).

2. Geotechnical Investigation

2.1 General

The drilling supervision, field core logging and sampling associated with the railway drilling program was carried out by Hatch. Boart Longyear Ltd. (Boart Longyear) was selected as the drilling contractor. The field program was divided into three phases, the first phase (2016 investigation) was executed from September 28 to December 14, 2016, the second phase (2017 investigation) was executed between April 9 to May 2, 2017, and the third phase (2018 investigation) was executed between March 2, 2018 and April 19, 2018.

A total of 98 boreholes were drilled during the 2016 geotechnical investigation program, ranging from a depth of 1.5 m to 30 m. There were 81 boreholes drilled along the proposed rail alignment, 12 boreholes drilled at the proposed bridge abutments, and 5 boreholes drilled at the proposed quarry locations. These boreholes excluded the ones associated with Milne Port infrastructure.

A total of 14 boreholes were drilled during the early 2017 geotechnical investigation program ranging from a depth of 4.6 m to 25.9 m. Out of these 14 boreholes, 12 boreholes were drilled along the proposed rail alignment, and 2 boreholes were drilled at the proposed bridge abutments.

A total of 3 additional boreholes (BH17-BR86-1, -2, -3) were drilled at the Bridge at Km 86 location during the late 2017 geotechnical investigation program. The boreholes were drilled to a final depth of 39.6 m each.

A total of 6 boreholes were drilled during the 2018 geotechnical investigation program at three proposed bridge abutment locations, excluding boreholes associated with Milne Port Infrastructure. The depths of the boreholes ranged from 11.5 m to 32.5 m.

These boreholes provide data regarding overburden depth, soil type, ground ice and type of bedrock. Approximately 600 samples were collected on site and shipped to the Hatch geotechnical laboratory in Niagara Falls. Representative samples were selected for further laboratory testing.

As part of the 2017 and 2018 drilling program, geophysics work was undertaken along the rail alignment which included refractive seismic surveys and ground-penetrating radar. The geophysics work was undertaken by GPR Geophysics Inc. (GPR Inc.) while field supervision was provided by Hatch.

The focus of this report is the rail alignment portion of the investigation, which includes the boreholes that were drilled along the rail alignment, the bridge abutments and proposed quarry sites, and results from the geophysics surveys that were performed along the rail alignment.

2.2 Borehole Locations

A summary of the as-drilled borehole locations for the rail alignment, bridge abutments and potential quarries is presented in Table 2-1 through Table 2-3. All coordinates are located within Zone 17 of the Universal Transverse Mercator (UTM) Grid. The coordinates were recorded using a hand-held GPS unit. The horizontal datum for this project is the North American Datum 1983 (NAD 83).

The prefix BH represents Borehole, while 16, 17 and 18 refers to 2016, 2017, and 2018, the year of the investigation. The first letter following the dash symbol (-) categorizes the borehole location as Rail in Fill Sections (R), Rail in Cut sections (C), Bridge Abutment (B) or Quarry (Q).

The borehole locations are provided on the Borehole Location Plan, provided in Appendix A.

Table 2-1: Rail Alignment Borehole Locations

Borehole Number	Easting (m)	Northing (m)	Depth (m)
BH16-R003	504,513	7,975,552	5.5
BH16-R004	507,259	7,970,638	4.5
BH16-R005	509,249	7,968,499	4.5
BH16-R006	508,438	7,969,804	2.9
BH16-R007	510,940	7,967,349	4.5
BH16-R008	512,763	7,966,604	4.5
BH16-R009	514,366	7,965,535	4.5
BH16-R010	515,332	7,963,810	4.5
BH16-R011	516,719	7,962,461	4.0
BH16-R012	516,716	7,962,464	4.0
BH16-R013	518,856	7,959,178	4.0
BH16-R014	519,701	7,957,349	4.5
BH16-R015	520,756	7,955,701	4.5
BH16-R016	521,588	7,953,865	4.5
BH16-R017	521,737	7,952,929	4.5
BH16-R018	521,854	7,951,940	4.5
BH16-R019	521,994	7,950,962	4.5
BH16-R020	521,842	7,949,969	4.5
BH16-R021	521,784	7,948,976	4.5
BH16-R022	522,305	7,948,153	4.5
BH16-R023	522,505	7,947,177	4.0
BH16-R024	522,558	7,946,129	4.5
BH16-R025	522,989	7,945,094	4.5
BH16-R026	523,165	7,944,366	4.5
BH16-R027	523,442	7,942,265	4.5
BH16-R028	524,061	7,940,538	3.6
BH16-R029	525,062	7,938,851	3.0
BH16-R030	525,291	7,937,897	3.6
BH16-R032	525,991	7,936,109	2.7
BH16-R033	526,653	7,935,439	4.2
BH16-R034	527,056	7,933,500	4.5
BH16-R035	527,423	7,932,310	4.5
BH16-R036	527,210	7,931,660	4.5
BH16-R037	527,873	7,929,786	4.5

Borehole Number	Easting (m)	Northing (m)	Depth (m)
BH16-R038	528,501	7,928,421	4.5
BH16-R039	528,666	7,927,955	4.5
BH16-R040	528,686	7,927,755	4.5
BH16-R041	528,605	7,927,754	1.5
BH16-R042	528,517	7,927,713	4.5
BH16-R043	528,428	7,927,675	9.0
BH16-R044	528,736	7,926,992	4.5
BH16-R045	528,961	7,926,756	4.5
BH16-R046	529,065	7,926,599	4.6
BH16-R053	528,238	7,928,027	6.1
BH16-R067	535,406	7,918,572	4.6
BH16-R068	537,046	7,919,096	4.6
BH16-R069	539,489	7,920,583	4.6
BH16-R070	540,273	7,921,201	4.6
BH16-C006	508,897	7,968,767	3
BH16-C007	517,221	7,962,080	7.6
BH16-C008	520,080	7,956,909	13.7
BH16-C009	522,032	7,948,728	9.1
BH16-C010	522,513	7,946,595	5.5
BH16-C011	525,427	7,937,567	10.6
BH16-C012	526,569	7,935,536	4.6
BH16-C015	536,142	7,918,691	7.6
BH16-C016	536,362	7,918,814	7.6
BH16-C017	538,597	7,919,724	6.1
BH16-C018	546,111	7,920,740	6.1
BH16-C019	546,163	7,920,494	4.5
BH16-C019B	546,214	7,920,455	6
BH16-C020	546,402	7,920,072	10
BH16-C021	546,593	7,919,917	9
BH16-C022	547,077	7,919,746	9.1
BH16-C023	547,304	7,919,643	10.7
BH16-C024	547,530	7,919,537	10.7
BH16-C025	548,370	7,919,181	7.6
BH16-C026	550,262	7,918,123	10.7
BH16-C027	550,416	7,917,928	12.2
BH16-C028	551,403	7,916,768	11.6
BH16-C029	552,569	7,915,813	7.6
BH16-C030	555,337	7,915,646	12.2
BH16-C031	556,864	7,915,216	1.5
BH16-C032	557,282	7,915,265	9.1
BH16-C201	553,750	7,915,276	2.4
BH16-C202	554,531	7,915,452	7.6
BH16-C203	555,007	7,915,451	9.1
BH16-C204	555,659	7,915,432	2.7
BH16-C205	555,883	7,915,449	8.5
BH16-C206	556,059	7,915,442	9.1
BH16-C207	556,679	7,915,415	7.3
BH17-C001	509,861	7,967,883	9.1
BH17-C002	519,513	7,957,644	10.7
BH17-C003	520,091	7,957,302	9.1
BH17-C004	520,484	7,956,357	10.7
BH17-C005	525,227	7,938,527	9.1

Borehole Number	Easting (m)	Northing (m)	Depth (m)
BH17-C006	527,370	7,932,609	10.7
BH17-C006B	528,253	7,929,081	6.1
BH17-C007	528,564	7,917,138	4.6
BH17-C010	529,961	7,916,702	5.5
BH17-C011	532,072	7,917,478	10.6
BH17-C012	533,228	7,918,553	4.6
BH17-C013	534,196	7,918,569	7.6

Table 2-2: Bridge Abutment Borehole Locations

Borehole Number	Easting (m)	Northing (m)	Depth (m)
BH16-B001	514,191	7,965,675	11.5
BH16-B002	514,290	7,965,604	13.7
BH16-B003	514,357	7,965,533	16.8
BH16-B004	514,367	7,965,540	16.8
BH16-B009	542,204	7,922,291	27.4
BH16-B010	542,208	7,922,304	14.0
BH16-B011	542,365	7,922,121	10.7
BH16-B012	542,376	7,922,131	9.1
BH16-B013	555,619	7,914,671	10.7
BH16-B014	555,599	7,914,683	9.1
BH16-B015	555,824	7,914,884	13.6
BH16-B016	555,830	7,914,892	7.6
BH17-B001	529,031	7,916,747	16.5
BH17-B002	529,323	7,916,577	25.6
BH17-BR86-1	542,257	7,922,182	39.6
BH17-BR86-2	542,269	7,922,172	39.6
BH17-BR86-3	542,304	7,922,142	39.6
BH18-BR15-1	555,758	7,915,441	17.4
BH18-BR15-2	514,211	7,965,645	16.8
BH18-BR70-1	529,143	7,916,680	32.5
BH18-BR70-2	529,107	7,916,700	28.5
BH18-BR102-1	555,758	7,915,441	11.5
BH18-BR102-2	555,697	7,915,443	16.9

Table 2-3: Quarry Borehole Locations

Borehole Number	Easting (m)	Northing (m)	Depth (m)
BH16-Q001	505,308	7,972,797	4.5
BH16-Q7001	529,144	7,927,494	5.0
BH16-Q7002	530,561	7,928,150	6.9
BH16-Q7003	531,053	7,929,065	9.1
BH16-Q7004	529,264	7,927,466	10.6

2.3 Drilling and Sampling Methodology

The geotechnical boreholes were drilled using a BL100 Mini Sonic Drilling rig shown below in Figure 1; manufactured and operated by Boart Longyear. The boreholes were advanced by vibration of the drill string at a high frequency in addition to rotary motion, and pressure by the drilling head. Sonic drilling does not require water at shallow depths in the overburden, and casing was not used for drilling through overburden. Figure 2 shows the equipment used for

off road transport of personnel and survival shack during the 2017 and 2018 investigations. Other major equipment included generator sets, welding unit, frost fighters and pickup trucks.

Figure 1: Drilling Rig Setup on a Borehole

Figure 2: Survival Shack and Off-Road Transport

When using sonic drilling in overburden, a 3 m drilling rod was advanced 1.5 m into the ground for each run. The bottom 1.5 m was collected into a 4 inch split PVC pipe as shown in Figure 2. Soil collected above the bottom 1.5 m, if encountered, was disposed to ensure the collected sample was not contaminated by surface soil “fall in” accumulated at the bottom of the drilled hole. Soil sample were photographed in the PVC split. Once the material in the split was photographed and sampled, the splits were secured using caps and aluminum tape, and stored in a shipping container at the Milne Port site.

Bedrock was cored using a HQ-3 triple tube wireline core barrel, which required the use of water and casing. In addition, rock coring required the installation of a high-speed rotary head on the drilling rig every time there was a switch from sonic drilling in soil to rock coring.

The Hatch field supervisor documented the materials encountered, and determined in situ testing and sampling requirements. When ice was encountered in the borehole, it was documented and classified according to ASTM D4083. The description of soils as detailed in the geotechnical borehole reports are based on field visual classification and confirmatory laboratory testing in accordance with the explanatory notes included with these reports.

The detailed geotechnical borehole drilling reports are contained in the attached Appendix B and should be referenced for a complete description of soil materials and the in situ testing and sampling performed. Appendix B also contains a set of explanatory notes detailing terminology used in the borehole reports. Additional observations such as testing and sampling procedures, percent recovery, water loss/gain, and mechanical heating of samples were recorded, along with time of observation. Photographs of samples collected during the drilling investigation are contained in Appendix C. An example of a retrieved sample is shown in Figure 3.

Figure 3: Sample Collected in a PVC Split Using a Mini Sonic Drilling Rig

2.4 Safety Management Plan

Safety management was a key consideration during the planning process for the geotechnical investigations. A safety management plan was prepared by Hatch and reviewed by BIM and Boart Longyear. A copy of this Plan is provided in Appendix I. A Job Hazard Analysis (JHA) was developed by Hatch and BIM and reviewed by Boart Longyear. This JHA was reviewed periodically and updated according to the work activities. A notification procedure was prepared by BIM specifically for the drilling activities in remote areas. A copy of both the final JHA and the notification procedure is presented in Appendix I.

2.5 Laboratory Testing

2.5.1 Soil Testing

All samples were shipped to the Hatch geotechnical laboratory in Niagara Falls, a Canadian Council of Independent Laboratories (CCIL) certified laboratory (see Appendix G for the certification document). Representative samples were selected for testing including moisture content, particle size distribution, and pore water salinity in accordance with the standard listed in Table 2-4. Full laboratory test results are presented in Appendix D and laboratory results are summarized in Appendix F. Select laboratory results are also shown on the boreholes in Appendix B.

Table 2-4: Standards Used for the 2016, 2017, and 2018 Geotechnical Investigation

Name	Standard
Standard Test methods for Laboratory Determination of Water Content of Soil and Rock by Mass	ASTM D2216
Standard Test Methods for Particle-Size Distribution of Soils using Sieve Analysis	ASTM D6913
Standard Test method for Particle Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis	ASTM D7928
Standard Test Methods for Pore Water Extraction and Determination of the Soluble Salt Content of Soils by Refractometer	ASTM D4542

2.5.2 Rock Testing

The physical testing of bedrock core and rock samples was completed by Amec Foster Wheeler PLC laboratory in Hamilton, Ontario (CCIL certification is shown in Appendix G). Rock testing was completed following the procedures in the Standards listed in Table 2-5.

Table 2-5: Standards for Testing of Coarse Aggregate

Name	Standard
Standard Test Method for Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus	ASTM D6928
Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates	ASTM C136/C136M
Standard Test Method for Relative Density (Specific Gravity) and Absorption of Coarse Aggregate	ASTM D7172
Resistance of Unconfined Coarse Aggregate to Freezing and Thawing	ASTM D4992

Samples were collected on site for the granitic gneiss, dolomitic limestone and diabase rock types. Four of the samples were collected for physical testing at the laboratory. The rock type, sample collection method and location of the four tested samples are presented in Table 2-6.

Table 2-6: Rock Type and Location of The Tested Samples

Borehole No.	Laboratory Sample No.	Depth Range (m)	UTM Coordinates		Rock Type	Sample Type
			Easting	Northing		
BH16-Q7004	*NF17-01*	4.6-7.6	529,264	7,927,466	Upper Limestone	Core
BH16-Q7004	*NF17-02*	7.6-10.6	529,264	7,927,466	Lower Limestone	Core
BH16-M007(1)	*NF17-03*	6.1-9.1	503,822	7,974,945	Granitic Gneiss	Core
Lump Sample	*NF17-04*	From Surface	547,599	7,921,210	Diabase	Grabbed Sample

(1) The report for this borehole is presented in Appendix B.

2.6 Geophysics

GPR Inc. was contracted to undertake a Ground Penetrating Radar (GPR) survey to assess the extent of ground ice in areas that were identified (i) as ice rich or (ii) to have large ice bodies in the 2016, 2017, and 2018 drilling investigation. The survey required towing of a GPR unit (Figure 4) in a line over the area to be surveyed. Readings were recorded using a handheld output device, which can be seen in Figure 5. A detailed description of the GPR survey technique can be found in Appendix J.

Figure 4: Ground Penetrating Radar Survey Unit

Figure 5: GPR Survey in Progress

Seismic refraction testing was carried out to estimate bedrock depth in areas not accessible by a track mounted drilling rig. A wave was generated by vertically striking a striker plate with a sledgehammer. A line of geophones connected to a data acquisition system was used to record seismic data, shown in Figure 6. A detailed description of the seismic refraction testing can be found in Appendix J.

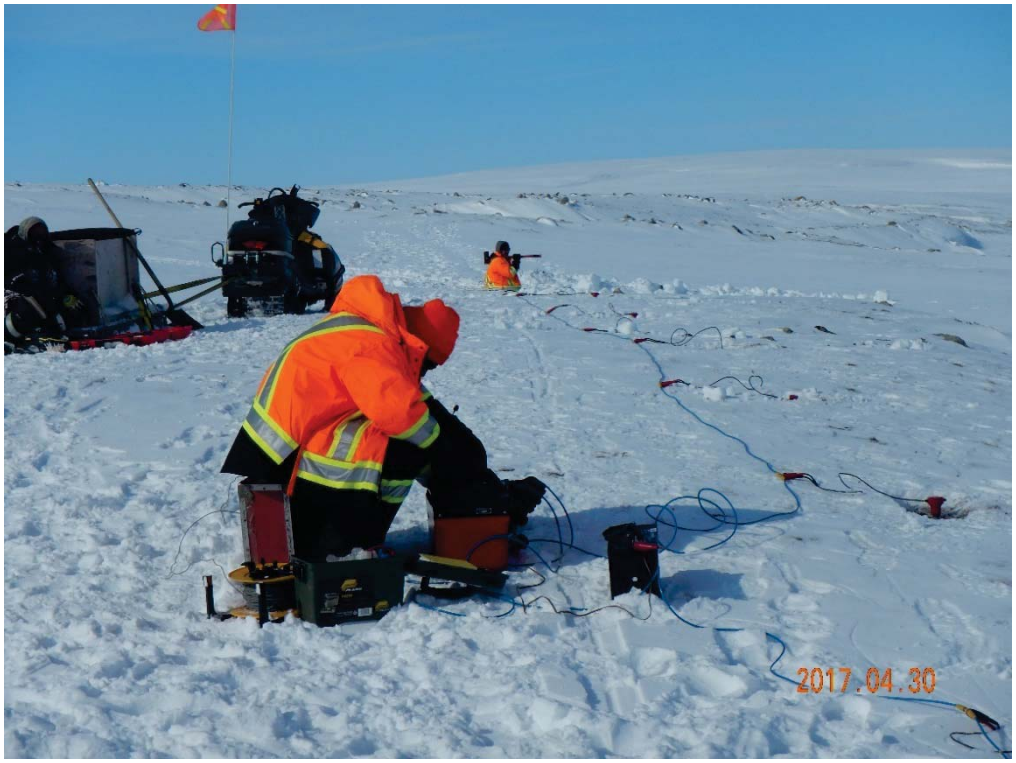

Figure 6: Setup for Seismic Refraction

3. Investigation Results

The sections below include a brief summary of the investigation results. The results of the borehole investigations are presented along the alignment from the Milne Port to the mine site. The boreholes at the bridges and quarry sites are discussed separately.

3.1 Rail Alignment

The following sections contain a summary of the investigation results along the rail alignment grouped by chainage. These observations are a generalization of the borehole findings and the full borehole logs should be consulted to appreciate the full variability of the overburden and bedrock conditions along the alignment. Due to the length of the alignment the investigations are only representative of the conditions in their location and variability may occur between the investigations which have not been considered.

3.1.1 Chainage 0+000 m to 54+000 m

Overburden in this sections of the rail alignment typically consists of sand with silt and/or gravel as secondary components. Layers of gravel or cobbles were encountered in several boreholes in this section. Coarse grain material was often subrounded to rounded, indicating a possible glaciofluvial origin. Layers of coarse grained subangular to angular soil was also encountered and were the most common soil encountered where the rail alignment deviated

from the Phillips Creek. Large ice lenses were encountered in BH16-C008, BH16-C011 and BH17-C002. These are discussed in more detail in Section 3.6.

Granitic gneiss bedrock outcrops were noted in the investigation area along the first 24 km of the alignment. A typical example of a granitic gneiss outcropping is presented in Figure 7.

Figure 7: Typical Granitic Gneiss Bedrock Outcrop

3.1.2 Chainage 54+000 m to 58+000 m

Boreholes between approximately Chainage 54+000 m and 58+000 m intersected sand or sand with silt from the surface to termination depths, and bedrock was not reached in any of these investigations. An example of the material encountered in this section of the alignment is presented in Figure 8.

Figure 8: Typical Sand Encountered in Boreholes Located between Chainage km 54 and km 58 (BH16-R037)

Dolomitic limestone bedrock outcrops were also noted until km 58. A typical dolomitic limestone outcrop is shown in Figure 9.

Figure 9: Typical Dolomitic Limestone Outcrop

3.1.3 Chainage 58+000 m to 70+000 m

No boreholes were drilled in this section of the alignment as part of the 2016-17 investigations due to a lack of access to the borehole locations and weather related constraints. Please see Geophysics surveys SL17-D1 through SL17-D7, in Appendix J, for seismic refraction results from this section of the proposed rail alignment.

3.1.4 Chainage 70+000 m to 100+000 m

Typical overburden along this section of the alignment was found to vary from sand to silt and sand, an example is shown in Figure 10. Much of this section of the alignment is mapped as glaciolacustrine or glaciofluvial in origin, which matches the observed materials. Ice lenses were encountered in several boreholes including a 4.6 m thick ice body encountered in BH16-C023 near km 93 of the rail alignment.

Figure 10: Typical Soil Encountered between Chainage 78+000 m and 90+000 m (BH16-C016)

3.1.5 *Chainage 100+000 m to Terminus*

Boreholes in the remaining section of the alignment, intersected materials ranging from silty sand to sand and gravel. These materials often were intersected within the same borehole. This section generally consists of either a thin veneer of sand and gravel (glacial fluvial) overlying granitic bedrock or exposed granitic rock. Inferred bedrock was encountered in all of the investigations in this section. The bedrock in this area is mapped as sedimentary rocks including dolomitic sandstone and undifferentiated gneiss.

3.2 Proposed Bridge Locations

Drilling was completed at four bridge locations along the rail alignment. The bridge abutment boreholes for bridges 1, 3 and 4 were completed during the 2016, and 2018 investigation; and the bridge 2 boreholes were completed as part of the early 2017 investigation. Three additional holes were drilled for Bridge 3 (KM 86) as part of the geotechnical program completed in late 2017. The approximate chainage for the bridges are as follows: 2

- Bridge 1: 16+000 m
- Bridge 2: 71+000 m
- Bridge 3: 86+000 m
- Bridge 4: 103+000 m.

3.2.1 *Bridge 1*

Investigations for the Bridge 1 abutments (BH16-B001 to B004, and BH18-BR15-1 and BH18-BR-15-2) encountered primarily sand and silt. Boulders or cobbles were intersected in all investigations, up to 1.5 m thick in BH16-B001. Bedrock, consisting of granitic gneiss, was reached at depths of 10.7 m and 10.2 m for boreholes BH18-BR15-1 and BH18-BR15-2 respectively. Ice lenses were intersected in three of the four boreholes completed in 2016, up to 3 m thick in BH16-B001.

3.2.2 *Bridge 2*

The investigations at both abutments of Bridge 2 generally encountered silty, silty sand or sand. A layer of silt with high organic content was encountered between 3.0 and 6.1 m depth in BH17-B002 at the proposed east abutment. An ice layer was encountered from 9.1 m to 10.6 m in BH18-BR70-1. Drilling refusal occurred at a depth of 16.5 m at BH17-B001 and at 25.6 m in BH17-B002. Siltstone to dolomitic limestone bedrock was encountered at depths of 22.9 m and 17.1 m for boreholes BH18-BR70-1 and BH18-BR70-2 respectively.

3.2.3 *Bridge 3*

Overburden materials encountered at the Bridge 3 abutments generally consisted of well bonded frozen sand. Sand and gravel and silty sand layers were observed in some of the boreholes. BH17-BR86-1, BH17-BR86-2 and BH17-BR86-3 were advanced to a target depth of 39.6 m. A 1m thick layer of ice was encountered from 5 m to 6 m deep at BH17-BR86-1. None of the boreholes drilled at the Bridge at km 86 abutments reach bedrock.

3.2.4 Bridge 4

The investigations at both abutments of Bridge 4 generally encountered gravel or sand and gravel. The bedrock was outcropped at the surface at the both edges of the river and dips below the surface moving away from the bridge abutments. Granitic gneiss bedrock was encountered at depths of 1.3 m and 9.7 m for boreholes BH18-102-1 and BH18-BR102-2 respectively.

3.3 Proposed Quarry Boreholes

Most quarry location boreholes were not drilled in the 2016 investigation due to weather constraints and challenges associated with access to their locations; however, following several attempts representative samples of the limestone were recovered approximately 3 km east of the rail alignment at Chainage 58+000 m. A sample of the granitic gneiss was collected from the rail unloading area boreholes at Milne Port. Diabase samples were collected from the surface near Chainage 103+000 m during a site visit in September 2016 and tested during this program.

3.3.1 Overburden

Overburden material of thickness ranging from no cover to approximately 5 m was encountered at the quarry locations.

3.3.2 Bedrock

- Extensive granitic gneiss ridge extends from Chainage 0+000 m to 11+000 m, likely continues to approximately Chainage 24+000 m. Possible quarry locations are available along this ridge.
- Extensive dolomitic limestone ridge extends from Chainage 46+000 m to 58+000 m just east of the rail alignment. Possible quarry locations are available along this ridge.
- Other possible quarry locations were observed east of the rail alignment at approximately Chainage 100+000 m (diabase).

3.4 Laboratory Test Results

The results of the classification and moisture content testing have been presented on the borehole logs in Appendix B, at the corresponding sample depths. The full laboratory reports are included in Appendix D with a summary of the classification test results included as Appendix F. During the investigation, samples of typical rock types were collected, at or near potential quarry locations when possible. Laboratory testing was undertaken to determine the suitability of the rock for use as aggregate, including relative density, absorption, abrasion resistance and unconfined freeze thaw loss. A summary of the laboratory test results for the crushed aggregate samples are presented in Table 3-1. Full laboratory test results are presented in Appendix H.

Table 3-1: Physical Test Results of The Crushed Aggregate Samples

Test Type	Borehole ID: Depth (Lab ID)			
	BH16 – Q7004: 4.6 – 10.6 m	BH16 – Q7004: 4.6 – 10.6 m	BH16 – M007: 6.1 – 9.1 m	Surface Outcrop Sample
	(NF17-01)	(NF17-02)	(NF17-03)	(NF17-04)
Specific Gravity	2.662	2.655	2.618	2.995
Absorption (%)	0.82	0.9	0.37	0.45
Micro-Deval Abrasion (% loss)	10.5	11	4.5	7.9
Unconfined Freeze-Thaw (% loss)	6.7	11.1	1.6	0.8

3.5 Geophysics Results

The GPR investigations were undertaken at fourteen sites along the rail alignment, with seven sites in the deviation area, in order to define ice rich zones. A seismic and georadar survey was undertaken near Chainage 4+500 m of the alignment to determine the depth to bedrock. Seismic surveys were also undertaken at the railway unloading area. The results of the geophysical investigation, including bedrock profiles and ice layer mapping, are presented in Appendix J. Results of the GPR surveys in the ice rich areas are discussed further in Section 3.6.

3.6 Ice Rich Areas

It was found that some of the boreholes drilled during the 2016/2017 rail investigations contained large amounts of ice, and could therefore potentially indicate the presence of large ice bodies. In the area where high ice content were discovered during the borehole investigations, a GPR survey was subsequently used to delineate the subsurface conditions, as presented in Appendix J. Figure 11 is an example of a section of ice core recovered during the borehole investigations.

Figure 11: Ground Ice at Km 47, 1.5 m to 3 m Deep (BH16-C011)

The location of potential ice bodies along the rail alignment may be important for design considerations. Boreholes that contained a significant amount of ice, defined as ice lenses greater than 3 m thick, are shown in Table 3-2.

Table 3-2: Boreholes With Significant Ice Content

Borehole	Ice Depth from Ground Surface (m)	Investigation Depth (m)	Inferred GPR Ice Thickness* (m)
BH16-C008	3	13.7	>10.7
BH16-C011	1.5	10.7	>9.2
BH16-C023	6.1	10.7	>4.6
BH17-C002	2.7	10.7	>8

* Note: the base of the ice lense/body was not reached in any of these investigations.

The inferred ice thicknesses from the GPR surveys are presented in Appendix J. The GPR surveys of the ice rich areas confirmed the results of the borehole investigation and provide inferred thicknesses and extent of these ice rich areas.

3.7 Georadar Surveys Along the Rail Deviation Area

GPR surveys were conducted at seven sites along the rail deviation area subsequent, and as a separate component, to the 2018 Geotechnical Investigation to determine ice depth, thickness, and extent. The chainage of the survey areas spanned from approximately 59 KM to 69 KM, and 77 KM to 78 KM. Ice chunks and Ice lenses were delineated at depths 4 m to 9 m from the surface. Detailed results and ice thickness maps can be found in Appendix J. It should be noted that no boreholes were drilled in the Georadar survey areas along the rail deviation to verify subsurface ice conditions.

4. Summary of Findings

A variety of soil materials were found along the rail alignment including sand, gravel and lesser amounts of silt during the sonic drilling program. The soils along the alignment were primarily alluvium of glaciofluvial or glaciolacustrine origin, or glacial till or moraine deposits. The boreholes along the alignment have been separated based on the primary soil type encountered as summarized in Table 4-1.

Table 4-1: Primary Materials along Rail Alignment

Approximate Alignment Chainage	Borehole/Geophysics ID	Likely Origin of Primary Soils in Borehole
0+000 m to 17+000 m	BH16-R003	Glaciofluvial Origin
	BH16-R004	
	BH16-R006	
	BH16-C006	
	BH16-R005	
	BH17-C001	
	BH16-R007	
	BH16-R008	
	BH16-B001	
	BH16-B002	
	BH16-B004	
	BH16-R009	
	BH16-B003	

Approximate Alignment Chainage	Borehole/Geophysics ID	Likely Origin of Primary Soils in Borehole
	BH18-BR15-1	
	BH18-BR15-2	
17+000 m to 25+000 m	BH16-R010	Mix of glaciofluvial and till/moraine
	BH16-R012	
	BH16-R011	
	BH16-C007	
	BH16-R013	
25+000 m to 37+500 m	BH17-C002	Glaciofluvial
	BH17-C003	
	BH16-R014	
	BH16-C008	
	BH17-C004	
	BH16-R015	
	BH16-R016	
	BH16-R017	
	BH16-R018	
	BH16-R019	
	BH16-R020	
	BH16-R021	
	BH16-C009	
	BH16-R022	
	BH16-R023	
37+500 m to 40+000 m	BH16-C010	Mix of glaciofluvial and till/moraine
	BH16-R024	
	BH16-R025	
40+000 m to 54+000 m	BH16-R026	Glaciofluvial
	BH16-R027	
	BH16-R028	
	BH16-R029	
	BH17-C005	
	BH16-R030	
	BH16-C011	
	BH16-R032	
	BH16-C012	
	BH16-R033	
	BH16-R034	
	BH17-C006	
	BH16-R035	
	BH16-R036	
54+000 m to 58+000	BH16-R037	Glaciolacustrine
	BH17-C006B	
	BH16-R038	
	BH16-R053	
	BH16-R039	
	BH16-R040	
	BH16-R041	
	BH16-R042	
	BH16-R043	
	BH16-R044	
	BH16-R045	
	BH16-R046	
58+000 m to 70+000 m	SL17-D6	Till/moraine

Approximate Alignment Chainage	Borehole/Geophysics ID	Likely Origin of Primary Soils in Borehole
	SL17-D7	
	SL17-D5	
	SL17-D4	
	SL17-D3	
	SL17-D2	
	SL17-D1	
	BH18-BR70-1	
	BH18-BR70-2	
70+000 m to 75+000 m	BH17-C007	Glaciolacustrine
	BH17-B001	
	BH17-B002	
	BH17-C010	
	BH17-C011	
75+000 m to 77+000 m	BH17-C012	Mix of glaciolacustrine and till/moraine deposits
	BH17-C013	
77+000 to 100+000 m	BH16-R067	Glaciolacustrine
	BH16-C015	
	BH16-C016	
	BH16-R068	
	BH16-C017	
	BH16-R069	
	BH16-R070	
	BH16-B009	
	BH16-B010	
	BH16-B011	
	BH16-B012	
	BH16-C018	
	BH16-C019	
	BH16-C019B	
	BH16-C020	
	BH16-C021	
	BH16-C022	
	BH16-C023	
	BH16-C024	
	BH16-C025	
	BH16-C026	
	BH16-C027	
	BH16-C028	
	BH16-C029	
	BH17-BR86-1	
	BH17-BR86-2	
	BH17-BR86-3	
100+000 m to Terminus	BH16-C201	Mix of glaciofluvial and till/moraine deposits
	BH16-C202	
	BH16-C203	
	BH16-C030	
	BH16-B014	
	BH16-B013	
	BH16-C204	
	BH16-B015	
	BH16-B016	
	BH16-C205	

Approximate Alignment Chainage	Borehole/Geophysics ID	Likely Origin of Primary Soils in Borehole
	BH16-C206	
	BH16-C207	
	BH16-C031	
	BH16-C032	
	BH18-BR102-1	
	BH18-BR102-2	

Bedrock was identified in some boreholes and by refractive seismic methods along the rail alignment. Outcroppings of granitic gneiss, dolomitic limestone and diabase were found along the alignment and may provide borrow materials for the rail construction. Ground ice was noted in a number of the boreholes along the alignment. The following locations were identified as having ground ice significant enough to warrant design consideration and alignment modification, other incidents of ground ice were noted in the borehole reports and may also be encountered between the following investigation locations:

- Some ground ice and individual ice inclusions at the proposed Bridge 1 location at an approximate Chainage at 16+000 m along the proposed rail alignment;
- A large ice body was encountered at the cut location at Chainage 26+700 m on the proposed rail alignment 3 m below the existing ground surface elevation;
- A large ice body was encountered at the cut location at Chainage 47+300 m on the proposed rail alignment at 3 m below the existing ground surface elevation; and
- A large ice body or lenses were encountered at the cut location at Chainage 77+000 m on the proposed rail alignment at approximately 1.5 m to 2.5 m below the existing ground surface elevation;
- Frequent ice inclusions and irregularly oriented excess ice were found at the boreholes drilled between Chainage 92+000 m and 96+000 m of the proposed rail alignment.

A ground-penetrating radar unit was used to confirm and delineate the ice rich areas identified above, with the exception of the previous proposed bridge location at approximately Chainage 92+000 m to 96+000 m.

5. References

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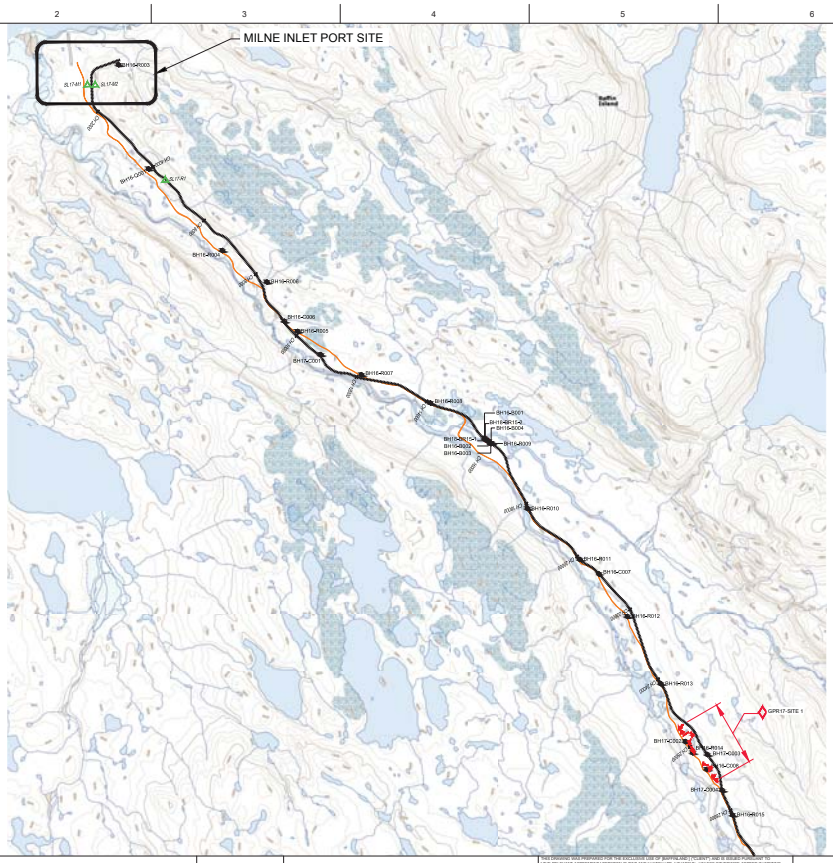
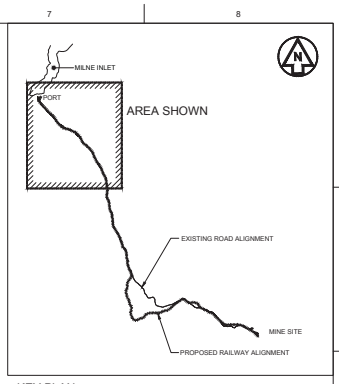
Appendix A
Borehole Location Plan

DWG. No. H353004-10000-229-230-0005





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LEGEND

- AS-BUILT BOREHOLE LOCATION
- CHAINAGE POINT ALONG RAIL ALIGNMENT
- SEISMIC LINE LOCATION
- GROUND PENETRATING RADAR SURVEY (GPR) AREA
- PROPOSED RAILWAY
- EXISTING TOTE ROAD

REFERENCES:

FOR SEISMIC AND GROUND PENETRATING RADAR DETAILS SEE GEOPHYSICS GPR INTERNATIONAL INC REPORT

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SCALE 1:50 000 (B1 SHEET)

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Baffinland

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DESIGNER	M YANG	NR	20/08/2018
CHECKER	W HOYLE		20/08/2018
DESIGN COORD.	M YANG		20/08/2018
RESP. ENG.	H GHIABI		20/08/2018
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MARY RIVER EXPANSION PROJECT

GEOTECHNICAL INVESTIGATIONS
LOCATION PLAN
SHEET 1 OF 4

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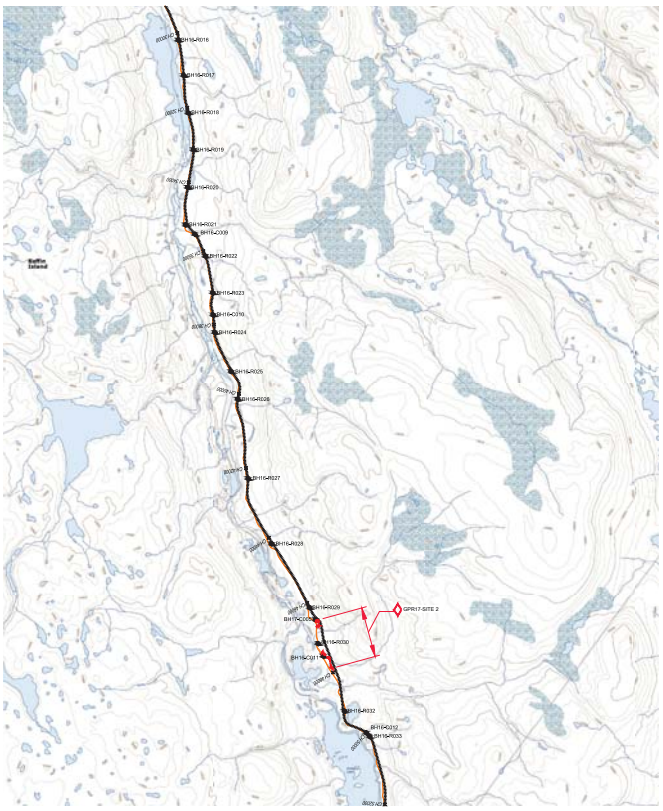

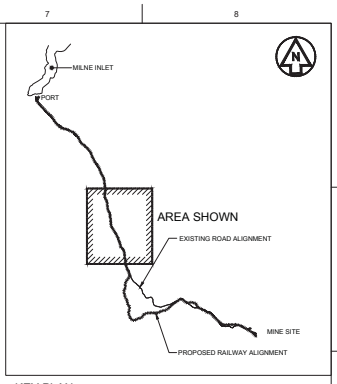

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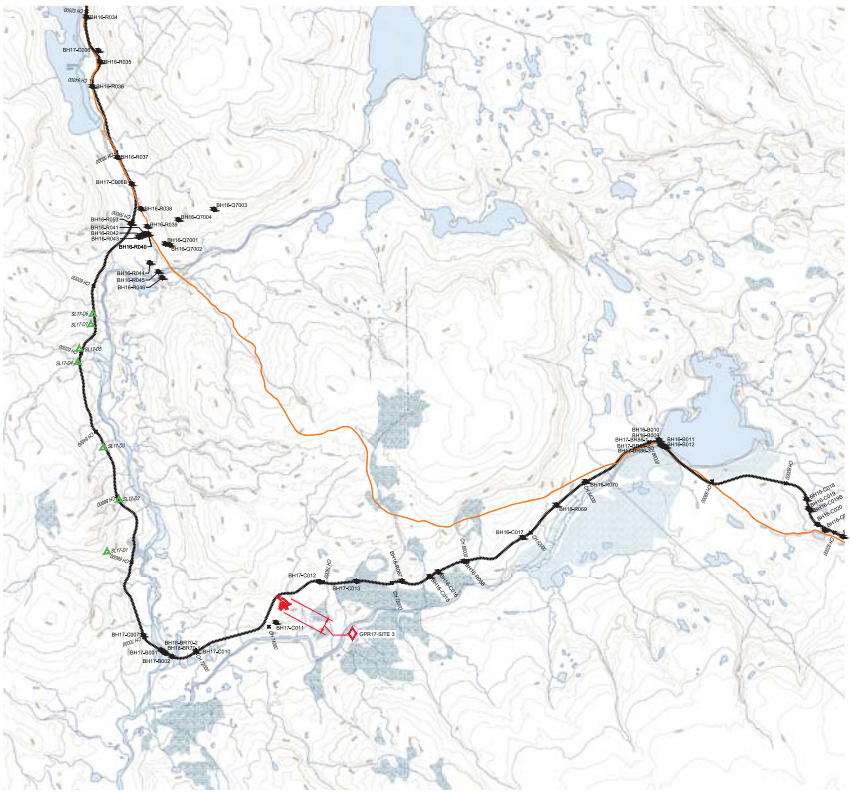

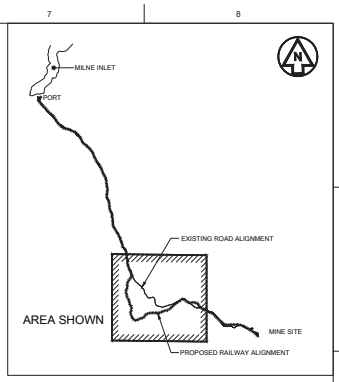

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- SEISMIC LINE LOCATION
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REFERENCES:

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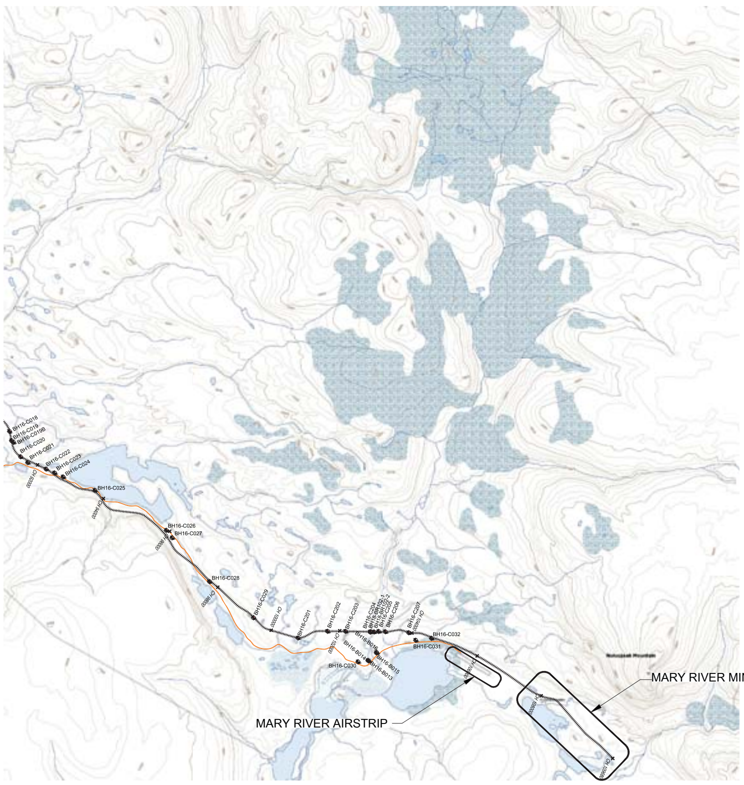

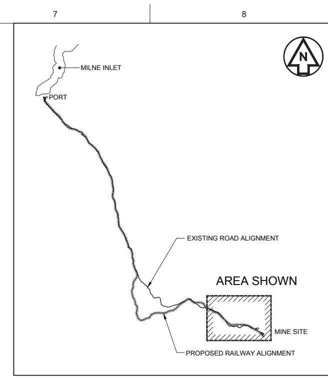

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- CHAINAGE POINT ALONG RAIL ALIGNMENT
- SEISMIC LINE LOCATION
- GROUND PENETRATING RADAR SURVEY (GPR) AREA
- PROPOSED RAILWAY (ALIGNMENT ADDED IN MARCH 2018)
- EXISTING TOTE ROAD

REFERENCES:

FOR SEISMIC AND GROUND PENETRATING RADAR DETAILS SEE GEOPHYSICS GPR INTERNATIONAL INC REPORT

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BAFFINLAND IRON ORE MINES LP
MARY RIVER EXPANSION PROJECT

GEOTECHNICAL INVESTIGATIONS
LOCATION PLAN
SHEET 4 OF 4

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Appendix B
Borehole Reports

List of Abbreviations and Terms Used in the Borehole Reports

(Sheet 1)

General

Elevations
Elevations are referenced to datum indicated.

Depth
All depths are given in meters (feet) measured from the ground surface unless otherwise noted.

Sample Recovery
Indicates the length retained in millimeters (inches) in a split spoon sampler or percentage recovery of sample retained in the core barrel sampler.

Sample Number
Samples are numbered consecutively in the order in which they were obtained or attempted in the borehole.

Sample Type
The first letter describes the sampling method and the second, the shipping container.

Sampling Method

A – Split Tube	E – Auger
B – Thin Wall Tube	F – Wash
C – Piston Sampler	G – Shovel Grab Sample
D – Core Barrel	K – Slotted Sampler

Shipping Container

O – Tube	U – Not Recovered
P – Water Content Tin	X – Plastic & PVC Sleeve (Sonic)
Q – Jar	Y – Core Box
S – Plastic Bag	Z – Discarded

Abbreviations
N/A – Not applicable
N/E – Not encountered
N/O – Not observed

Soil

Soil Description, Label and Symbol
Soil description under the "Description" column conforms generally, but not rigorously, to the Unified Soils Classification System. For a given soil unit, defined by depth boundaries, the descriptive text constitutes the definitive soil unit description and takes precedence over both the brief label and the symbol used to graphically represent the soil unit.

Grain Size

Clay		<0.002 mm
Silt	0.002 –	0.075 mm
Sand	0.075 –	4.75 mm
Fine	0.075 –	0.42 mm
Medium	0.42 –	2.00 mm
Course	2.00 –	4.75 mm
Gravel	4.75 –	75 mm
Fine	4.75 –	19.00 mm
Coarse	19.00 –	75.00mm
Cobbles	75 –	300 mm
Boulder		>300 mm

Relative Quantities

Term	*Example*	*(%)*
Trace	Trace sand	1 – 10
Some	Some sand	10 – 20
With (adjective)	With Sand (Sandy)	20 – 35
And	And sand	>35
Noun	Sand	>50

Standard Penetration Test (SPT)
The test is carried out in accordance with ASTM D-1586 and the 'N' value corresponds to the sum of the number of blows required by a 63.5-kg (140-lb) hammer, dropped 760 mm (30 in.), to drive a 50-mm (2-in.) diameter split tube sampler the second and third 150 mm (6 in.) of penetration.

Density (Granular Soils)

	N(SPT)
Very loose	0 – 4
Loose	4 – 10
Compact	10 – 30
Dense	30 – 50
Very dense	>50

Consistency (Cohesive Soils)

	N(SPT)
Very soft	<2
Soft	2 – 4
Firm	4 – 8
Stiff	8 – 15
Very stiff	15 – 30
Hard	>30

Plasticity/Compressibility

		Liquid Limit (%)
Low plasticity clays	Low compressibility silts	<30
Medium plasticity clays	Medium compressibility silts	30 – 50
High plasticity clays	High compressibility silts	>50

Dilatancy
None - No visible change, during shaking or squeezing
Slow - Water appears slowly on surface of specimen during shaking and does not disappear or disappears slowly upon squeezing.
Rapid - Water appears quickly on the surface of specimen during shaking and disappears quickly upon squeezing.

Sensitivity

Insensitive	<2
Low	2 – 4
Medium	4 – 8
High	8 – 16
Quick	>16

HATCH™ List of Abbreviations and Terms Used in the Borehole Reports

(Sheet 2)

Rock

Core Recovery
Sum of lengths of rock core recovered from a core run, divided by the length of the core run and expressed as a percentage.

RQD (Rock Quality Designation)
Sum of lengths of hard, sound pieces of rock core equal to or greater than 100 mm from a core run, divided by the length of the core run and expressed as a percentage. Measured along centerline of core. Core fractured by drilling is considered intact. RQD normally quoted for N-size core.

RQD (%) Rock Quality

90	-	100	Excellent
75	-	90	Good
50	-	75	Fair
25	-	50	Poor
0	-	25	Very Poor

Grain Size

Term	*Grain Size*
Very coarse-grained	>60 mm
Coarse-grained	2 mm - 60 mm
Medium-grained	60 μm - 2 mm
Fine-grained	2 μm - 60 μm
Very fine-grained	< 2 μm

Bedding

Term	*Bed Thickness*			
Very thickly bedded		>2 m		>6.50 ft
Thickly bedded	600 mm -	2 m	2.00 -	6.50 ft
Medium bedded	200 mm -	600 mm	0.65 -	2.00 ft
Thinly bedded	60 mm -	200 mm	0.20 -	0.65 ft
Very thinly bedded	20 mm -	60 mm	0.06 -	0.20 ft
Laminated	6 mm -	20 mm	0.02 -	0.06 ft
Thinly laminated		<6 mm		<0.02 ft

Discontinuity Frequency
Expressed as the number of discontinuities per meter or discontinuities per foot. Excludes drill-induced fractures and fragmented zones.

Discontinuity Spacing

Term	*Average Spacing*			
Extremely widely spaced		>6 m		>20.00 ft
Very widely spaced	2 m -	6 m	6.50 -	20.00 ft
Widely spaced	600 mm -	2 m	2.00 -	6.50 ft
Moderately spaced	200 mm -	600 mm	0.65 -	2.00 ft
Closely spaced	60 mm -	200 mm	0.20 -	0.65 ft
Very closely spaced	20 mm -	60 mm	0.06 -	0.20 ft
Extremely closely spaced		<20 mm		<0.06 ft

Note: Excludes drill-induced fractures and fragmented rock.

Broken Zone
Zone of full diameter core of very low RQD which may include some drill-induced fractures.

Fragmented Zone
Zone where core is less than full diameter and RQD = 0.

Strength

Term	*Description*	*Unconfined Compressive Strength (MPa)*	*(psi)*
Extremely weak rock	Indented by thumbnail	0.25 – 1.0	36 – 145
Very weak	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife	1.0 – 5.0	145 – 725
Weak rock	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer	5.0 – 25	725 – 3625
Medium strong rock	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with single firm blow of geological hammer to facture it	25 – 50	3625 –7250
Strong rock	Specimen requires more than one blow of geological hammer to fracture it	50 – 100	7250 – 14500
Very strong rock	Specimen requires many blows of geological hammer to fracture it	100 – 250	14500 – 36250
Extremely strong rock	Specimen can only be chipped with geological hammer	>250	>36250

Weathering

Term	*Description*
Fresh	No Visible sign of rock material weathering
Faintly weathered	Discoloration on major discontinuity surfaces.
Slightly weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker than in its fresh condition.
Moderately weathered	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a continuous framework or as corestones.
Highly weathered	More than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones.
Completely weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.
Residual soil	All rock material is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported.

BASIS FOR SOIL DESCRIPTION

(Based on AS1726-1993 - Geotechnical Site Investigations, with modifications)

GRAPHIC SYMBOLS FOR SOILS

GRAVEL – poorly graded - 

well graded - 

SAND – poorly graded - 

well graded - 

SILT – of low plasticity - 

of high plasticity - 

CLAY – of low plasticity - 

of high plasticity - 

ICE - 

COBBLES AND BOULDERS - 

ORGANIC/ PEATY SOIL - 

FILL/ MADE GROUND - 

Composite soil types are presented using combined symbols, eg. **Gravelly Sandy CLAY** 

GROUNDWATER OBSERVATIONS

Permanent Water Level 

Temporary Water Level 

Inflow into Pit or Borehole

Outflow/ Water Loss in Borehole 

Slow Inflow/ Seepage into Pit or Borehole 

SAMPLE TYPES

Disturbed bag sample 

Bulk Disturbed (>20kg) 

Hollow Stem Auger Core 

Auger Flight Cuttings 

Standard Penetration Test (SPT), with Disturbed Split-Spoon Sample 

SPT (no recovery) 

Thin walled "undisturbed" push tube sample eg. U60, U100 etc 

Sample attempted with no recovery 

BASIS FOR ROCK DESCRIPTION

(Based on AS1726-1993 - Geotechnical Site Investigations, with modifications)

GRAPHIC SYMBOLS FOR SOILS

GRAVEL – poorly graded - 

well graded - 

SAND – poorly graded - 

well graded - 

SILT – of low plasticity - 

of high plasticity - 

CLAY – of low plasticity - 

of high plasticity - 

FINE GRAINED TAILINGS - 

COBBLES AND BOULDERS - 

ORGANIC/ PEATY SOIL - 

FILL/ MADE GROUND - 

Composite soil types are presented using combined symbols, eg. **Gravelly Sandy CLAY** 

GRAPHIC SYMBOLS FOR ROCKS

SEDIMENTARY

SHALE 

CLAYSTONE 

SILTSTONE 

SANDSTONE 

CONGLOMERATE 

BRECCIA 

CORE LOSS 

CARBONATE

LIMESTONE 

Calcareous CLAYSTONE 

Calcareous SILTSTONE 

CALCARENITE 

CALCIRUDITE 

CALCRETE 

EVAPORITES

GYPSUM 

IGNEOUS

COARSE GRAINED 

MEDIUM GRAINED 

FINE GRAINED 

DOLERITE 

METAMORPHIC

COARSE GRAINED 

MEDIUM GRAINED 

FINE GRAINED 

Additional rock graphics may be added for specific projects.

GROUNDWATER OBSERVATIONS

Permanent Water Level 

Temporary Water Level 

Inflow into Pit or Borehole 

Outflow/ Water Loss in Borehole 

Slow Inflow/ Seepage into Pit or Borehole 

SAMPLE TYPES

Disturbed bag sample 

Bulk Disturbed (>20kg) 

Hollow Stem Auger Core 

Auger Flight Cuttings 

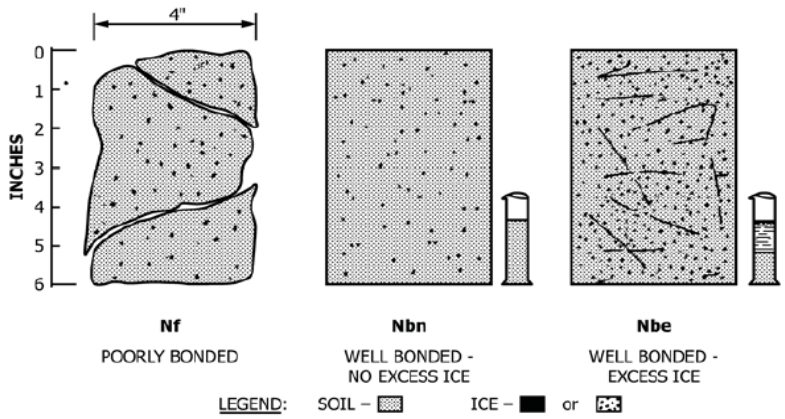
Standard Penetration Test (SPT), with Disturbed Split-Spoon Sample 

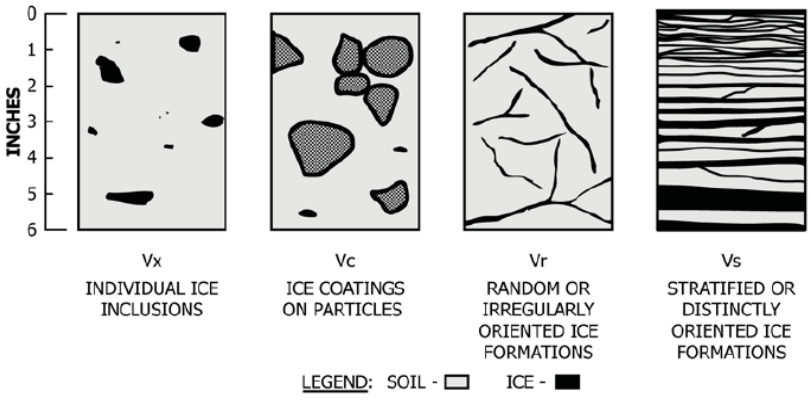
SPT (no recovery) 

Thin walled "undisturbed" push tube sample eg. U60, U100 etc 

Sample attempted with no recovery 

Symbol	Description
Nf	Poorly bonded with no visible excess ice
Nbn	Well bonded with no visible excess ice
Nbe	Well bonded with excess cie
Vx	Individual ice inclusions
Vc	Ice coatings on particles
Vr	Random or Irregularly oriented ice formations
Vs	Stratified or distrinctly oriented ice formations





BOREHOLE REPORT

BH16-B001
Sheet 1 of 2

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 514,191.0 m
Northing: 7,965,675.0 m
Surface Elevation: 78.00 m
Bottom Elevation: 66.50 m
Total Depth: 11.5 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Michael Scott
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 12/3/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	77.0	1.0	Vibracore	H-Casing		SILT: Organic, fine grained	Vx										
						ICE LENSE, silt inclusions: Grey to dark grey, soft, cloudy texture	ICE										
	76.0	2.0				SILTY SAND, trace GRAVEL, trace COBBLES: Grey to light brown, fine to coarse grained sand, subangular to rounded cobbles	Vc										
	75.0	3.0					Nbe				9						
	74.0	4.0									19	6	66	29			
	73.0	5.0					Nbn										
	72.0	6.0				BOULDERS: Grey, granitic gneiss and mafic gneiss with pulvurized powder	Nf										
	71.0	7.0															
	70.0	8.0				Sandy SILT, trace COBBLES, trace BOULDERS: Reddish brown, rounded to subrounded cobbles	Nf										
	69.0	9.0															
	68.0	10.0															

Notes:

BOREHOLE REPORT

BH16-B001

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 514,191.0 m

Northing: 7,965,675.0 m

Surface Elevation: 78.00 m

Bottom Elevation: 66.50 m

Total Depth: 11.5 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 12/3/2016

Driller: Michael Scott

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	67.0	11.0		[11.5]		BOULDERS: Pulverized rock, angular, possible bedrock											
	66.0	12.0				Drilling Refusal. **Drillhole BH16-B001 terminated at 11.5m.**											
	65.0	13.0															
	64.0	14.0															
	63.0	15.0															
	62.0	16.0															
	61.0	17.0															
	60.0	18.0															
	59.0	19.0															
	58.0	20.0															

Notes:

BOREHOLE REPORT

BH16-B002
Sheet 1 of 2

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 514,290.0 m
Northing: 7,965,604.0 m
Surface Elevation: 78.00 m
Bottom Elevation: 64.90 m
Total Depth: 13.1 m
Logged By: UK
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: E.Beachamp
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 12/2/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	77.0	1.0	Vibracore	H-Casing		SAND: Dark brown to grey, some organics	Nf										
	76.0	2.0				SANDY GRAVEL, some COBBLES: Grey to brown, coarse grained sand, angular gravel	Nf				11						
	75.0	3.0				SAND, some COBBLES, some BOULDERS: Grey, fine grained sand, rounded to subrounded cobbles and boulders	Nf										
	74.0	4.0															
	73.0	5.0				SILTY SAND, some COBBLES, trace GRAVEL: Grey, fine grained sand	Nbn										
	72.0	6.0									14	5	77	19			
	71.0	7.0				SAND, some SILT, trace GRAVEL: Grey	Nf										
						BOULDERS: Granitic, fragmented											
	70.0	8.0				SANDY SILT: Grey, fine grained											
						BOULDERS: Granitic gneiss, rock fragments and boulders											
	69.0	9.0				SILTY SAND, some COBBLES, some BOULDERS: Dark grey, fine to coarse grained sand, rounded to subrounded cobbles	Nf										
	68.0	10.0															

Notes:

HATCH BOREHOLE REPORT

BH16-B002

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 514,290.0 m

Northing: 7,965,604.0 m

Surface Elevation: 78.00 m

Bottom Elevation: 64.90 m

Total Depth: 13.1 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 12/2/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	67.0	11.0				SILTY SAND, some COBBLES, some BOULDERS: Dark grey, fine to coarse grained sand, rounded to subrounded cobbles *(Continued)*	Nf *(Continued)*										
	66.0	12.0															
	65.0	13.0		[13.1]		SILT, some SAND, trace GRAVEL: Light brown to grey, granular to cohesive, fine to medium grained sand, subangular to angular gravel	Nf										
	64.0	14.0				Drilling Refusal. **Drillhole BH16-B002 terminated at 13.1m.**											
	63.0	15.0															
	62.0	16.0															
	61.0	17.0															
	60.0	18.0															
	59.0	19.0															
	58.0	20.0															

Notes:

HATCH BOREHOLE REPORT

BH16-B003

Sheet 1 of 2

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 514,357.0 m
Northing: 7,965,533.0 m
Surface Elevation: 79.00 m
Bottom Elevation: 63.80 m
Total Depth: 15.2 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Michael Scott
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 12/2/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	78.0	1.0	Vibracore	H-Casing		SILTY SAND, with GRAVEL, trace COBBLES: Dark brown to dark grey, Organics, fine to coarse grained sand, subangular gravel	Vc										
	77.0	2.0				GRAVEL, with SAND, some COBBLES, trace SILT: Grey to light brown, fine to coarse grained sand, rounded to subrounded cobbles	Vc				9	24	47	28			
	76.0	3.0				SILTY SAND and GRAVEL: Grey, fine to coarse grained	Nbn										
	75.0	4.0				SAND: Grey, fine to coarse grained sand	Vr										
	74.0	5.0				ICE, silt inclusions: Brown to grey, milky texture											
	73.0	6.0					Vr			>>	100	2	72	26			
	72.0	7.0									23						
	71.0	8.0				SAND, some SILT, trace COBBLES: Reddish brown, rounded to subrounded cobbles	Nf										
	70.0	9.0				SILTY SAND: Grey to brown, fine to coarse grained sand, rounded cobbles											
	69.0	10.0															

Notes:

BOREHOLE REPORT

BH16-B003

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 514,357.0 m

Northing: 7,965,533.0 m

Surface Elevation: 79.00 m

Bottom Elevation: 63.80 m

Total Depth: 15.2 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 12/2/2016

Driller: Michael Scott

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
						BOULDERS: Granitic gneiss											
	68.0	11.0				SILTY SAND, some GRAVEL, some COBBLES: Reddish brown, fine grained sand, angular to subangular gravel	Nf										
	67.0	12.0															
	66.0	13.0															
	65.0	14.0															
	64.0	15.0		[15.2]													
	63.0	16.0				Drilling Refusal. **Drillhole BH16-B003 terminated at 15.2m.**											
	62.0	17.0															
	61.0	18.0															
	60.0	19.0															
	59.0	20.0															

Notes:

BOREHOLE REPORT

BH16-B004

Sheet 1 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 514,367.0 m

Northing: 7,965,540.0 m

Surface Elevation: 79.00 m

Bottom Elevation: 62.80 m

Total Depth: 16.2 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 12/1/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	78.0	1.0	Vibracore	H-Casing		SAND: Grey, coarse grained sand	Nf										
						0.60 m to 1.50 m: SILT, dark grey to dark brown	Nbn										
	77.0	2.0				SILTY SAND, some GRAVEL: Grey, angular to subangular gravel,	Nf				9						
	76.0	3.0															
	75.0	4.0															
	74.0	5.0				ICE, SILT inclusions: Moderate hardness, greyish color, cloudy texture	ICE										
	73.0	6.0				Sand and SILT, trace GRAVEL: Grey, fine to coarse grained sand	Vr			>>	100	7	54	39			
						BOULDERS: Granitic gneiss											
	72.0	7.0				SAND: Grey, fine to coarse grained	Nbn				19	35	44	21			
	71.0	8.0				SAND: Grey, fine to coarse grained	Nbn										
							Nf										
	70.0	9.0				SILTY SAND: Grey to brown, fine to coarse grained	Nf										
	69.0	10.0															

Notes:

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:24

BOREHOLE REPORT

BH16-B004

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 514,367.0 m

Northing: 7,965,540.0 m

Surface Elevation: 79.00 m

Bottom Elevation: 62.80 m

Total Depth: 16.2 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 12/1/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
						ROCK: Granitic gneiss, intact, moderate to high strength											
	68.0	11.0				SILTY SAND, some GRAVEL, trace COBBLES: Brown to reddish brown, fine to coarse grained sand, rounded to subrounded cobbles	Nf											
	67.0	12.0					Vx										
	66.0	13.0															
	65.0	14.0				SAND and SILT, trace COBBLES: Grey to dark grey, fine to medium grained sand, rounded to subrounded cobbles	Vc										
	64.0	15.0															
	63.0	16.0		[16.2]		SAND, some GRAVEL, some COBBLES, trace BOULDERS :Dark grey, fine to coarse grained sand, rounded to subrounded cobbles and boulders	Nf										
	62.0	17.0				Drilling Refusal. **Drillhole BH16-B004 terminated at 16.2m.**											
	61.0	18.0															
	60.0	19.0															
	59.0	20.0															

Notes:

BOREHOLE REPORT

BH16-B009

Sheet 1 of 3

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 542,204.0 m

Northing: 7,922,291.0 m

Surface Elevation: 143.00 m

Bottom Elevation: 115.60 m

Total Depth: 27.4 m

Logged By: RS/CS

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/7/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	142.0	1.0	Vibracore	H-Casing		SAND: Poorly graded, brown, fine to medium grained	Nf										
	141.0	2.0				1.50 m to 4.00 m: Trace SILT	Nbn										
	140.0	3.0															
	139.0	4.0															
	138.0	5.0															
	137.0	6.0															
	136.0	7.0															
	135.0	8.0															
	134.0	9.0															
	133.0	10.0									22	0	98	2			

Notes:

BOREHOLE REPORT

BH16-B009
Sheet 2 of 3

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Easting: 542,204.0 m
Northing: 7,922,291.0 m
Surface Elevation: 143.00 m
Bottom Elevation: 115.60 m
Total Depth: 27.4 m
Logged By: RS/CS
Reviewed By: SH/WH

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 11/7/2016
Driller: E.Beachamp
Hole Diameter (mm): 96
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	132.0	11.0				SAND: Poorly graded, brown, fine to medium grained *(Continued)*	Nf *(Continued)*										
	131.0	12.0															
	130.0	13.0															
	129.0	14.0															
	128.0	15.0															
	127.0	16.0															
	126.0	17.0				SAND and GRAVEL: Rounded to subrounded gravel, fine grained sand	Nbn										
	125.0	18.0															
				[18.8]													
	124.0	19.0															
	123.0	20.0															

Notes:

BOREHOLE REPORT

BH16-B009

Sheet 3 of 3

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 542,204.0 m

Northing: 7,922,291.0 m

Surface Elevation: 143.00 m

Bottom Elevation: 115.60 m

Total Depth: 27.4 m

Logged By: RS/CS

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/7/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	122.0	21.0				SAND and GRAVEL: Rounded to subrounded gravel, fine grained sand *(Continued)*	Nbn *(Continued)*										
	121.0	22.0				SAND: Grey with Brown seams, fine to medium grained sand	Nbn										
	120.0	23.0															
	119.0	24.0															
	118.0	25.0															
	117.0	26.0															
	116.0	27.0															
	115.0	28.0				To Target Depth. **Drillhole BH16-B009 terminated at 27.4m.**											
	114.0	29.0															
	113.0	30.0															

Notes:

BOREHOLE REPORT

BH16-B010

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 542,208.0 m

Northing: 7,922,304.0 m

Surface Elevation: 143.00 m

Bottom Elevation: 133.00 m

Total Depth: 10.0 m

Logged By: CS

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/8/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	142.0	1.0	Vibracore	H-Casing		SAND, trace SILT, trace GRAVEL: Reddish brown, medium to fine grained sand	Nf										
	141.0	2.0					Nbn										
	140.0	3.0									11	5	87	8			
	139.0	4.0				4.20 m: Slight increase in silt content	Nbn										
	138.0	5.0									21	0	98	2			
	137.0	6.0					Nf										
	136.0	7.0				SILTY SAND: Reddish brown to grey, fine to course grained sand	Nbn										
	135.0	8.0															
	134.0	9.0					Nbn										
	133.0	10.0		[10.0]							20	0	61	39			
	132.0	11.0				To Target Depth. **Drillhole BH16-B010 terminated at 10.0m.**											

Notes:

BOREHOLE REPORT

BH16-B011

Sheet 1 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 542,365.0 m

Northing: 7,922,121.0 m

Surface Elevation: 144.00 m

Bottom Elevation: 133.30 m

Total Depth: 10.7 m

Logged By: RS

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/8/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	143.0	1.0	Vibracore	H-Casing		SAND, trace SILT, trace GRAVEL: Light brown, fine to coarse grained sand	Nf										
	142.0	2.0					Nbn										
	141.0	3.0															
	140.0	4.0					Nbe					0	98	2			
	139.0	5.0					Nbn										
	138.0	6.0															
	137.0	7.0															
	136.0	8.0															
	135.0	9.0									19						
	134.0	10.0															

Notes:

BOREHOLE REPORT

BH16-B011

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 542,365.0 m

Northing: 7,922,121.0 m

Surface Elevation: 144.00 m

Bottom Elevation: 133.30 m

Total Depth: 10.7 m

Logged By: RS

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/8/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
				[10.7]		SAND, trace SILT, trace GRAVEL: Light brown, fine to coarse grained sand *(Continued)*	Nf *(Continued)*										
	133.0	11.0				To Target Depth. **Drillhole BH16-B011 terminated at 10.7m.**											
	132.0	12.0															
	131.0	13.0															
	130.0	14.0															
	129.0	15.0															
	128.0	16.0															
	127.0	17.0															
	126.0	18.0															
	125.0	19.0															
	124.0	20.0															

Notes:

BOREHOLE REPORT

BH16-B012

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 542,376.0 m

Northing: 7,922,131.0 m

Surface Elevation: 146.00 m

Bottom Elevation: 136.90 m

Total Depth: 9.1 m

Logged By: RS

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/8/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	146.0	0.0	Vibracore	H-Casing		SAND and GRAVEL: Fine to coarse grained sand, angular to subangular gravel	Nf										
	145.0	1.0				SAND, trace SILT: Brown, fine to medium grained sand	Nbn										
	144.0	2.0															
Standing Water																	
	143.0	3.0				SAND and GRAVEL: Brown, rounded to subrounded gravel, up to 30mm	Nf										
						SITLY SAND, trace GRAVEL: Grey and brown layers	Nbn		☒		12	4	87	9			
	142.0	4.0															
	141.0	5.0															
	140.0	6.0															
	139.0	7.0															
	138.0	8.0							☒								
	137.0	9.0		[9.1]		To Target Depth. **Drillhole BH16-B012 terminated at 9.1m.**											
	136.0	10.0															

Notes:

BOREHOLE REPORT

BH16-B013
Sheet 1 of 2

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 555,619.0 m
Northing: 7,914,671.0 m
Surface Elevation: 154.80 m
Bottom Elevation: 144.20 m
Total Depth: 10.6 m
Logged By: RS/CS
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: E.Beachamp
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 11/13/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	153.8	1.0	Vibracore	H-Casing		SAND and GRAVEL, some COBBLES: Brown, fine to coarse grained sand, angular gravel	Nf										
	152.8	2.0				1.20 m to 3.00 m: Trace to some silt and cobbles	Nf										
	151.8	3.0				SILTY SAND, some GRAVEL: Grey, angular gravel	Nf										
	150.8	4.0				SAND and SILT: Inferred COBBLES or BOULDERS: Brown, white powder					12	0	53	47			
	149.8	5.0															
	148.8	6.0				INFERRED SANDSTONE: Angular pieces of rock, low to moderate strength											
	147.8	7.0															
	146.8	8.0															
	145.8	9.0				INFERRED SANDSTONE BEDROCK											
	144.8	10.0															

Notes:

BOREHOLE REPORT

BH16-B013

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 555,619.0 m

Northing: 7,914,671.0 m

Surface Elevation: 154.80 m

Bottom Elevation: 144.20 m

Total Depth: 10.6 m

Logged By: RS/CS

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/13/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
				[10.6]		INFERRED SANDSTONE: Angular pieces of rock, low to moderate strength *(Continued)*											
	143.8	11.0				To Target Depth. **Drillhole BH16-B013 terminated at 10.6m.**											
	142.8	12.0															
	141.8	13.0															
	140.8	14.0															
	139.8	15.0															
	138.8	16.0															
	137.8	17.0															
	136.8	18.0															
	135.8	19.0															
	134.8	20.0															

Notes:

BOREHOLE REPORT

BH16-B014

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 555,599.0 m

Northing: 7,914,683.0 m

Surface Elevation: 156.00 m

Bottom Elevation: 146.90 m

Total Depth: 9.1 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/28/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	155.0	1.0	Vibracore	H-Casing		SAND and GRAVEL, some COBBLES: Dark grey to brown, medium to coarse grained sand, rounded cobbles 1.50 m to 3.00 m: Trace to some silt	Nf										
	154.0	2.0															
	153.0	3.0				SAND, with GRAVEL, trace COBBLES: Grey, fine to coarse grained sand, angular to subrounded gravel	Nf				12	0	65	35			
	152.0	4.0				4.60 m to 7.0 m: Trace to some silt											
	151.0	5.0															
	150.0	6.0															
	149.0	7.0				SAND with GRAVEL, trace COBBLES: Light grey, white powder, trace cobbles, fine to coarse grained sand, angular gravel					1	0	63	37			
	148.0	8.0				7.90 m: Inferred sandstone bedrock, weak to moderate strength											
	147.0	9.0		[9.1]													
	146.0	10.0				To Target Depth. **Drillhole BH16-B014 terminated at 9.1m.**											

Notes:

BOREHOLE REPORT

BH16-B015

Sheet 1 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 555,824.0 m

Northing: 7,914,884.0 m

Surface Elevation: 156.00 m

Bottom Elevation: 142.40 m

Total Depth: 13.6 m

Logged By: US

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/14/2016

Driller: Michael Scott

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	155.0	1.0	Vibracore	H-Casing		SILTY SAND, with GRAVEL, with COBBLES: Brown, fine to coarse grained sand, angular to rounded gravel and cobbles, well graded	Nf										
	154.0	2.0								>>	100	17	41	41			
	153.0	3.0															
	152.0	4.0															
	151.0	5.0									11	0	63	37			
	150.0	6.0				6.10 m to 7.60 m: Ice rich soil	Vx										
	149.0	7.0															
	148.0	8.0															
	147.0	9.0															
	146.0	10.0				9.70 m to 10.6 m: Ice rich soil	Vr			>>							

Notes:

BOREHOLE REPORT

BH16-B015

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 555,824.0 m

Northing: 7,914,884.0 m

Surface Elevation: 156.00 m

Bottom Elevation: 142.40 m

Total Depth: 13.6 m

Logged By: US

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/14/2016

Driller: Michael Scott

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
							Nf *(Continued)*				100	15	66	20			
	145.0	11.0				SANDSTONE: Pulverized sandstone bedrock with some intact sandstone core, grey to white											
	144.0	12.0															
						INFERRED SANDSTONE BEDROCK: bedrock, moderate strength, good quality											
	143.0	13.0		[13.6]													
	142.0	14.0				To Target Depth. **Drillhole BH16-B015 terminated at 13.6m.**											
	141.0	15.0															
	140.0	16.0															
	139.0	17.0															
	138.0	18.0															
	137.0	19.0															
	136.0	20.0															

Notes:

BOREHOLE REPORT

BH16-B016

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 555,830.0 m

Northing: 7,914,892.0 m

Surface Elevation: 153.00 m

Bottom Elevation: 145.40 m

Total Depth: 7.6 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/16/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	152.0	1.0	Vibracore	H-Casing		GRAVEL and SAND, some SILT, trace COBBLES: Light brown to brown, fine to coarse grained sand, rounded to subangular gravel	Nf										
	151.0	2.0															
	150.0	3.0				SAND: Grey to light brown, fine to coarse grained sand 2.80 m to 2.90 m: Ice lense	Nf ICE Vx				15	0	88	12			
	149.0	4.0															
	148.0	5.0					Nf					0	67	33			
	147.0	6.0				5.80 m to 6.10 m: Ice lense	ICE										
						SAND, some GRAVEL, some COBBLES: Light brown to grey	Vx										
	146.0	7.0		[7.6]							7	0	66	34			
	145.0	8.0				To Target Depth. **Drillhole BH16-B016 terminated at 7.6m.**											
	144.0	9.0															
	143.0	10.0															

Notes:

BOREHOLE REPORT

BH16-C006

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 508,897.0 m

Northing: 7,968,767.0 m

Surface Elevation: 71.75 m

Bottom Elevation: 69.65 m

Total Depth: 2.1 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 12/3/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	70.8	1.0	Vibracore	H-Casing		SAND, some SILT: Dark brown, organic, medium to coarse grained sand	Nf										
						SILTY SAND, with COBBLES, : Grey to white, pulverized rock and angular rock pieces	Nf										
	69.8	2.0		[2.1]		INFERRED BEDROCK: Granitic gneiss											
						Drilling Refusal. **Drillhole BH16-C006 terminated at 2.1m.**											
	68.8	3.0															
	67.8	4.0															
	66.8	5.0															
	65.8	6.0															
	64.8	7.0															
	63.8	8.0															
	62.8	9.0															
	61.8	10.0															

Notes:

BOREHOLE REPORT

BH16-C007

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 517,221.0 m

Northing: 7,962,080.0 m

Surface Elevation: 105.00 m

Bottom Elevation: 97.40 m

Total Depth: 7.6 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 12/1/2016

Driller: Michael Scott

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	104.0	1.0	Vibracore	H-Casing		SILTY SAND, trace GRAVEL, trace COBBLES: Light brown, fine to medium grained sand, rounded to subangular gravel	Nf										
	103.0	2.0					Vc				17						
	102.0	3.0					Vx										
	101.0	4.0									12	1	73	26			
	100.0	5.0					Nbn										
						4.60 m to 4.80 m: Ice lense	ICE										
	99.0	6.0															
						6.10 m to 7.60 m: Ice rich silty sand	Vx										
	98.0	7.0									39						
				[7.6]													
	97.0	8.0				To Target Depth. **Drillhole BH16-C007 terminated at 7.6m.**											
	96.0	9.0															
	95.0	10.0															

Notes:

BOREHOLE REPORT

BH16-C008

Sheet 1 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 520,080.0 m

Northing: 7,956,909.0 m

Surface Elevation: 119.30 m

Bottom Elevation: 105.60 m

Total Depth: 13.7 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/30/2016

Driller: Michael Scott

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	118.3	1.0	Vibracore	H-Casing		GRAVELLY SAND, some COBBLES and SILT: Light brown to grey, fine to coarse grained sand, rounded to subangular gravel	Nf				13						
	117.3	2.0					Vx										
	116.3	3.0				ICE: Grey to white color, weak to moderate strength, cloudy texture, minor silt inclusions	ICE				20						
	115.3	4.0															
	114.3	5.0															
	113.3	6.0															
	112.3	7.0															
	111.3	8.0															
	110.3	9.0															
	109.3	10.0															

Notes:

BOREHOLE REPORT

BH16-C008

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 520,080.0 m

Northing: 7,956,909.0 m

Surface Elevation: 119.30 m

Bottom Elevation: 105.60 m

Total Depth: 13.7 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/30/2016

Driller: Michael Scott

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	108.3	11.0				ICE: Grey to white color, weak to moderate strength, cloudy texture, minor silt inclusions *(Continued)*	ICE *(Continued)*										
	107.3	12.0															
	106.3	13.0															
				[13.7]													
	105.3	14.0				To Target Depth. **Drillhole BH16-C008 terminated at 13.7m.**											
	104.3	15.0															
	103.3	16.0															
	102.3	17.0															
	101.3	18.0															
	100.3	19.0															
	99.3	20.0															

Notes:

BOREHOLE REPORT

BH16-C009

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 522,032.0 m

Northing: 7,948,728.0 m

Surface Elevation: 136.50 m

Bottom Elevation: 127.40 m

Total Depth: 9.1 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/28/2016

Driller: Michael Scott

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	135.5	1.0	Vibracore	H-Casing		SILTY SAND, trace GRAVEL: Light brown, fine to medium grained sand, angular to subangular gravel	Nf										
	134.5	2.0									13	9	61	30			
	133.5	3.0															
	132.5	4.0															
	131.5	5.0				SILTY SAND, some GRAVEL: Grey, fine to coarse grained sand, angular to subangular gravel	Nbn										
	130.5	6.0					Nf										
	129.5	7.0				SILTY SAND, with COBBLES, with BOULDERS: Grey, coarse grained sand, angular to subangular gravel	Nf										
	128.5	8.0				SILTY SAND, with COBBLES, with BOULDERS: Grey, coarse grained sand, rounded to subrounded cobblesm possible weathered bedrock												
	127.5	9.0		[9.1]		To Target Depth. **Drillhole BH16-C009 terminated at 9.1m.**											
	126.5	10.0															

Notes:

BOREHOLE REPORT

BH16-C010
Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 522,513.0 m
Northing: 7,946,595.0 m
Surface Elevation: 168.20 m
Bottom Elevation: 162.70 m
Total Depth: 5.5 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Michael Scott
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 11/27/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	167.2	1.0	Vibracore	H-Casing		SANDY SILT, with GRAVEL, some COBBLES, trace BOULDERS: Brown, fine to coarse grained sand, angular to subangular gravel, rounded to subrounded cobbles and boulders					12						
						ICE LENSE: Clear, no texture											
	166.2	2.0				SANDY SILT, some COBBLES, trace GRAVEL: Subangular to subrounded cobbles											
						Pulvirized ROCK: Possible boulders or bedrock						9	33	58			
	165.2	3.0				3.00 m to 4.00 m: Pulverized rock mixed with water											
	164.2	4.0				WEATHERED ROCK: Dolomitic limestone											
	163.2	5.0		[5.5]													
	162.2	6.0				Drilling Refusal. **Drillhole BH16-C010 terminated at 5.5m.**											
	161.2	7.0															
	160.2	8.0															
	159.2	9.0															
	158.2	10.0															

Notes:

BOREHOLE REPORT

BH16-C011
Sheet 1 of 2

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Easting: 525,427.0 m
Northing: 7,937,567.0 m
Surface Elevation: 179.00 m
Bottom Elevation: 168.30 m
Total Depth: 10.7 m
Logged By: UK
Reviewed By: SH/WH

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 11/27/2016
Driller: E.Beachamp
Hole Diameter (mm): 96
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	178.0	1.0	Vibracore	H-Casing		SANDY GRAVEL, with SILT, trace COBBLES: Grey, coarse grained sand, angular to subangular gravel											
						Dolomitic Boulder: White, pulverized											
	177.0	2.0				ICE: No soil inclusions, moderate strength, clear to milky white	ICE			>>	100						
	176.0	3.0				3.00 m to 6.10m: White to milky white, cloudy, weak strength											
	175.0	4.0								>>	100						
	174.0	5.0															
	173.0	6.0				6.10m to 7.60 m: White to clear, candled texture in some parts				>>	100						
	172.0	7.0															
	171.0	8.0				7.60m to 10.60 m: Soft, colourless to milky white, clear to cloudy, sand inclusions				>>	100						
	170.0	9.0								>>	100						
	169.0	10.0								>>							

Notes:

BOREHOLE REPORT

BH16-C011

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 525,427.0 m

Northing: 7,937,567.0 m

Surface Elevation: 179.00 m

Bottom Elevation: 168.30 m

Total Depth: 10.7 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/27/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
				[10.7]		ICE: No soil inclusions, moderate strength, clear to milky white *(Continued)*	ICE *(Continued)*				100						
	168.0	11.0				To Target Depth. **Drillhole BH16-C011 terminated at 10.7m.**											
	167.0	12.0															
	166.0	13.0															
	165.0	14.0															
	164.0	15.0															
	163.0	16.0															
	162.0	17.0															
	161.0	18.0															
	160.0	19.0															
	159.0	20.0															

Notes:

BOREHOLE REPORT

BH16-C012
Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion
Location: Tote Road km 53

Project No.: H352034
Datum: NAD83
Platform:

Easting: 526,569.0 m
Northing: 7,935,536.0 m
Surface Elevation: 163.00 m
Bottom Elevation: 158.40 m
Total Depth: 4.6 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Michael Scott
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 11/26/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	163.0	0.0	Vibracore	H-Casing		SAND and GRAVEL: Brown to light brown, organics, fine to coarse grained sand, subangular gravel	Nf										
	162.0	1.0				SAND: With GRAVEL, light brown, trace silt, granular, fine to medium grained, subangular to rounded, poorly bonded, no excess ice, (Nf)											
	161.0	2.0				SANDY SILT and GRAVEL: Grey to light grey, fine to coarse grained sand, subangular to rounded gravel	Vx										
	160.0	3.0				BOULDERS: Pulverized, grey to white, and cobbles of limestone, no bedding, angular 2.70 m to 3.00 m: Weathered rock pieces, dolomitic limestone											
	159.0	4.0		[4.6]		SANDY SILT, some GRAVEL: Grey to white to dark grey, pulvirized dolomite, boulders or bedrock, fine to medium grained, strong rock, faintly weathered, weakly jointed											
	158.0	5.0				Drilling Refusal. **Drillhole BH16-C012 terminated at 4.6m.**											
	157.0	6.0															
	156.0	7.0															
	155.0	8.0															
	154.0	9.0															
	153.0	10.0															

Notes:

HATCH BOREHOLE REPORT

BH16-C015

Sheet 1 of 1

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Easting: 536,142.0 m
Northing: 7,918,691.0 m
Surface Elevation: 189.75 m
Bottom Elevation: 182.15 m
Total Depth: 7.6 m
Logged By: UK,MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 11/24/2016
Driller: E.Beachamp
Hole Diameter (mm): 96
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	188.8	1.0	Vibracore	H-Casing		SILTY SAND, some GRAVEL, trace COBBLES: Brown to grey, organics, coarse grained sand, angular to sunangular gravel, loose,	Nf				9						
	187.8	2.0				SILTY SAND, with GRAVEL: Grey, fine to coarse grained sand, angular to subangular gravel	Nf										
	186.8	3.0				SILTY SAND, some GRAVEL: Light brown to grey, with gravel and cobbles, medium to coarse grained sand, rounded to subangular gravel	Vx										
	185.8	4.0															
	184.8	5.0															
	183.8	6.0															
	182.8	7.0		[7.6]													
	181.8	8.0				To Target Depth. **Drillhole BH16-C015 terminated at 7.6m.**											
	180.8	9.0															
	179.8	10.0															

Notes:

HATCH BOREHOLE REPORT

BH16-C016

Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 536,362.0 m
Northing: 7,918,814.0 m
Surface Elevation: 190.10 m
Bottom Elevation: 182.50 m
Total Depth: 7.6 m
Logged By: UK
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: E.Beachamp
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 11/24/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	189.1	1.0	Vibracore	H-Casing		SAND, some SILT: Reddish brown, coarse grained sand, angular gravel	Nbn				9						
	188.1	2.0				SANDY SILT, with GRAVEL, trace COBBLES: Light grey, fine grained sand, angular to subangular gravel	Vx				9	25	53	22			
	187.1	3.0				SILTY SAND, some GRAVEL: Light brown to grey, fine to coarse grained sand, angular to subangular gravel	Vc										
	186.1	4.0									8						
	185.1	5.0				SANDY GRAVEL, with SILT: Light brown to grey, coarse grained sand, angular to subangular gravel	Nbn										
	184.1	6.0															
	183.1	7.0		[7.6]													
	182.1	8.0				To Target Depth. **Drillhole BH16-C016 terminated at 7.6m.**											
	181.1	9.0															
	180.1	10.0															

Notes:

BOREHOLE REPORT

BH16-C017

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 538,597.0 m

Northing: 7,919,742.0 m

Surface Elevation: 159.90 m

Bottom Elevation: 153.80 m

Total Depth: 6.1 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/23/2016

Driller: Michael Scott

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	158.9	1.0	Vibracore	H-Casing		SAND, some SILT, trace GRAVEL: Brown to light brown, fine to medium grained sand, rounded to subangular gravel	Vx				24	3	74	22			
	157.9	2.0				1.50 m to 3.00 m: Trace cobbles					11						
	156.9	3.0				SAND and GRAVEL, some SILT: Yellowish brown to reddish brown, fine to coarse grained sand, rounded to subangular gravel	Vx										
	155.9	4.0															
	154.9	5.0															
	153.9	6.0		[6.1]							10						
	152.9	7.0				To Target Depth. **Drillhole BH16-C017 terminated at 6.1m.**											
	151.9	8.0															
	150.9	9.0															
	149.9	10.0															

Notes:

BOREHOLE REPORT

BH16-C018
Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 546,111.0 m
Northing: 7,920,740.0 m
Surface Elevation: 160.40 m
Bottom Elevation: 154.30 m
Total Depth: 6.1 m
Logged By: UK
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: E.Beachamp
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 11/10/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	159.4	1.0	Vibracore	H-Casing		SAND, some GRAVEL: Grey, 0.075 mm to 25 mm, angular gravel											
	158.4	2.0									9	1	82	17			
	157.4	3.0				INFERRED BEDROCK: Possible Sandstone, greyish white, thinly bedded, 0.075mm, pulverized rock and intact rock, very low strength, weakly cemented											
	156.4	4.0															
	155.4	5.0															
	154.4	6.0		[6.1]							3						
	153.4	7.0				Drilling Refusal. **Drillhole BH16-C018 terminated at 6.1m.**											
	152.4	8.0															
	151.4	9.0															
	150.4	10.0															

Notes:

BOREHOLE REPORT

BH16-C019

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 546,163.0 m

Northing: 7,920,494.0 m

Surface Elevation: 169.50 m

Bottom Elevation: 165.00 m

Total Depth: 4.5 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/10/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	168.5	1.0	Vibracore	H-Casing		SAND, trace GRAVEL: Brown to reddish brown, medium to coarse grained sand, medium gravel, angular to subangular	Nf										
	167.5	2.0															
	166.5	3.0															
	165.5	4.0		[4.5]													
	164.5	5.0				Drilling Refusal. **Drillhole BH16-C019 terminated at 4.5m.**					8						
	163.5	6.0															
	162.5	7.0															
	161.5	8.0															
	160.5	9.0															
	159.5	10.0															

Notes:

BOREHOLE REPORT

BH16-C019B

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 546,214.0 m

Northing: 7,920,455.0 m

Surface Elevation: 170.40 m

Bottom Elevation: 164.30 m

Total Depth: 6.1 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/10/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	169.4	1.0	Vibracore	H-Casing		SAND, some GRAVEL: Light brown, medium to coarse grained sand, subangular to rounded gravel	Nf										
	168.4	2.0				SAND: White, fine to medium grained, weakly cemented											
	167.4	3.0															
	166.4	4.0															
	165.4	5.0				4.60 m to 6.10 m: Pulverized with angular pieces of quartz and sandstone observed at 4.6m											
	164.4	6.0		[6.0]							0	0	98	1			
	163.4	7.0				Drilling Refusal. **Drillhole BH16-C019B terminated at 6.1m.**											
	162.4	8.0															
	161.4	9.0															
	160.4	10.0															

Notes:

BOREHOLE REPORT

BH16-C020

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 546,402.0 m

Northing: 7,920,072.0 m

Surface Elevation: 166.00 m

Bottom Elevation: 157.00 m

Total Depth: 9.0 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/10/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	165.0	1.0	Vibracore	H-Casing		SAND: Light brown to grey, medium to coarse grained sand, weakly cemented	Nf										
	164.0	2.0									8						
	163.0	3.0					Vr										
	162.0	4.0															
	161.0	5.0					Nf										
	160.0	6.0									8						
	159.0	7.0															
	158.0	8.0															
	157.0	9.0		[9.0]		8.50 m: Weakly cemented sandstone					11						
	156.0	10.0				To Target Depth. **Drillhole BH16-C020 terminated at 9.0m.**											

Notes:

BOREHOLE REPORT

BH16-C021
Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 546,593.0 m
Northing: 7,919,917.0 m
Surface Elevation: 167.10 m
Bottom Elevation: 158.10 m
Total Depth: 9.0 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Samuel Flynn
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 11/9/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 / 50 / 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	166.1	1.0	Vibracore	H-Casing		SAND: Light brown, medium to coarse grained sand	Nf										
	165.1	2.0				ICE LENSE: Colorless to grey, medium strength, clear to cloudy texture, sand inclusions	Nbe				14						
	164.1	3.0				SAND, some GRAVEL, trace SILT: Grey to light brown, fine to coarse grained sand, subangular to rounded gravel	Nf				12						
	163.1	4.0															
	162.1	5.0				SAND WITH SOME GRAVEL: grey to light brown, trace silt, subangular, fine to coarse grained, subangular to rounded, poorly bonded, no excess ice, (Nf)	Nbn										
	161.1	6.0															
	160.1	7.0				7.00 m: Broken pieces of weak sandstone 7.50 m to 8.70 m: Trace Silt											
	159.1	8.0															
	158.1	9.0		[9.0]		8.70 m: Light grey powder at 8.7m with angular pieces of quartz sandstone, possible bedrock					5	0	67	33			
	157.1	10.0				Drilling Refusal. **Drillhole BH16-C021 terminated at 9.0m.**											

Notes:

BOREHOLE REPORT

BH16-C022

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 547,077.0 m

Northing: 7,919,746.0 m

Surface Elevation: 163.20 m

Bottom Elevation: 154.10 m

Total Depth: 9.1 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/11/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	163.2	0.0	Vibracore	H-Casing		PEAT, with SAND: Grey, black, fragmented	Nf										
	162.2	1.0				SAND, trace SILT: Grey, medium to coarse grained	Nbn										
	161.2	2.0				1.50 m: Loose, fine to coarse grained, poorly bonded,											
	160.2	3.0				2.60 m: Moderately banded	Nf										
	159.2	4.0					Vx										
	158.2	5.0									19	0	98	2			
	157.2	6.0				6.40 m: Grey to Brown											
	156.2	7.0				7.00 m: Trace cobbles											
	155.2	8.0				ICE LENSE: Grey to blue, Cloudy texture, minor sand and silt inclusions					24						
	154.2	9.0		[9.1]		To Target Depth. **Drillhole BH16-C022 terminated at 9.1m.**											
	153.2	10.0															

Notes:

BOREHOLE REPORT

BH16-C023
Sheet 1 of 2

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 547,304.0 m
Northing: 7,919,643.0 m
Surface Elevation: 165.90 m
Bottom Elevation: 155.20 m
Total Depth: 10.7 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Samuel Flynn
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 11/11/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 / 50 / 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	164.9	1.0	Vibracore	H-Casing		PEAT, with SAND: Brown to dark grey, medium to coarse grained sand	Nf										
						SAND, trace SILT: Dark grey to brown, medium to coarse grained sand	Nbn										
	163.9	2.0															
	162.9	3.0				SAND, trace GRAVEL: Grey to light brown, fine to coarse grained sand, subangular to rounded gravel	Nf										
	161.9	4.0									16	0	93	7			
	160.9	5.0				4.60 m to 6.20 m: Light brown, sand and silt, some gravel					17	12	44	45			
	159.9	6.0				ICE: Colorless to white, soft to moderate strength, clear to cloudy texture, minor silt and sand inclusions					15	12	44	45			
	158.9	7.0															
	157.9	8.0															
	156.9	9.0															
	155.9	10.0															

Notes:

BOREHOLE REPORT

BH16-C023

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 547,304.0 m

Northing: 7,919,643.0 m

Surface Elevation: 165.90 m

Bottom Elevation: 155.20 m

Total Depth: 10.7 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/11/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
				[10.7]		ICE: Colorless to white, soft to moderate strength, clear to cloudy texture, minor silt and sand inclusions *(Continued)*											
	154.9	11.0				To Target Depth. **Drillhole BH16-C023 terminated at 10.7m.**											
	153.9	12.0															
	152.9	13.0															
	151.9	14.0															
	150.9	15.0															
	149.9	16.0															
	148.9	17.0															
	147.9	18.0															
	146.9	19.0															
	145.9	20.0															

Notes:

HATCH BOREHOLE REPORT

BH16-C024

Sheet 1 of 2

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Easting: 547,530.0 m
Northing: 7,919,537.0 m
Surface Elevation: 165.00 m
Bottom Elevation: 154.30 m
Total Depth: 10.7 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 11/12/2016
Driller: Samuel Flynn
Hole Diameter (mm): 96
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	164.0	1.0	Vibracore	H-Casing		SAND, trace SILT, trace GRAVEL: Light brown, medium to coarse grained sand, rounded to subangular gravel	Nf										
	163.0	2.0															
	162.0	3.0				3.00 m to 6.00 m: No gravel observed											
	161.0	4.0															
	160.0	5.0									18	0	90	10			
	159.0	6.0				6.10 m to 10.70 m: Light reddish brown sand	Vx										
	158.0	7.0									18						
	157.0	8.0															
	156.0	9.0					Vr										
	155.0	10.0															

Notes:

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BOREHOLE REPORT

BH16-C024

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 547,530.0 m

Northing: 7,919,537.0 m

Surface Elevation: 165.00 m

Bottom Elevation: 154.30 m

Total Depth: 10.7 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/12/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
				[10.7]		SAND, trace SILT, trace GRAVEL: Light brown, medium to coarse grained sand, rounded to subangular gravel *(Continued)*	Nf *(Continued)*				14						
	154.0	11.0				To Target Depth. **Drillhole BH16-C024 terminated at 10.7m.**											
	153.0	12.0															
	152.0	13.0															
	151.0	14.0															
	150.0	15.0															
	149.0	16.0															
	148.0	17.0															
	147.0	18.0															
	146.0	19.0															
	145.0	20.0															

Notes:

BOREHOLE REPORT

BH16-C025

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 548,370.0 m

Northing: 7,919,181.0 m

Surface Elevation: 163.00 m

Bottom Elevation: 155.40 m

Total Depth: 7.6 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/12/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	162.0	1.0	Vibracore	H-Casing		GRAVELLY SILTY SAND: Brown, fine to coarse grained											
	161.0	2.0															
	160.0	3.0															
	159.0	4.0					Nbn				15	1	89	10			
	158.0	5.0					Nf										
	157.0	6.0				ICE: Grey to blue, moderate hardness milky to cloudy texture, sand inclusions 6.10 m to 7.00 m: White to pink, cloudy texture, sand and silt inclusions											
	156.0	7.0		[7.6]		SAND and SILT: LIght brown, fine grained sand	Vx										
	155.0	8.0				To Target Depth. **Drillhole BH16-C025 terminated at 7.6m.**											
	154.0	9.0															
	153.0	10.0															

Notes:

BOREHOLE REPORT

BH16-C026
Sheet 1 of 2

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 550,262.0 m
Northing: 7,918,123.0 m
Surface Elevation: 170.20 m
Bottom Elevation: 159.50 m
Total Depth: 10.7 m
Logged By: UK
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: E.Beachamp
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 11/12/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	169.2	1.0	Vibracore	H-Casing		SNOW and ROOTLETS											
						SILTY SAND, trace GRAVEL: Dark brown, coarse grained sand	Nf										
	168.2	2.0					Nbn										
	167.2	3.0				SILTY SAND, trace GRAVEL: Brown, fine to medium grained	Nbn										
	166.2	4.0				3.90 m to 4.30 m: Some cobbles and gravel	Nbn				14	6	69	24			
						ICE: Minor silt inclusions	ICE										
	165.2	5.0				SAND and SILT, trace GRAVEL: Brown, fine grained to medium grained sand						2	77	21			
	164.2	6.0				INFERRED BOULDERS											
						SILTY SAND, trace GRAVEL: Grey, fine to coarse grained sand	Nf				19						
	163.2	7.0															
	162.2	8.0									13						
	161.2	9.0															
	160.2	10.0															

Notes:

BOREHOLE REPORT

BH16-C026

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 550,262.0 m

Northing: 7,918,123.0 m

Surface Elevation: 170.20 m

Bottom Elevation: 159.50 m

Total Depth: 10.7 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/12/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
				[10.7]		SILTY SAND, trace GRAVEL: Grey, fine to coarse grained sand *(Continued)*	Nf *(Continued)*										
	159.2	11.0				To Target Depth. **Drillhole BH16-C026 terminated at 10.7m.**											
	158.2	12.0															
	157.2	13.0															
	156.2	14.0															
	155.2	15.0															
	154.2	16.0															
	153.2	17.0															
	152.2	18.0															
	151.2	19.0															
	150.2	20.0															

Notes:

BOREHOLE REPORT

BH16-C027
Sheet 1 of 2

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 550,416.0 m
Northing: 7,917,928.0 m
Surface Elevation: 171.00 m
Bottom Elevation: 158.80 m
Total Depth: 12.2 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Samuel Flynn
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 11/12/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unoserved due to permafrost	170.0	1.0	Vibracore	H-Casing		SAND and GRAVEL: Peat, dark grey	Nf										
						SAND and GRAVEL: Dark grey, medium to coarse grained sand, rounded to subrounded gravel	Nf										
	169.0	2.0				SILTY SAND, trace GRAVEL: Light brown, medium to coarse grained sand, rounded to subangular gravel	Nf										
	168.0	3.0					Nbn										
	167.0	4.0									10	9	72	20			
	166.0	5.0															
	165.0	6.0				ICE: Grey, low to medium strength, cloudy texture	ICE										
						SILTY SAND, trace GRAVEL: Light brown to grey, fine to coarse grained sand, rounded to subangular gravel	Nf										
	164.0	7.0									16						
						ICE: Grey, low strength, cloudy texture, soil inclusions	ICE										
	163.0	8.0				7.90 to 12.20 m: Colourless to white, moderate strength, clear to cloudy texture											
	162.0	9.0															
	161.0	10.0															

Notes:

BOREHOLE REPORT

BH16-C027

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 550,416.0 m

Northing: 7,917,928.0 m

Surface Elevation: 171.00 m

Bottom Elevation: 158.80 m

Total Depth: 12.2 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/12/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	160.0	11.0				ICE: Grey, low strength, cloudy texture, soil inclusions *(Continued)*	ICE *(Continued)*										
	159.0	12.0		[12.2]													
						To Target Depth. **Drillhole BH16-C027 terminated at 12.2m.**											
	158.0	13.0															
	157.0	14.0															
	156.0	15.0															
	155.0	16.0															
	154.0	17.0															
	153.0	18.0															
	152.0	19.0															
	151.0	20.0															

Notes:

BOREHOLE REPORT

BH16-C028
Sheet 1 of 2

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Easting: 551,403.0 m
Northing: 7,916,768.0 m
Surface Elevation: 189.00 m
Bottom Elevation: 177.40 m
Total Depth: 11.6 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 11/12/2016
Driller: Samuel Flynn
Hole Diameter (mm): 96
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 / 50 / 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	188.0	1.0	Vibracore	H-Casing		SAND and GRAVEL, trace COBBLES: Light brown, medium to coarse grained sand, rounded to subangular gravel	Nf										
	187.0	2.0				SAND, with GRAVEL: Grey, fine to coarse grained sand, rounded to subangular gravel	Nf										
	186.0	3.0															
	185.0	4.0															
	184.0	5.0															
	183.0	6.0				SAND, trace SILT: Light grey, fine to course grained sand	Nf										
	182.0	7.0															
	181.0	8.0															
	180.0	9.0									7	0	6	94			
	179.0	10.0				9.40 m to 10.70 m: Some gravel and cobbles					18						

Notes:

BOREHOLE REPORT

BH16-C028

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 551,403.0 m

Northing: 7,916,768.0 m

Surface Elevation: 189.00 m

Bottom Elevation: 177.40 m

Total Depth: 11.6 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/12/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
						SAND, trace SILT: Light grey, fine to course grained sand *(Continued)*	Nf *(Continued)*										
	178.0	11.0				SAND, some GRAVEL, trace COBBLES: Reddish brown, fine to coarse grained sand, angular to subrounded gravel	Nf										
						10.80 m: Possible weathered bedrock, pulverized quartz sandstone											
	177.0	12.0		[12.2]		Drilling Refusal.											
						Drillhole BH16-C028 terminated at 11.6m.											
	176.0	13.0															
	175.0	14.0															
	174.0	15.0															
	173.0	16.0															
	172.0	17.0															
	171.0	18.0															
	170.0	19.0															
	169.0	20.0															

Notes:

HATCH BOREHOLE REPORT

BH16-C029

Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 552,569.0 m
Northing: 7,915,813.0 m
Surface Elevation: 185.25 m
Bottom Elevation: 177.65 m
Total Depth: 7.6 m
Logged By: UK
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: E.Beachamp
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 11/13/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	184.3	1.0	Vibracore	H-Casing		SILTY SAND: Brown to reddish brown, fine grained sand	Nbn										
	183.3	2.0									21	1	75	25			
	182.3	3.0					Nf										
	181.3	4.0				3.70 m to 6.10 m: Low-strength pieces of rock											
	180.3	5.0															
	179.3	6.0															
	178.3	7.0		[7.6]		Reddish brown rocks, narrow bedding, very weak											
	177.3	8.0				To Target Depth. **Drillhole BH16-C029 terminated at 7.6m.**											
	176.3	9.0															
	175.3	10.0															

Notes:

BOREHOLE REPORT

BH16-C030
Sheet 1 of 2

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 555,337.0 m
Northing: 7,914,646.0 m
Surface Elevation: 160.75 m
Bottom Elevation: 148.55 m
Total Depth: 12.2 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Michael Scott
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 11/15/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	159.8	1.0	Vibracore	H-Casing		SAND, trace GRAVEL: Light brown, medium to coarse grained sand, rounded to subrounded gravel	Nf										
	158.8	2.0				SAND, trace SILT, trace GRAVEL: Light brown, fine to coarse grained sand	Vc				14						
	157.8	3.0															
	156.8	4.0															
	155.8	5.0									19	3	94	3			
	154.8	6.0				ICE and SOIL: White, low strength, cloudy texture, mixed with SILTY SAND											
	153.8	7.0															
	152.8	8.0															
	151.8	9.0															
	150.8	10.0															

Notes:

BOREHOLE REPORT

BH16-C030

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 555,337.0 m

Northing: 7,914,646.0 m

Surface Elevation: 160.75 m

Bottom Elevation: 148.55 m

Total Depth: 12.2 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/15/2016

Driller: Michael Scott

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	149.8	11.0				ICE and SOIL: White, low strength, cloudy texture, mixed with SILTY SAND *(Continued)*											
	148.8	12.0		[12.2]		To Target Depth. **Drillhole BH16-C030 terminated at 12.2m.**											
	147.8	13.0															
	146.8	14.0															
	145.8	15.0															
	144.8	16.0															
	143.8	17.0															
	142.8	18.0															
	141.8	19.0															
	140.8	20.0															

Notes:

BOREHOLE REPORT

BH16-C031

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 556,864.0 m

Northing: 7,915,216.0 m

Surface Elevation: 170.00 m

Bottom Elevation: 168.50 m

Total Depth: 1.5 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/15/2016

Driller: Michael Scott

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	169.0	1.0	Vibracore	H-Casing		SAND, trace GRAVEL: Brown, fine to coarse grained sand, angular to subangular gravel	Nf										
		[1.5]				To Target Depth. **Drillhole BH16-C031 terminated at 1.5m.**											
	168.0	2.0															
	167.0	3.0															
	166.0	4.0															
	165.0	5.0															
	164.0	6.0															
	163.0	7.0															
	162.0	8.0															
	161.0	9.0															
	160.0	10.0															

Notes:

BOREHOLE REPORT

BH16-C032

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 557,282.0 m

Northing: 7,915,265.0 m

Surface Elevation: 171.00 m

Bottom Elevation: 161.90 m

Total Depth: 9.1 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/15/2016

Driller: Michael Scott

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	170.0	1.0	Vibracore	H-Casing		PEAT, with SAND and GRAVEL: Brown, medium to coarse grained sand, rounded to subangular gravel	Nf										
	169.0	2.0				SILTY SAND, some GRAVEL: Light brown, medium to coarse grained sand, rounded to subangular gravel	Nf				11	10	71	19			
	168.0	3.0				SILTY SAND and GRAVEL, trace COBBLES: Light brown, medium to coarse grained sand, rounded to subrounded cobbles	Nf										
	167.0	4.0															
	166.0	5.0					Vc										
	165.0	6.0															
	164.0	7.0				ICE and SOIL: Dark grey to light brown, cloudy texture, ice mixed with silty sand	ICE										
	163.0	8.0															
	162.0	9.0		[9.1]		SILTY SAND and GRAVEL, trace COBBLES: Light brown, medium to coarse grained sand, rounded to subrounded cobbles	Vc										
	161.0	10.0				To Target Depth. **Drillhole BH16-C032 terminated at 9.1m.**											
	160.0	11.0															

Notes:

BOREHOLE REPORT

BH16-C201

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 553,750.0 m

Northing: 7,915,276.0 m

Surface Elevation: 178.00 m

Bottom Elevation: 175.60 m

Total Depth: 2.4 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/18/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	177.0	1.0	Vibracore	H-Casing		SAND, some GRAVEL, trace COBBLES: Reddish brown, fine to coarse grained sand, angular to subangular gravel, some silt											
	176.0	2.0		[2.4]		ROCK: Weak to medium strong, sedimentary, grey and white crystals											
	175.0	3.0				To Target Depth. **Drillhole BH16-C201 terminated at 2.4m.**											
	174.0	4.0															
	173.0	5.0															
	172.0	6.0															
	171.0	7.0															
	170.0	8.0															
	169.0	9.0															
	168.0	10.0															

Notes:

BOREHOLE REPORT

BH16-C202

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 554,531.0 m

Northing: 7,915,452.0 m

Surface Elevation: 174.50 m

Bottom Elevation: 166.90 m

Total Depth: 7.6 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/16/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	174.5	0.0	Vibracore	H-Casing		TOPSOIL, SILTY SAND, with GRAVEL	Nf										
	173.5	1.0				SILTY SAND, with GRAVEL: Light brown, medium to coarse grained sand	Nf										
	172.5	2.0															
	171.5	3.0				Crushed COBBLES and BOULDERS: Grey to pink, fine to coarse grained sand											
	170.5	4.0															
	169.5	5.0				BOULDERS: Grey to light green, granitic gneiss and chloritic schist, medium to coarse grained, very thinly bedded, medium strength, slightly weathered											
	168.5	6.0				INFERRED BEDROCK: Laminated to very thinly bedded, faintly weathered,											
	167.5	7.0		[7.6]													
	166.5	8.0				To Target Depth. **Drillhole BH16-C202 terminated at 7.6m.**											
	165.5	9.0															
	164.5	10.0															

Notes:

BOREHOLE REPORT

BH16-C203

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 555,007.0 m

Northing: 7,915,451.0 m

Surface Elevation: 177.00 m

Bottom Elevation: 167.90 m

Total Depth: 9.1 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/17/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	176.0	1.0	Vibracore	H-Casing		SILTY SAND, some COBBLES, trace BOULDERS: Grey, fine to coarse grained sand, angular to subangular cobbles	Nf										
	175.0	2.0				SILTY SAND, some GRAVEL: Brown, fine to coarse grained sand	Nf										
	174.0	3.0				SILTY SAND: Brown, fine to medium grained	Nbn										
	173.0	4.0															
	172.0	5.0															
	171.0	6.0				BOULDER: Sandstone, medium grained, medium bedded, weak											
	170.0	7.0				WEATHERED ROCK: Mafic gneiss with crystalline fines observed, shiny face when fracutured, grey and white streaks											
	169.0	8.0				BEDROCK: Gneiss, grey and white bedding layers, approximately 40 mm, thinly bedded,weak to medium quality											
	168.0	9.0		[9.1]													
	167.0	10.0				To Target Depth. **Drillhole BH16-C203 terminated at 9.1m.**											

Notes:

BOREHOLE REPORT

BH16-C204

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 555,659.0 m

Northing: 7,915,432.0 m

Surface Elevation: 173.00 m

Bottom Elevation: 170.30 m

Total Depth: 2.7 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/16/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	172.0	1.0	Vibracore	H-Casing		PEAT, with SAND and GRAVEL: Brown, fine to coarse grained sand	Nf										
						SAND and GRAVEL, trace COBBLES, trace BOULDERS: Light brown to grey	Nf										
	171.0	2.0				SILTY SAND, some GRAVEL, trace COBBLES: Grey, fine to coarse grained sand, rounded to subrounded cobbles	Nf										
		[2.7]															
	170.0	3.0															
	169.0	4.0															
	168.0	5.0				INFERRED BEDROCK: Grey, pulveriszed boulders of gneiss or Franklin diabase observed, subcohesive, no bedding											
	167.0	6.0															
	166.0	7.0															
	165.0	8.0															
	164.0	9.0															
	163.0	10.0				Drilling Refusal. **Drillhole BH16-C204 terminated at 2.7m.**											

Notes:

BOREHOLE REPORT

BH16-C205

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 555,883.0 m

Northing: 7,915,449.0 m

Surface Elevation: 173.00 m

Bottom Elevation: 164.50 m

Total Depth: 8.5 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/21/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	172.0	1.0	Vibracore	H-Casing		SAND, with GRAVEL, some COBBLES, trace BOULDERS: Brown, coarse grained sand, rounded to subangular cobbles and gravel											
	171.0	2.0				GRAVELLY SILTY SAND: Brown to grey, coarse grained sand, rounded to subangular gravel											
	170.0	3.0															
	169.0	4.0									6	20	47	33			
	168.0	5.0				INFERRED BEDROCK: Granitic, white, crushed and pulverized rock pieces											
	167.0	6.0															
	166.0	7.0															
	165.0	8.0		[8.5]													
	164.0	9.0				Drilling Refusal. **Drillhole BH16-C205 terminated at 8.5m.**											
	163.0	10.0															

Notes:

BOREHOLE REPORT

BH16-C206

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 556,059.0 m

Northing: 7,915,442.0 m

Surface Elevation: 173.00 m

Bottom Elevation: 163.90 m

Total Depth: 9.1 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/22/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	172.0	1.0	Vibracore	H-Casing		SAND: White to grey, pulverized rock, weak to moderate strength, fine grained	Nf										
	171.0	2.0				SILTY SAND, some GRAVEL: Dark brown, fine to medium grained sand, angular to subangular gravel	Nf										
						ICE, with Sandy SILT inclusions: Grey, cohesive, fine grained, hard, cloudy	ICE			>>	53						
	170.0	3.0				SAND and GRAVEL: Reddish brown	Vc										
	169.0	4.0					Vr				22						
	168.0	5.0				SANDY SILT, trace GRAVEL: Dark grey, find grained sand	Nbn										
						BOULDERS: Grey, white to grey, pulverized rock, medium strong											
	167.0	6.0				SANDY SILT, trace GRAVEL: Dark brown to grey, find grained sand											
	166.0	7.0				INFERRED BEDROCK: Light grey, pulverized rock with intact pieces, medium strong											
	165.0	8.0															
	164.0	9.0		[9.1]													
	163.0	10.0				To Target Depth. **Drillhole BH16-C206 terminated at 9.1m.**											

Notes:

BOREHOLE REPORT

BH16-C207

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 556,679.0 m

Northing: 7,915,415.0 m

Surface Elevation: 175.00 m

Bottom Elevation: 167.70 m

Total Depth: 7.3 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/21/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	174.0	1.0	Vibracore	H-Casing		SAND and GRAVEL, some COBBLES: Brown, medium to coarse grained sand, subangular to rounded gravel and cobbles	Nf										
	173.0	2.0				SAND, some GRAVEL, trace COBBLES: Grey to light yellow, medium to coarse grained sand, rounded to subangular gravel	Vx				12						
	172.0	3.0															
	171.0	4.0															
	170.0	5.0									2						
	169.0	6.0															
	168.0	7.0		[7.3]		INFERRED BEDROCK: Light grey, pulverized rock, with intact pieces of sandstone, medium strong											
	167.0	8.0				Drilling Refusal. **Drillhole BH16-C207 terminated at 7.3m.**											
	166.0	9.0															
	165.0	10.0															

Notes:

BOREHOLE REPORT

BH16-Q001
Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Potential Quarry Location

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 505,308.0 m
Northing: 7,972,797.0 m
Surface Elevation: 68.25 m
Bottom Elevation: 63.65 m
Total Depth: 4.6 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Samuel Flynn
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 10/5/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	67.3	1.0	Vibracore	H-Casing		ORGANICS: Frozen organic soil	Nf										
						SAND, some GRAVEL, trace COBBLES: Medium to coarse grained sand, fine to coarse gravel, light brown, subangular to rounded											
	66.3	2.0				SAND and GRAVEL trace COBBLES: Coarse sand, fine to coarse gravel, light brown to grey, subangular to rounded	Nf										
	65.3	3.0				3.00 m to 4.60 m: Trace COBBLES											
	64.3	4.0		[4.6]													
	63.3	5.0				To Target Depth. **Drillhole BH16-Q001 terminated at 4.6m.**											
	62.3	6.0															
	61.3	7.0															
	60.3	8.0															
	59.3	9.0															
	58.3	10.0															

Notes:

BOREHOLE REPORT

BH16-Q7001
Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Potential Quarry Location

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 529,144.0 m
Northing: 7,927,494.0 m
Surface Elevation: 187.80 m
Bottom Elevation: 184.20 m
Total Depth: 3.6 m
Logged By: CS
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: E.Beachamp
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 10/24/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 / 50 / 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Water	186.8	1.0	Vibracore	H-Casing		Silty GRAVEL: Light brown, pulverized rock flour (limestone), light grey, subangular to angular limestone, up to 80mm											
	185.8	2.0				SILT, some GRAVEL, trace SAND: Light brown, angular, fine to coarse					11						
	184.8	3.0															
		[3.6]				LIMESTONE: Pulverized, subrounded to round, grey											
	183.8	4.0				To Target Depth. **Drillhole BH16-Q7001 terminated at 3.6m.**											
	182.8	5.0															
	181.8	6.0															
	180.8	7.0															
	179.8	8.0															
	178.8	9.0															
	177.8	10.0															

Notes:

BOREHOLE REPORT

BH16-Q7002
Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Potential Quarry Location

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 530,561.0 m
Northing: 7,928,150.0 m
Surface Elevation: 284.00 m
Bottom Elevation: 277.14 m
Total Depth: 6.9 m
Logged By: RS/CS
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: E.Beachamp
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged:
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	283.0	1.0	HQ-3 Coring	Wash Bore C/B & Casing		No recovery											
	282.0	2.0				Silty GRAVEL, some COBBLES: Brown, fine to coarse gravel, subangular to angular											
	281.0	3.0				No recovery											
	280.0	4.0															
	279.0	5.0				LIMESTONE: Grey, fragmented, angular to subangular, limestone bedrock											
	278.0	6.0		[6.9]		Silty GRAVEL, with COBBLES: Light brown, cobbles and gravel are angular to subangular, grey											
	277.0	7.0				To Target Depth. **Drillhole BH16-Q7002 terminated at 6.9m.**											
	276.0	8.0															
	275.0	9.0															
	274.0	10.0															

Notes:

BOREHOLE REPORT

BH16-Q7003
Sheet 1 of 2

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Potential Quarry Location

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 531,053.0 m
Northing: 7,929,065.0 m
Surface Elevation: 201.00 m
Bottom Elevation: 191.90 m
Total Depth: 9.1 m
Logged By: RS
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: E.Beachamp
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 10/24/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Other Tests
Unobserved due to Permafrost	200.0	1.0	Vibracore	H-Casing		SILT and GRAVEL, trace SAND: Fine grained, angular, beige/grey					
	199.0	2.0				1.50 m to 5.00 m: Visible ice layers, up to 5 mm thick	Vs				
	198.0	3.0									
	197.0	4.0									
	196.0	5.0				SAND: Fine to medium, brown	Nbn				
	195.0	6.0				Gravelly SILT: Well graded, grey					
	194.0	7.0				***Start of Coring at 7.3m.*** ***Continued on Rock Core Log sheet.***					
	193.0	8.0									
	192.0	9.0									
	191.0	10.0									
	190.0	11.0									

Notes:

BOREHOLE LOG

ROCK CORE FORMAT

BH16-Q7003

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Potential Quarry Location

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 531,053.0 m

Northing: 7,929,065.0 m

Surface Elevation: 201.00 m

Bottom Elevation: 191.90 m

Total Depth: 9.1 m

Logged By: RS

Reviewed By: SH/WH

Contractor: Boart Longyear **Rig Type/ Mounting:** MiniSonic Rig **Bearing:** N/A **Date Logged:** 10/24/2016

Driller: E.Beachamp **Hole Diameter (mm):** 96 **Plunge:** Vertical **Date Checked:** 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Geological Unit	Rock Description ROCK TYPE; Grain size, texture and fabric, colour, general defect conditions, minor constituents.	Weathering/ Cementation	Estimated Strength (EH VH H M L VL EL)	$Is_{(50)}$ [UCS] MPa	Defect Spacing mm (2000 600 200 [100] 60 20)	RQD %
	200.0	1.0										
	199.0	2.0										
	198.0	3.0										
	197.0	4.0										
	196.0	5.0										
	195.0	6.0										
	194.0	7.0					***Resuming in Rock Core Format 7.3m.***					
	193.0	8.0					LIMESTONE: Bedrock, fragmented / pulverized rock sample					
	192.0	9.0		[9.1]								
	191.0	10.0					To Target Depth. **Drillhole BH16-Q7003 terminated at 9.1m.**					
	190.0	11.0										

Notes:

BOREHOLE REPORT

BH16-Q7004
Sheet 1 of 3

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Potential Quarry Location

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 529,264.0 m
Northing: 7,927,466.0 m
Surface Elevation: 282.80 m
Bottom Elevation: 272.20 m
Total Depth: 10.6 m
Logged By: RS/CS
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: E.Beachamp
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 10/25/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Other Tests
Unobserved due to Permafrost	281.8	1.0	Vibracore	H-Casing		SILT and GRAVEL: Grey, pulverized limestone					
						No recovery					
	280.8	2.0									
	279.8	3.0									
	278.8	4.0									
		[4.6]				***Start of Coring at 4.6m.***					
						Continued on Rock Core Log sheet.					
	277.8	5.0									
	276.8	6.0									
	275.8	7.0									
	274.8	8.0									
	273.8	9.0									
	272.8	10.0									

Notes:

BOREHOLE LOG

ROCK CORE FORMAT

BH16-Q7004

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Potential Quarry Location

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 529,264.0 m

Northing: 7,927,466.0 m

Surface Elevation: 282.80 m

Bottom Elevation: 272.20 m

Total Depth: 10.6 m

Logged By: RS/CS

Reviewed By: SH/WH

Contractor: Boart Longyear **Rig Type/ Mounting:** MiniSonic Rig **Bearing:** N/A **Date Logged:** 10/25/2016

Driller: E.Beachamp **Hole Diameter (mm):** 96 **Plunge:** Vertical **Date Checked:** 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Geological Unit	Rock Description ROCK TYPE; Grain size, texture and fabric, colour, general defect conditions, minor constituents.	Weathering/ Cementation	Estimated Strength (EH VH H M L VL EL)	$Is_{(50)}$ [UCS] MPa	Defect Spacing mm (2000 600 200 60 20) [100]	RQD %
	281.8	1.0										
	280.8	2.0										
	279.8	3.0										
	278.8	4.0					***Resuming in Rock Core Format 4.6m.***					
	277.8	5.0	HQ-3 Coring	HQ			LIMESTONE: Light grey to brown, thickly bedded, weak to medium strong joints, faintly weathered					77
	276.8	6.0					6.00 m to 7.70 m: Medium texture, very thickly bedded, fresh limestone, medium strong					66
	275.8	7.0										
	274.8	8.0					7.70 m to 10.60 m: Weak to medium strong, subhorizontal joints					52
	273.8	9.0										68
	272.8	10.0										

Notes:

BOREHOLE LOG

ROCK CORE FORMAT

BH16-Q7004

Sheet 3 of 3

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Potential Quarry Location

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 529,264.0 m

Northing: 7,927,466.0 m

Surface Elevation: 282.80 m

Bottom Elevation: 272.20 m

Total Depth: 10.6 m

Logged By: RS/CS

Reviewed By: SH/WH

Contractor: Boart Longyear **Rig Type/ Mounting:** MiniSonic Rig **Bearing:** N/A **Date Logged:** 10/25/2016

Driller: E.Beachamp **Hole Diameter (mm):** 96 **Plunge:** Vertical **Date Checked:** 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Geological Unit	Rock Description ROCK TYPE; Grain size, texture and fabric, colour, general defect conditions, minor constituents.	Weathering/ Cementation	Estimated Strength (EH VH H M L VL EL)	$Is_{(50)}$ [UCS] MPa	Defect Spacing mm (2000 600 200 [100] 60 20)	RQD %
				[10.6]								68
	271.8	11.0					To Target Depth. **Drillhole BH16-Q7004 terminated at 10.6m.**					
	270.8	12.0										
	269.8	13.0										
	268.8	14.0										
	267.8	15.0										
	266.8	16.0										
	265.8	17.0										
	264.8	18.0										
	263.8	19.0										
	262.8	20.0										

Notes:

BOREHOLE REPORT

BH16-R003

Sheet 1 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 504,513.0 m

Northing: 7,975,552.0 m

Surface Elevation: 61.00 m

Bottom Elevation: 55.40 m

Total Depth: 5.6 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/5/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	60.5	0.5	Vibracore	H-Casing		SAND: Coarse to fine grained, moist	Nf										
	60.0	1.0															
	59.5	1.5				SAND and GRAVEL: Fine to coarse grained sand	Nf										
	59.0	2.0															
	58.5	2.5															
	58.0	3.0				3.00 m to 4.6 m: Trace Cobbles	Nf										
	57.5	3.5															
	57.0	4.0															
	56.5	4.5															
	56.0	5.0															

Notes:

BOREHOLE REPORT

BH16-R003

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 504,513.0 m

Northing: 7,975,552.0 m

Surface Elevation: 61.00 m

Bottom Elevation: 55.40 m

Total Depth: 5.6 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/5/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	55.5	5.5				SAND and GRAVEL: Fine to coarse grained sand *(Continued)*	Nf *(Continued)*										
		[5.6]				To Target Depth. **Drillhole BH16-R003 terminated at 5.6m.**											
	55.0	6.0															
	54.5	6.5															
	54.0	7.0															
	53.5	7.5															
	53.0	8.0															
	52.5	8.5															
	52.0	9.0															
	51.5	9.5															
	51.0	10.0															

Notes:

BOREHOLE REPORT

BH16-R004
Sheet 1 of 1

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Easting: 507,259.0 m
Northing: 7,970,638.0 m
Surface Elevation: 43.00 m
Bottom Elevation: 38.43 m
Total Depth: 4.6 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 10/6/2016
Driller: Samuel Flynn
Hole Diameter (mm): 96
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	42.5	0.5	Vibracore	H-Casing		SAND: Organic, fine to coarse grained											
	42.0	1.0				SAND with GRAVEL: Dark brown, medium to coarse grained sand, Rounded to sub rounded gravel	Nf				30						
	41.5	1.5				SAND, some SILT, trace GRAVEL: Fine to coarse grained sand, rounded to subrounded gravel	Nf										
	41.0	2.0															
	40.5	2.5									10	8	74	18			
	40.0	3.0				SAND and COBBLES, with GRAVEL, some SILT: Light brown to grey, fine to course grained sand, rounded cobbles	Nf										
	39.5	3.5															
	39.0	4.0															
	38.5	4.5		[4.6]													
	38.0	5.0				To Target Depth. **Drillhole BH16-R004 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R005
Sheet 1 of 1

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Easting: 509,249.0 m
Northing: 7,968,499.0 m
Surface Elevation: 84.00 m
Bottom Elevation: 79.43 m
Total Depth: 4.6 m
Logged By: UK
Reviewed By: SH/WH

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 10/6/2016
Driller: Vance Madden
Hole Diameter (mm): 96
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 / 50 / 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	83.5	0.5	Vibracore	H-Casing		SAND and GRAVEL, some SILT: Fine to coarse grained sand, subangular gravel	Nf										
	83.0	1.0									11						
	82.5	1.5				SAND, some SILT, trace GRAVEL: Fine to coarse grained sand, angular to subangular gravel	Nbn										
	82.0	2.0															
	81.5	2.5										4	78	18			
	81.0	3.0					Nf										
	80.5	3.5									10						
	80.0	4.0															
	79.5	4.5		[4.6]													
	79.0	5.0				To Target Depth. **Drillhole BH16-R005 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R006

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 508,438.0 m

Northing: 7,969,804.0 m

Surface Elevation: 78.75 m

Bottom Elevation: 75.85 m

Total Depth: 2.9 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/6/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	78.3	0.5	Vibracore	H-Casing		SAND: Organic, dark brown	Nf										
	77.8	1.0				SAND and GRAVEL, trace SILT: Coarse grained sand, angular gravel	Nf										
	77.3	1.5					Nbn										
	76.8	2.0					Nf										
	76.3	2.5		[2.9]													
	75.8	3.0				To Target Depth. **Drillhole BH16-R006 terminated at 2.9m.**											
	75.3	3.5															
	74.8	4.0															
	74.3	4.5															
	73.8	5.0															

Notes:

BOREHOLE REPORT

BH16-R007

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 510,940.0 m

Northing: 7,967,349.0 m

Surface Elevation: 83.00 m

Bottom Elevation: 78.43 m

Total Depth: 4.6 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Driller: Vance Madden

Rig Type/ Mounting: MiniSonic Rig

Hole Diameter (mm): 96

Date Logged: 10/6/2016

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	82.5	0.5	Vibracore	H-Casing		SAND, some GRAVEL, some SILT: Reddish brown, fine to coarse grained sand, angular to subangular gravel	Nf										
	82.0	1.0															
	81.5	1.5				SAND, some SILT, trace Gravel: Grey, fine grained to coarse grained sand, angular to subangular gravel	Nbn										
	81.0	2.0															
	80.5	2.5									13	1	87	13			
	80.0	3.0				SAND, with GRAVEL: Grey, fine to coarse grained sand, angular to subanbgular gravel	Nf										
	79.5	3.5															
	79.0	4.0				GRAVEL: Coarse, angular to subangular	Nf				10						
	78.5	4.5		[4.6]													
	78.0	5.0				To Target Depth. **Drillhole BH16-R007 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R008
Sheet 1 of 1

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Easting: 512,763.0 m
Northing: 7,966,604.0 m
Surface Elevation: 83.50 m
Bottom Elevation: 78.93 m
Total Depth: 4.6 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 10/7/2016
Driller: Samuel Flynn
Hole Diameter (mm): 96
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	83.0	0.5				SAND with GRAVEL: Medium to coarse grained sand, fine to coarse gravel, light brown, subangular to angular	Nf										
	82.5	1.0															
	82.0	1.5				SAND with GRAVEL, trace COBBLES: Light brown to grey, coarse grained sand, fine to coarse gravel, rounded to subangular gravel	Nf											
	81.5	2.0															
	81.0	2.5															
	80.5	3.0				SAND and GRAVEL, some COBBLES: Light brown, fine to coarse grained sand, fine to coarse gravel, rounded to subrounded	Nf											
	80.0	3.5															
	79.5	4.0															
	79.0	4.5															
	78.5	5.0				To Target Depth. **Drillhole BH16-R008 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R009

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 514,367.0 m

Northing: 7,965,535.0 m

Surface Elevation: 79.00 m

Bottom Elevation: 74.43 m

Total Depth: 4.6 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/8/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	79.0	0.0				SAND: Organics, dark brown											
	78.5	0.5				SAND, some GRAVEL: Light brown, fine to coarse grained sand, rounded to subrounded gravel	Nf				23						
	78.0	1.0															
	77.5	1.5				SILTY SANDY GRAVEL, with COBBLES: Medium to coarse grained sand, rounded to subrounded cobbles	Nbn										
	77.0	2.0															
	76.5	2.5															
	76.0	3.0				SILTY SANDY GRAVEL, some COBBLES: Light brown, fine to coarse grained sand, fine to coarse gravel, rounded to subrounded cobbles	Nf										
	75.5	3.5															
	75.0	4.0															
	74.5	4.5															
	74.0	5.0				To Target Depth. **Drillhole BH16-R009 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R010

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 515,332.0 m

Northing: 7,963,810.0 m

Surface Elevation: 80.00 m

Bottom Elevation: 75.43 m

Total Depth: 4.6 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Driller: Vance Madden

Rig Type/ Mounting: MiniSonic Rig

Hole Diameter (mm): 96

Date Logged: 10/8/2016

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	80.0	0.0				SAND and GRAVEL: Brown, angular to subangular gravel	Nf										
	79.5	0.5															
	79.0	1.0															
	78.5	1.5				1.50 m to 2.50 m: Some silt											
	78.0	2.0															
	77.5	2.5				2.50 m to 4.00 m: Sand with some gravel											
	77.0	3.0															
	76.5	3.5															
	76.0	4.0															
	75.5	4.5				To Target Depth. **Drillhole BH16-R010 terminated at 4.6m.**											
	75.0	5.0															

Notes:

BOREHOLE REPORT

BH16-R011

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 516,719.0 m

Northing: 7,962,461.0 m

Surface Elevation: 94.70 m

Bottom Elevation: 90.13 m

Total Depth: 4.6 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/8/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 / 50 / 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	94.2	0.5				SAND and PEAT: Dark brown	Nf										
	93.7	1.0				SAND, some SILT: Brown, fine to coarse grained sand	Nf										
	93.2	1.5															
	92.7	2.0															
	92.2	2.5									19	0	86	14			
	91.7	3.0															
	91.2	3.5															
	90.7	4.0				GRANITE: Pinkish brown, 75 mm, pieces of granite in frozen sand					15						
	90.2	4.5															
	89.7	5.0				Drilling Refusal. **Drillhole BH16-R011 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R012

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 516,716.0 m

Northing: 7,962,464.0 m

Surface Elevation: 106.75 m

Bottom Elevation: 102.75 m

Total Depth: 4.0 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/8/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 / 50 / 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	106.3	0.5				SAND, some GRAVEL, some COBBLES: Brown, well graded, subangular to angular gravel											
	105.8	1.0				SAND, some SILT, trace GRAVEL: Brown, loose, angular to subangular gravel	Nf										
	105.3	1.5				1.50 m to 3.00 m: Greyish brown, fragmented rock pieces	Nf										
	104.8	2.0															
	104.3	2.5									10	1	81	18			
	103.8	3.0				SAND and GRAVEL: Brown, angular to subangular gravel	Nbn										
	103.3	3.5															
	102.8	4.0				Drilling Refusal. **Drillhole BH16-R012 terminated at 4.0m.**											
	102.3	4.5															
	101.8	5.0															

Notes:

BOREHOLE REPORT

BH16-R013
Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 518,856.0 m
Northing: 7,959,178.0 m
Surface Elevation: 107.00 m
Bottom Elevation: 102.43 m
Total Depth: 4.6 m
Logged By: UK
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Vance Madden
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 10/8/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 / 50 / 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	106.5	0.5				SAND, trace GRAVEL: Brown, well graded, angular to subangular gravel											
	106.0	1.0															
	105.5	1.5				SAND, with GRAVEL: Brown, rounded to subangular gravel	Nbn										
	105.0	2.0															
	104.5	2.5				SAND, some SILT: Brown to grey, fine grained sand	Nbn				16	0	85	15			
	104.0	3.0															
	103.5	3.5				Possible GRANITE: Dark grey streaks, dense											
	103.0	4.0									16						
	102.5	4.5															
	102.0	5.0				Drilling Refusal. **Drillhole BH16-R013 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R014

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 519,701.0 m

Northing: 7,957,349.0 m

Surface Elevation: 111.00 m

Bottom Elevation: 106.50 m

Total Depth: 4.5 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/8/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	111.0	0.0				SILTY SAND: Fine grained	Nf										
	110.5	0.5				Silty SAND, with GRAVEL, trace COBBLES: Fine gravel, fine to coarse grained sand	Nf										
	110.0	1.0															
	109.5	1.5				Silty SAND, trace GRAVEL: Subangular to angular gravel, medium to coarse grained sand	Nf										
	109.0	2.0									11	11	69	20			
	108.5	2.5															
	108.0	3.0															
	107.5	3.5															
	107.0	4.0				Sandy GRAVEL, trace COBBLES: Pinkish grey to light brown, coarse grained sand, rounded to subrounded gravel	Nf										
	106.5	4.5				To Target Depth. **Drillhole BH16-R014 terminated at 4.5m.**											
	106.0	5.0															

Notes:

BOREHOLE REPORT

BH16-R015
Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 520,756.0 m
Northing: 7,955,701.0 m
Surface Elevation: 115.00 m
Bottom Elevation: 110.50 m
Total Depth: 4.5 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Samuel Flynn
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 10/8/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	114.5	0.5				GRAVEL with SAND, trace SILT, trace COBBLES: Light brown, fine to coarse gravel, rounded, fine to coarse grained sand	Nf										
	114.0	1.0															
	113.5	1.5				GRAVEL and SAND: Fine to coarse gravel, rounded, fine to medium grained sand, poorly bonded	Nf										
	113.0	2.0															
	112.5	2.5										2	73	24			
	112.0	3.0				SAND with SILT, trace GRAVEL: Light brown, fine to medium grained sand, fine gravel	Nbn										
	111.5	3.5															
	111.0	4.0									13						
	110.5	4.5				To Target Depth. **Drillhole BH16-R015 terminated at 4.5m.**											
	110.0	5.0															

Notes:

BOREHOLE REPORT

BH16-R016

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 521,588.0 m

Northing: 7,953,865.0 m

Surface Elevation: 112.00 m

Bottom Elevation: 107.50 m

Total Depth: 4.5 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/8/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost						SAND: Organic, dark grey											
	111.5	0.5				SILTY SAND, trace GRAVEL, trace COBBLES: Light brown, medium to coarse grained sand, fine to coarse gravel, rounded to subrounded	Nf										
	111.0	1.0									32						
	110.5	1.5					Nbe										
	110.0	2.0									15	8	55	28			
	109.5	2.5				SAND, with GRAVEL, trace SILT: Fine to coarse grained sand, fine to coarse gravel, rounded	Nbe										
	109.0	3.0															
	108.5	3.5															
	108.0	4.0															
	107.5	4.5				To Target Depth. **Drillhole BH16-R016 terminated at 4.5m.**											
	107.0	5.0															

Notes:

BOREHOLE REPORT

BH16-R017
Sheet 1 of 1

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Easting: 521,737.0 m
Northing: 7,952,929.0 m
Surface Elevation: 115.00 m
Bottom Elevation: 110.40 m
Total Depth: 4.6 m
Logged By: UK
Reviewed By: SH/WH

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 10/9/2016
Driller: Vance Madden
Hole Diameter (mm): 96
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost.	114.5	0.5	Vibracore	H-Casing		SILTY SAND and GRAVEL: Brown, fine to coarse grained sand	Nf				29						
	114.0	1.0					Nbn										
	113.5	1.5															
	113.0	2.0															
	112.5	2.5															
	112.0	3.0															
	111.5	3.5															
	111.0	4.0															
	110.5	4.5		[4.6]													
	110.0	5.0				To Target Depth. **Drillhole BH16-R017 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R018
Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 521,854.0 m
Northing: 7,951,940.0 m
Surface Elevation: 113.00 m
Bottom Elevation: 108.40 m
Total Depth: 4.6 m
Logged By: UK
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Vance Madden
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 10/9/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost.	112.5	0.5	Vibracore	H-Casing		SILTY SAND, some Gravel: Brown, fine gravel, rounded to subangular gravel											
	112.0	1.0															
	111.5	1.5				SILTY SAND with GRAVEL: Grey, fine sand, fine to coarse gravel, rounded to subrounded	Nf										
	111.0	2.0															
	110.5	2.5				2.40 m to 3.00 m: Gravel is fine to coarse, well bonded (Nbn)	Nbn										
	110.0	3.0				3.00 m to 3.90 m: Brown to grey, Subangular gravel, fine to coarse	Nf										
	109.5	3.5															
	109.0	4.0				SILTY SAND and BOULDERS: Crushed, grey with white stratification											
	108.5	4.5		[4.6]													
	108.0	5.0				To Target Depth. **Drillhole BH16-R018 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R019

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 521,994.0 m

Northing: 7,950,962.0 m

Surface Elevation: 112.30 m

Bottom Elevation: 107.70 m

Total Depth: 4.6 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/9/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost.	111.8	0.5	Vibracore	H-Casing		SILTY SAND, with GRAVEL, trace COBBLES: Brown, rounded to subangular gravel, well graded	Nf										
	111.3	1.0				GRAVEL and SAND: Brown, rounded to subround gravel	Nf										
	110.8	1.5				SAND,with GRAVEL, with COBBLES: Brown, rounded to subangular gravel	Nf										
	110.3	2.0															
	109.8	2.5				SILTY SAND with GRAVEL: Brown, rounded to subangular gravel, fragmented rock	Nf										
	109.3	3.0				3.00 m to 4.00 m: Grey	Nbn										
	108.8	3.5															
	108.3	4.0				4.00 m to 4.60 m: Some cobbles	Nf										
	107.8	4.5		[4.6]													
	107.3	5.0				To Target Depth. **Drillhole BH16-R019 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R020

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 521,842.0 m

Northing: 7,949,969.0 m

Surface Elevation: 117.50 m

Bottom Elevation: 112.90 m

Total Depth: 4.6 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/9/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 / 50 / 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost.	117.0	0.5	Vibracore	H-Casing		SAND and GRAVEL, some SILT, some COBBLES: Brown, angular to subangular gravel	Nf										
	116.5	1.0															
	116.0	1.5				SILTY SAND, with GRAVEL, with COBBLES: White to grey, angular to subangular gravel, crushed rock	Nf										
	115.5	2.0															
	115.0	2.5															
	114.5	3.0				SILT and SAND: Brown to grey, angular to subangular gravel	Nbn										
	114.0	3.5															
	113.5	4.0									20	0	57	43			
	113.0	4.5		[4.6]													
	112.5	5.0				To Target Depth. **Drillhole BH16-R020 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R021
Sheet 1 of 1

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Easting: 521,784.0 m
Northing: 7,948,976.0 m
Surface Elevation: 123.25 m
Bottom Elevation: 118.75 m
Total Depth: 4.5 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 10/9/2016
Driller: Samuel Flynn
Hole Diameter (mm): 96
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost.	122.8	0.5	Vibracore	H-Casing		SILTY SAND, some GRAVEL, trace COBBLES: Light brown to grey, fine to medium grained sand, fine to coarse gravel, rounded to subangular	Nf										
	122.3	1.0															
	121.8	1.5															
	121.3	2.0				SILTY SAND, some SILT, some GRAVEL, trace COBBLES: Grey to dark grey, angular to subangular gravel, rounded to subrounded cobbles, fine to coarse grained sand	Nf										
	120.8	2.5															
	120.3	3.0				SILTY SAND, some GRAVEL: Light brown to reddish brown, fine to medium grained sand, fine gravel, rounded	Nf										
	119.8	3.5															
	119.3	4.0															
	118.8	4.5		[4.5]		To Target Depth. **Drillhole BH16-R021 terminated at 4.5m.**											
	118.3	5.0															

Notes:

BOREHOLE REPORT

BH16-R022
Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 522,305.0 m
Northing: 7,948,153.0 m
Surface Elevation: 141.40 m
Bottom Elevation: 136.90 m
Total Depth: 4.5 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Samuel Flynn
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 10/9/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost.	140.9	0.5	Vibracore	H-Casing		SILTY SAND and GRAVEL, trace COBBLES: Grey to light brown, angular to subangular gravel, fine to coarse,rounded to subrounded, coarse grained sand	Nf										
	140.4	1.0															
	139.9	1.5															
	139.4	2.0															
	138.9	2.5															
	138.4	3.0				SILT and SAND, some GRAVEL: TILL, grey, fine to coarse grained sand, fine to coarse gravel, rounded to subangular	Nbn										
	137.9	3.5															
	137.4	4.0									9	13	44	44			
	136.9	4.5		[4.5]		To Target Depth. **Drillhole BH16-R022 terminated at 4.5m.**											
	136.4	5.0															

Notes:

BOREHOLE REPORT

BH16-R023

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 522,505.0 m

Northing: 7,947,177.0 m

Surface Elevation: 158.00 m

Bottom Elevation: 154.00 m

Total Depth: 4.0 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/10/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 / 50 / 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	157.5	0.5	Vibracore	H-Casing		SILTY SAND, some GRAVEL: Light brown, fine to medium grained sand, coarse gravel, rounded to subrounded	Nf										
	157.0	1.0				SAND and SILT: Grey, fine to medium grained	Nbn										
	156.5	1.5															
	156.0	2.0										0	61	39			
	155.5	2.5															
	155.0	3.0															
	154.5	3.5															
	154.0	4.0		[4.0]		Drilling Refusal. **Drillhole BH16-R023 terminated at 4.0m.**											
	153.5	4.5															
	153.0	5.0															

Notes:

BOREHOLE REPORT

BH16-R024
Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 522,558.0 m
Northing: 7,946,129.0 m
Surface Elevation: 153.00 m
Bottom Elevation: 148.40 m
Total Depth: 4.6 m
Logged By: UK
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Vance Madden
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 10/10/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	152.5	0.5	Vibracore	H-Casing		SILTY SAND and GRAVEL: Brown, angular to subangular gravel	Nf										
	152.0	1.0															
	151.5	1.5									9	30	38	32			
	151.0	2.0															
	150.5	2.5															
	150.0	3.0					Nbn				8						
	149.5	3.5															
	149.0	4.0															
	148.5	4.5		[4.6]													
	148.0	5.0				To Target Depth. **Drillhole BH16-R024 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R025

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 522,989.0 m

Northing: 7,945,894.0 m

Surface Elevation: 153.75 m

Bottom Elevation: 149.15 m

Total Depth: 4.6 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/10/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserveddue to Permafrost	153.3	0.5	Vibracore	H-Casing		SANDY SILT, some GRAVEL, trace COBBLES: Grey, angular to subabgular gravel	Nf										
	152.8	1.0									18	13	33	54			
	152.3	1.5					Nbn										
	151.8	2.0															
	151.3	2.5									15	16	43	41			
	150.8	3.0					Vx										
	150.3	3.5															
	149.8	4.0									16						
	149.3	4.5		[4.6]													
	148.8	5.0				To Target Depth. **Drillhole BH16-R025 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R026

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 523,165.0 m

Northing: 7,944,366.0 m

Surface Elevation: 152.00 m

Bottom Elevation: 147.40 m

Total Depth: 4.6 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/10/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	152.0	0.0	Vibracore	H-Casing		SAND with GRAVEL, trace SILT: Grey, granular, organics	Nf										
	151.5	0.5				SILTY SAND, wtih GRAVEL: Brown, rounded to subangular GRAVEL	Nf										
	151.0	1.0				0.90 m to 3.00 m : Fragmented rock					27						
	150.5	1.5															
	150.0	2.0															
	149.5	2.5															
	149.0	3.0					Nbn										
	148.5	3.5															
	148.0	4.0									8						
	147.5	4.5		[4.6]													
	147.0	5.0				To Target Depth. **Drillhole BH16-R026 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R027

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 523,442.0 m

Northing: 7,942,265.0 m

Surface Elevation: 171.10 m

Bottom Elevation: 166.50 m

Total Depth: 4.6 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/10/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	170.6	0.5	Vibracore	H-Casing		SAND, with SILT, with COBBLES: Brown, rounded to subrounded cobbles 0.45 m to 1.10 m: Crushed limestone cobbles and boulders	Nf										
	170.1	1.0				SAND and SILT, with GRAVEL: Brown 1.50 m to 3.00 m: Inferred rock/cobbles, fragmented, cobbles rounded to angular	Nf				8	22	43	35			
	169.6	1.5															
	169.1	2.0															
	168.6	2.5															
	168.1	3.0				SILTY SAND, with GRAVEL, with COBBLES: Brown, rounded to subangular gravel	Nbn										
	167.6	3.5															
	167.1	4.0									9						
	166.6	4.5		[4.6]													
	166.1	5.0				To Target Depth. **Drillhole BH16-R027 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R028

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 524,061.0 m

Northing: 7,940,538.0 m

Surface Elevation: 172.30 m

Bottom Elevation: 168.70 m

Total Depth: 3.6 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/10/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	171.8	0.5	Vibracore	H-Casing		SAND and SILT, some GRAVEL: Light grey,fine to coarse grained sand, angular to subangular gravel	Nf				3						
	171.3	1.0				Gravelly Silty SAND: Grey, dark grey mixed, fine to coarse grained sand, fine to coarse gravel, rounded to subrounded	Nf										
	170.8	1.5															
	170.3	2.0															
	169.8	2.5															
	169.3	3.0				SANDY SILT, with GRAVEL, with COBBLES: Fine to medium grained sand, fine to coarse gravel, rounded to subrounded	Nf										
	168.8	3.5		[3.6]													
	168.3	4.0				Drilling Refusal. **Drillhole BH16-R028 terminated at 3.6m.**											
	167.8	4.5															
	167.3	5.0															

Notes:

BOREHOLE REPORT

BH16-R029
Sheet 1 of 1

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Easting: 525,062.0 m
Northing: 7,938,851.0 m
Surface Elevation: 186.00 m
Bottom Elevation: 183.00 m
Total Depth: 3.0 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 10/11/2016
Driller: Samuel Flynn
Hole Diameter (mm): 96
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	185.5	0.5	Vibracore	H-Casing		SANDY SILT and GRAVEL, trace COBBLES: Light brown, subangular to angular gravel, fine to coarse sand, fine to coarse gravel	Nf										
	185.0	1.0															
	184.5	1.5				GRAVEL and COBBLES, some SAND: Grey, subgranular to angular gravel, fine to coarse, fine to coarse grained sand	Nf										
	184.0	2.0															
	183.5	2.5															
	183.0	3.0		[3.0]		Drilling Refusal. **Drillhole BH16-R029 terminated at 3.0m.**											
	182.5	3.5															
	182.0	4.0															
	181.5	4.5															
	181.0	5.0															

Notes:

BOREHOLE REPORT

BH16-R030

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion

Location: Mary River

Project No.: H352034

Datum: NAD83

Platform:

Easting: 525,291.0 m

Northing: 7,937,897.0 m

Surface Elevation: 178.75 m

Bottom Elevation: 175.15 m

Total Depth: 3.6 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/11/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	178.3	0.5	Vibracore	H-Casing		SAND with SILT, with GRAVEL: Brown, angular to subangular gravel	Nf										
	177.8	1.0				SANDY SILT, with GRAVEL, with COBBLES: Grey, angular to subangular gravel	Nf										
	177.3	1.5															
	176.8	2.0				Pulverized rock with fragments of rocks, angular, sharp edges	Nf										
	176.3	2.5									10						
	175.8	3.0															
	175.3	3.5		[3.6]													
	174.8	4.0				Drilling Refusal. **Drillhole BH16-R030 terminated at 3.6m.**											
	174.3	4.5															
	173.8	5.0															

Notes:

BOREHOLE REPORT

BH16-R032

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 525,991.0 m

Northing: 7,936,109.0 m

Surface Elevation: 168.75 m

Bottom Elevation: 166.05 m

Total Depth: 2.7 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/11/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	168.3	0.5	Vibracore	H-Casing		SILTY SAND, some GRAVEL, some COBBLES: Brown to grey, fine to coarse grained sand											
	167.8	1.0															
	167.3	1.5				LIMESTONE: Pulverized rock, white to grey, angular rock fragments, weak to moderate strength											
	166.8	2.0															
	166.3	2.5		[2.7]													
	165.8	3.0				Drilling Refusal. **Drillhole BH16-R032 terminated at 2.7m.**											
	165.3	3.5															
	164.8	4.0															
	164.3	4.5															
	163.8	5.0															

Notes:

BOREHOLE REPORT

BH16-R033

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 526,653.0 m

Northing: 7,935,439.0 m

Surface Elevation: 164.00 m

Bottom Elevation: 159.80 m

Total Depth: 4.2 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/11/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	163.5	0.5	Vibracore	H-Casing		GRAVEL, some SILT, some SAND: Light brown, medium to coarse grained sand, subrounded to rounded gravel	Nf										
	163.0	1.0															
	162.5	1.5				SAND and GRAVEL, with SILT, trace COBBLES: Grey, fine to coarse gravel, fine to coarse grained sand, rounded to subrounded gravel	Nf										
	162.0	2.0															
	161.5	2.5									7						
	161.0	3.0				COBBLES, with GRAVEL, with SAND, trace SILT: Light brown, grey mixed, coarse gravel, angular to subangular, fine to medium grained sand	Nf										
	160.5	3.5															
	160.0	4.0		[4.2]													
	159.5	4.5				To Target Depth. **Drillhole BH16-R033 terminated at 4.2m.**											
	159.0	5.0															

Notes:

BOREHOLE REPORT

BH16-R034
Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 527,056.0 m
Northing: 7,933,500.0 m
Surface Elevation: 175.60 m
Bottom Elevation: 171.10 m
Total Depth: 4.5 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Samuel Flynn
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 10/12/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	175.1	0.5	Vibracore	H-Casing		SAND and GRAVEL, trace silt: Light brown, grey mixed, fine to coarse grained sand, rounded	Nf										
	174.6	1.0															
	174.1	1.5				GRAVELLY SILTY SAND: Light brown, grey mixed, angular to subangular gravel, fine to coarse grained sand	Vx										
	173.6	2.0															
	173.1	2.5									8	27	40	32			
	172.6	3.0															
	172.1	3.5									9						
	171.6	4.0															
	171.1	4.5		[4.5]		To Target Depth. **Drillhole BH16-R034 terminated at 4.5m.**											
	170.6	5.0															

Notes:

BOREHOLE REPORT

BH16-R035
Sheet 1 of 1

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Easting: 527,423.0 m
Northing: 7,932,310.0 m
Surface Elevation: 186.00 m
Bottom Elevation: 181.40 m
Total Depth: 4.6 m
Logged By: UK
Reviewed By: SH/WH

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 10/12/2016
Driller: Vance Madden
Hole Diameter (mm): 96
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved	185.5	0.5	Vibracore	H-Casing		SAND, with GRAVEL, with SILT: Grey to brown, angular to subangular gravel	Nf										
	185.0	1.0				GRAVEL, with SAND, with COBBLES: Brown, rounded to subrounded gravel	Nf										
	184.5	1.5				SAND and GRAVEL, some SILT: Grey, fine grained sand	Nf										
	184.0	2.0				GRAVELLY SILTY SAND: Grey	Nbn										
	183.5	2.5										24	42	34			
	183.0	3.0															
	182.5	3.5															
	182.0	4.0				LIMESTONE: Framnebted rock, light grey to white, pulverized, angular, sharp edges											
	181.5	4.5		[4.6]													
	181.0	5.0				To Target Depth. **Drillhole BH16-R035 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R036

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 527,210.0 m

Northing: 7,931,660.0 m

Surface Elevation: 172.00 m

Bottom Elevation: 167.40 m

Total Depth: 4.6 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/12/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	171.5	0.5	Vibracore	H-Casing		Gravelly SAND, some SILT, trace COBBLES: Organic, grey to brown, angular to subangular gravel	Nf										
	171.0	1.0															
	170.5	1.5				SAND and SILT, with GRAVEL trace COBBLES: Brown to grey, angular to subangular gravel	Nf										
	170.0	2.0															
	169.5	2.5									10	23	42	35			
	169.0	3.0				SILT and COBBLES, with SAND: Brown	Nf										
	168.5	3.5															
	168.0	4.0															
	167.5	4.5		[4.6]													
	167.0	5.0				To Target Depth. **Drillhole BH16-R036 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R037

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 527,873.0 m

Northing: 7,929,786.0 m

Surface Elevation: 162.25 m

Bottom Elevation: 157.65 m

Total Depth: 4.6 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/12/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	161.8	0.5	Vibracore	H-Casing		SAND, trace SILT: Reddish brown, angular	Nf										
	161.3	1.0															
	160.8	1.5					Nbn										
	160.3	2.0															
	159.8	2.5									20	0	91	9			
	159.3	3.0															
	158.8	3.5															
	158.3	4.0									20						
	157.8	4.5		[4.6]													
	157.3	5.0				To Target Depth. **Drillhole BH16-R037 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R038

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 528,501.0 m

Northing: 7,928,421.0 m

Surface Elevation: 164.00 m

Bottom Elevation: 159.50 m

Total Depth: 4.5 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/12/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	163.5	0.5	Vibracore	H-Casing		SAND, trace SILT, trace GRAVEL: Light brown, reddish brown mixed, medium to coarse grained sand, rounded to subrounded gravel	Nf										
	163.0	1.0															
	162.5	1.5					Vc										
	162.0	2.0									16	2	89	9			
	161.5	2.5															
	161.0	3.0															
	160.5	3.5															
	160.0	4.0									8						
	159.5	4.5		[4.5]		To Target Depth. **Drillhole BH16-R038 terminated at 4.5m.**											
	159.0	5.0															

Notes:

BOREHOLE REPORT

BH16-R039

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 528,666.0 m

Northing: 7,927,955.0 m

Surface Elevation: 165.75 m

Bottom Elevation: 161.25 m

Total Depth: 4.5 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/12/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost.	165.3	0.5	Vibracore	H-Casing		SAND, trace SILT, trace GRAVEL: Light brown, reddish brown mixed, medium to coarse grained sand, rounded to subrounded gravel	Nf										
	164.8	1.0									20	3	94	3			
	164.3	1.5					Nbn										
	163.8	2.0															
	163.3	2.5															
	162.8	3.0															
	162.3	3.5															
	161.8	4.0															
	161.3	4.5		[4.5]		To Target Depth. **Drillhole BH16-R039 terminated at 4.5m.**											
	160.8	5.0															

Notes:

BOREHOLE REPORT

BH16-R040

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 528,686.0 m

Northing: 7,927,755.0 m

Surface Elevation: 166.00 m

Bottom Elevation: 161.40 m

Total Depth: 4.6 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/13/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost.	165.5	0.5	Vibracore	H-Casing		SAND and SILT, trace GRAVEL: Reddish brown to grey, angular to subangular gravel	Nf										
	165.0	1.0															
	164.5	1.5															
	164.0	2.0															
	163.5	2.5									19						
	163.0	3.0															
	162.5	3.5															
	162.0	4.0															
	161.5	4.5		[4.6]													
	161.0	5.0				To Target Depth. **Drillhole BH16-R040 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R041

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 528,605.0 m

Northing: 7,927,754.0 m

Surface Elevation: 166.00 m

Bottom Elevation: 164.50 m

Total Depth: 1.5 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/14/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost.	165.5	0.5	Vibracore	H-Casing		SAND: Reddish brown, fine to coarse grained sand											
	165.0	1.0															
	164.5	1.5		[1.5]		To Target Depth. **Drillhole BH16-R041 terminated at 1.5m.**											
	164.0	2.0															
	163.5	2.5															
	163.0	3.0															
	162.5	3.5															
	162.0	4.0															
	161.5	4.5															
	161.0	5.0															

Notes:

BOREHOLE REPORT

BH16-R042

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 528,517.0 m

Northing: 7,927,713.0 m

Surface Elevation: 167.00 m

Bottom Elevation: 162.50 m

Total Depth: 4.5 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/14/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost.	166.5	0.5	Vibracore	H-Casing		SAND, trace GRAVEL: Reddish brown, light brown mixed, medium to coarse grained sand, angular to subangular gravel,	Nf										
	166.0	1.0															
	165.5	1.5															
	165.0	2.0															
	164.5	2.5															
	164.0	3.0				3.30 m to 4.60 m: Trace to some gravel	Nbn										
	163.5	3.5															
	163.0	4.0									15						
	162.5	4.5		[4.5]		To Target Depth. **Drillhole BH16-R042 terminated at 4.5m.**											
	162.0	5.0															

Notes:

BOREHOLE REPORT

BH16-R043

Sheet 1 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 528,428.0 m

Northing: 7,927,675.0 m

Surface Elevation: 167.00 m

Bottom Elevation: 158.00 m

Total Depth: 9.0 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/13/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost.	166.5	0.5	Vibracore	H-Casing		SAND: Grey to light brown, fine to coarse grained	Nf										
	166.0	1.0															
	165.5	1.5															
	165.0	2.0															
	164.5	2.5															
	164.0	3.0					Vc										
	163.5	3.5															
	163.0	4.0									15						
	162.5	4.5				4.50 m to 7.50m: Trace gravel	Nf										
	162.0	5.0															

Notes:

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BOREHOLE REPORT

BH16-R043

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 528,428.0 m

Northing: 7,927,675.0 m

Surface Elevation: 167.00 m

Bottom Elevation: 158.00 m

Total Depth: 9.0 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/13/2016

Driller: Samuel Flynn

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	161.5	5.5				SAND: Grey to light brown, fine to coarse grained *(Continued)*	Nf *(Continued)*										
	161.0	6.0															
	160.5	6.5															
	160.0	7.0															
	159.5	7.5				7.50 m to 9.00 m: Light brown, fine to medium grained sand, no gravel	Nf										
	159.0	8.0															
	158.5	8.5									7						
	158.0	9.0		[9.0]		To Target Depth. **Drillhole BH16-R043 terminated at 9.0m.**											
	157.5	9.5															
	157.0	10.0															

Notes:

BOREHOLE REPORT

BH16-R044
Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 528,736.0 m
Northing: 7,926,992.0 m
Surface Elevation: 167.00 m
Bottom Elevation: 162.50 m
Total Depth: 4.5 m
Logged By: CS
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Vance Madden
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 10/28/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	166.5	0.5	Vibracore	H-Casing		SANDY GRAVEL, trace COBBLES: Light brown, fine to coarse gravel , angular to subangular gravel											
	166.0	1.0															
	165.5	1.5				SAND, some SILT, some GRAVEL: Light brown, rounded to subrounded gravel, medium to coarse grained sand											
	165.0	2.0									11						
	164.5	2.5															
	164.0	3.0															
	163.5	3.5															
	163.0	4.0									16						
	162.5	4.5		[4.5]		To Target Depth. **Drillhole BH16-R044 terminated at 4.5m.**											
	162.0	5.0															

Notes:

BOREHOLE REPORT

BH16-R045

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 528,961.0 m

Northing: 7,926,756.0 m

Surface Elevation: 138.75 m

Bottom Elevation: 134.25 m

Total Depth: 4.5 m

Logged By: CS

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/28/2016

Driller: Vance Madden

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	138.3	0.5	Vibracore	H-Casing		SAND, some SILT, some GRAVEL, trace COBBLES: Light brown, medium to coarse grained sand											
	137.8	1.0									8						
	137.3	1.5															
	136.8	2.0															
	136.3	2.5															
	135.8	3.0															
	135.3	3.5									21						
	134.8	4.0															
	134.3	4.5		[4.5]		To Target Depth. **Drillhole BH16-R045 terminated at 4.5m.**											
	133.8	5.0															

Notes:

BOREHOLE REPORT

BH16-R046

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 529,065.0 m

Northing: 7,926,599.0 m

Surface Elevation: 138.20 m

Bottom Elevation: 133.60 m

Total Depth: 4.6 m

Logged By: RS

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/28/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	137.7	0.5	Vibracore	H-Casing		SAND, some GRAVEL, trace SILT: Light brown, subrounded to rounded gravel, medium to coarse grained sand	Nf										
	137.2	1.0				SAND and GRAVEL, trace SILT: Fine to medium grained sand	Nf				6						
	136.7	1.5				SILT: Organics, peat, dark brown, black, organic odour, frozen	Nbn										
	136.2	2.0									40						
	135.7	2.5															
	135.2	3.0				SILTY SAND: Grey, fine to medium grained sand, brown layers	Nbn										
	134.7	3.5															
	134.2	4.0									22						
	133.7	4.5		[4.6]													
	133.2	5.0				To Target Depth. **Drillhole BH16-R046 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R053

Sheet 1 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 528,238.0 m

Northing: 7,928,027.0 m

Surface Elevation: 163.25 m

Bottom Elevation: 157.20 m

Total Depth: 6.1 m

Logged By: RS

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/28/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	162.8	0.5	Vibracore	H-Casing		SAND, trace SILT, trace GRAVEL: Light grey to brown, medium to coarse grained sand	Nf										
	162.3	1.0															
	161.8	1.5					Nbn										
	161.3	2.0															
	160.8	2.5															
	160.3	3.0															
	159.8	3.5															
	159.3	4.0															
	158.8	4.5															
	158.3	5.0															

Notes:

BOREHOLE REPORT

BH16-R053

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 528,238.0 m

Northing: 7,928,027.0 m

Surface Elevation: 163.25 m

Bottom Elevation: 157.20 m

Total Depth: 6.1 m

Logged By: RS

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/28/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	157.8	5.5				SAND, trace SILT, trace GRAVEL: Light grey to brown, medium to coarse grained sand *(Continued)*	Nf *(Continued)*										
						5.50 m to 6.10 m: Fine to medium grained sand	Nf				23						
	157.3	6.0		[6.1]		To Target Depth. **Drillhole BH16-R053 terminated at 6.1m.**											
	156.8	6.5															
	156.3	7.0															
	155.8	7.5															
	155.3	8.0															
	154.8	8.5															
	154.3	9.0															
	153.8	9.5															
	153.3	10.0															

Notes:

BOREHOLE REPORT

BH16-R067
Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 535,406.0 m
Northing: 7,918,572.0 m
Surface Elevation: 189.00 m
Bottom Elevation: 184.40 m
Total Depth: 4.6 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Michael Scott
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 11/24/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	188.5	0.5	Vibracore	H-Casing		PEAT, with SAND, with GRAVEL, trace COBBLES: Dark brown to black, Organic, medium to coarse grained sand, rounded to subrounded cobbles	Nf										
	188.0	1.0				SAND, trace GRAVEL, trace COBBLES: Dark grey to dark brown, medium to coarse grained sand, rounded to subrounded cobbles	Nf				16	3	60	37			
	187.5	1.5															
	187.0	2.0															
	186.5	2.5															
	186.0	3.0															
	185.5	3.5															
	185.0	4.0															
	184.5	4.5		[4.6]													
	184.0	5.0				To Target Depth. **Drillhole BH16-R067 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R068
Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 537,046.0 m
Northing: 7,919,096.0 m
Surface Elevation: 183.50 m
Bottom Elevation: 178.90 m
Total Depth: 4.6 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Michael Scott
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 11/24/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	183.0	0.5	Vibracore	H-Casing		GRAVELLY SAND, trace SILT: Light brown, fine to coarse grained sand, angular to subangular gravel	Vx										
	182.5	1.0									42						
	182.0	1.5				SAND: Light brown to yellowish grey, fine to medium grained sand	Vx										
	181.5	2.0									15						
	181.0	2.5															
	180.5	3.0				SAND, trace SILT, trace GRAVEL: Dark brown, Organic, fine to medium grained sand	Vx										
	180.0	3.5															
	179.5	4.0															
	179.0	4.5		[4.6]													
	178.5	5.0				To Target Depth. **Drillhole BH16-R068 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R069

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 539,489.0 m

Northing: 7,920,583.0 m

Surface Elevation: 152.00 m

Bottom Elevation: 147.40 m

Total Depth: 4.6 m

Logged By: UK

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/23/2016

Driller: E.Beachamp

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	151.5	0.5	Vibracore	H-Casing		Sandy SILT, with GRAVEL, with COBBLES: White to grey, fine grained sand, angular to subangular gravel											
	151.0	1.0									21	19	41	40			
	150.5	1.5															
	150.0	2.0															
	149.5	2.5															
	149.0	3.0															
	148.5	3.5															
	148.0	4.0															
	147.5	4.5		[4.6]													
	147.0	5.0				To Target Depth. **Drillhole BH16-R069 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH16-R070

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 540,273.0 m

Northing: 7,921,201.0 m

Surface Elevation: 146.00 m

Bottom Elevation: 141.40 m

Total Depth: 4.6 m

Logged By: MR

Reviewed By: SH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/23/2016

Driller: Michael Scott

Hole Diameter (mm): 96

Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	145.5	0.5	Vibracore	H-Casing		PEAT, GRAVELLY SAND: Brown, coarse grained sand	Nf										
	145.0	1.0				SAND, trace GRAVEL: Brown to light brown, fine to medium grained sand, angular to subangular gravel	Nf				8	0	84	16			
	144.5	1.5				1.50 m to 3.00 m: Light brown, some silt	Vx										
	144.0	2.0															
	143.5	2.5															
	143.0	3.0					Nf										
	142.5	3.5															
	142.0	4.0															
	141.5	4.5		[4.6]													
	141.0	5.0				To Target Depth. **Drillhole BH16-R070 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH17-B001
Sheet 1 of 4

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 529,031.0 m
Northing: 7,916,747.0 m
Surface Elevation: 125.00 m
Bottom Elevation: 108.50 m
Total Depth: 16.5 m
Logged By: UK
Reviewed By: CH/WH

Contractor: Boart Longyear
Driller: Emile and/or Sam
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 100
Date Logged: 4/22/2017
Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 / 50 / 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	124.5	0.5	Sonic Drilling	NO CASING		SILTY SAND: Brown, fine grained sand	Nf										
	124.0	1.0															
	123.5	1.5				SAND, trace SILT: Grey, fine grained sand	Nbn										
	123.0	2.0															
	122.5	2.5									26	0	93	7			
	122.0	3.0															
	121.5	3.5															
	121.0	4.0															
	120.5	4.5															
	120.0	5.0		[5.0]		SILT, trace SAND: Black organics, fine grained sand	Nbn										

Notes:

HATCH BOREHOLE REPORT

BH17-B001

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 529,031.0 m
Northing: 7,916,747.0 m
Surface Elevation: 125.00 m
Bottom Elevation: 108.50 m
Total Depth: 16.5 m
Logged By: UK
Reviewed By: CH/WH

Contractor: Boart Longyear
Driller: Emile and/or Sam
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 100
Date Logged: 4/22/2017
Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	119.5	5.5	Sonic Drilling	NO CASING		SILT, trace SAND: Black organics, fine grained sand *(Continued)*	Nbn *(Continued)*										
	119.0	6.0					Vs				37	0	6	94			
	118.5	6.5															
	118.0	7.0															
	117.5	7.5				SILTY SAND, trace GRAVEL, trace COBBLES: Dark grey, fine to medium grained, well graded sand; multi-coloured, fine to coarse, rounded cobbles	Vx										
	117.0	8.0															
	116.5	8.5				8.80 m: Inferred boulders					10	6	65	29			
	116.0	9.0				SILT with SAND, trace GRAVEL: Dark grey, fine to coarse grained, well graded sand; multi-coloured, fine to coarse, rounded gravel											
	115.5	9.5															
	115.0	10.0		[10.0]													

Notes:

BOREHOLE REPORT

BH17-B001
Sheet 3 of 4

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 529,031.0 m
Northing: 7,916,747.0 m
Surface Elevation: 125.00 m
Bottom Elevation: 108.50 m
Total Depth: 16.5 m
Logged By: UK
Reviewed By: CH/WH

Contractor: Boart Longyear
Driller: Emile and/or Sam
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 100
Date Logged: 4/22/2017
Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	114.5	10.5	Sonic Drilling	NO CASING		SILT with SAND, trace GRAVEL: Dark grey, fine to coarse grained, well graded sand; multi-coloured, fine to coarse, rounded gravel *(Continued)*	Vc										
	114.0	11.0				11.00 m to 12.00 m: Large sub-angular cobbles (~ 10 cm) or possible boulders	Vx										
	113.5	11.5									42	7	30	63			
	113.0	12.0					Nf										
						12.20 m: Inferred boulder											
	112.5	12.5															
						12.80 m: Grey, inferred boulder											
	112.0	13.0									12						
	111.5	13.5															
						13.70 m to 16.50 m: Grey, fine grained sand; multi-coloured, fine, rounded gravel											
	111.0	14.0															
	110.5	14.5															
	110.0	15.0		[15.0]													

Notes:

BOREHOLE REPORT

BH17-B001

Sheet 4 of 4

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 529,031.0 m

Northing: 7,916,747.0 m

Surface Elevation: 125.00 m

Bottom Elevation: 108.50 m

Total Depth: 16.5 m

Logged By: UK

Reviewed By: CH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 4/22/2017

Driller: Emile and/or Sam

Hole Diameter (mm): 100

Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	109.5	15.5	Sonic Drilling	NO CASING		SILT with SAND, trace GRAVEL: Dark grey, fine to coarse grained, well graded sand; multi-coloured, fine to coarse, rounded gravel *(Continued)*					12						
	109.0	16.0															
	108.5	16.5		[16.5]		Drilling Refusal. **Drillhole BH17-B001 terminated at 16.5m.**											
	108.0	17.0															
	107.5	17.5															
	107.0	18.0															
	106.5	18.5															
	106.0	19.0															
	105.5	19.5															
	105.0	20.0															

Notes:

BOREHOLE REPORT

BH17-B002

Sheet 1 of 6

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 529,323.0 m

Northing: 7,916,577.0 m

Surface Elevation: 125.00 m

Bottom Elevation: 99.40 m

Total Depth: 25.6 m

Logged By: AB

Reviewed By: CH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 4/18/2017

Driller: Emile and/or Sam

Hole Diameter (mm): 100

Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	125.0	0.0	Sonic Drilling	NO CASING		SAND, some SILT: Brown, medium to fine grained, well graded sand											
	124.5	0.5									19	0	88	12			
	124.0	1.0															
	123.5	1.5															
	123.0	2.0															
	122.5	2.5															
	122.0	3.0				ORGANIC SILT, some SAND: Black, fine grained sand with strong organic odour.	Nbn										
	121.5	3.5									37	0	16	84			
	121.0	4.0					Nbe										
	120.5	4.5					Nbn										
	120.0	5.0		[5.0]			Vx										

Notes:

HATCH BOREHOLE REPORT

BH17-B002

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 529,323.0 m
Northing: 7,916,577.0 m
Surface Elevation: 125.00 m
Bottom Elevation: 99.40 m
Total Depth: 25.6 m
Logged By: AB
Reviewed By: CH/WH

Contractor: Boart Longyear
Driller: Emile and/or Sam
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 100
Date Logged: 4/18/2017
Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	119.5	5.5	Sonic Drilling	NO CASING		ORGANIC SILT, some SAND: Black, fine grained sand with strong organic odour. *(Continued)*	Nbn *(Continued)*										
	119.0	6.0				SILTY and SAND: Brown, fine to coarse grained, well graded sand	Nf										
	118.5	6.5									24	0	48	52			
	118.0	7.0															
	117.5	7.5															
	117.0	8.0					Nbe										
	116.5	8.5															
	116.0	9.0				9.10 m to 12.20 m: Black, medium to fine grained, well graded sand; multicoloured, rounded to subrounded gravel	Nf										
	115.5	9.5															
	115.0	10.0		[10.0]													

Notes:

BOREHOLE REPORT

BH17-B002
Sheet 3 of 6

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 529,323.0 m
Northing: 7,916,577.0 m
Surface Elevation: 125.00 m
Bottom Elevation: 99.40 m
Total Depth: 25.6 m
Logged By: AB
Reviewed By: CH/WH

Contractor: Boart Longyear
Driller: Emile and/or Sam
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 100
Date Logged: 4/18/2017
Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	114.5	10.5	Sonic Drilling	NO CASING		SILTY and SAND: Brown, fine to coarse grained, well graded sand *(Continued)*	Nf *(Continued)*										
	114.0	11.0															
	113.5	11.5								●	9	3	66	32			
	113.0	12.0															
	112.5	12.5				SAND, some SILT, trace to some GRAVEL: Brown, fine to coarse grained, poorly graded sand											
	112.0	13.0															
	111.5	13.5															
	111.0	14.0															
	110.5	14.5															
	110.0	15.0		[15.0]													

Notes:

HATCH BOREHOLE REPORT

BH17-B002
Sheet 4 of 6

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 529,323.0 m
Northing: 7,916,577.0 m
Surface Elevation: 125.00 m
Bottom Elevation: 99.40 m
Total Depth: 25.6 m
Logged By: AB
Reviewed By: CH/WH

Contractor: Boart Longyear
Driller: Emile and/or Sam
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 100
Date Logged: 4/18/2017
Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	109.5	15.5	Sonic Drilling	NO CASING		SAND, some SILT, trace to some GRAVEL: Brown, fine to coarse grained, poorly graded sand *(Continued)*											
	109.0	16.0									11	10	70	20			
	108.5	16.5															
	108.0	17.0															
	107.5	17.5					Nbe										
	107.0	18.0															
	106.5	18.5				18.60 m to 19.80 m: Some GRAVEL: Multi-coloured, well graded; rounded gravel	Nf				8	15	66	20			
	106.0	19.0															
	105.5	19.5															
	105.0	20.0		[20.0]		19.80 m to 21.30 m: Dark brown, fine to coarse grained, well graded sand; fine	Nf										

Notes:

HATCH BOREHOLE REPORT

BH17-B002

Sheet 5 of 6

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 529,323.0 m
Northing: 7,916,577.0 m
Surface Elevation: 125.00 m
Bottom Elevation: 99.40 m
Total Depth: 25.6 m
Logged By: AB
Reviewed By: CH/WH

Contractor: Boart Longyear
Driller: Emile and/or Sam
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 100
Date Logged: 4/18/2017
Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	104.5	20.5	Sonic Drilling	NO CASING		to coarse gravel SAND, some SILT, trace to some GRAVEL: Brown, fine to coarse grained, poorly graded sand *(Continued)*	Nbn										
	104.0	21.0															
	103.5	21.5				21.30 m to 24.40 m: SILTY SAND, trace GRAVEL: Brown, fine grained sand	Nf										
	103.0	22.0															
	102.5	22.5															
	102.0	23.0															
	101.5	23.5								●	15	1	72	27			
	101.0	24.0															
	100.5	24.5				Inferred BEDROCK, grey, rock flour, Granitic											
	100.0	25.0		[25.0]													

Notes:

BOREHOLE REPORT

BH17-B002

Sheet 6 of 6

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 529,323.0 m

Northing: 7,916,577.0 m

Surface Elevation: 125.00 m

Bottom Elevation: 99.40 m

Total Depth: 25.6 m

Logged By: AB

Reviewed By: CH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 4/18/2017

Driller: Emile and/or Sam

Hole Diameter (mm): 100

Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	99.5	25.5	Sonic Drilling	NO CASING [25.6]		Inferred BEDROCK, grey, rock flour, Granitic *(Continued)*											
						Drilling Refusal. **Drillhole BH17-B002 terminated at 25.6m.**											
	99.0	26.0															
	98.5	26.5															
	98.0	27.0															
	97.5	27.5															
	97.0	28.0															
	96.5	28.5															
	96.0	29.0															
	95.5	29.5															
	95.0	30.0															

Notes:

BOREHOLE REPORT

BH17-C001
Sheet 1 of 2

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 509,838.0 m
Northing: 7,967,861.0 m
Surface Elevation: 74.00 m
Bottom Elevation: 65.80 m
Total Depth: 8.2 m
Logged By: AB
Reviewed By: CH/WH

Contractor: Boart Longyear
Driller: Emile and/or Sam
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 100
Date Logged: 4/13/2017
Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	73.5	0.5	Sonic Drilling	NO CASING		ORGANICS: Brown, fine grained, black mottling											
	73.0	1.0				GRAVELLY SAND, some COBBLES: Grey, well graded, fine grained sand; Coarse, rounded to subrounded gravel											
	72.5	1.5				SAND: Multi-coloured, coarse grained, poorly graded	Nf										
	72.0	2.0				2.10 m: Black mottling											
	71.5	2.5															
	71.0	3.0				SAND and SILT, some GRAVEL: Reddish brown, poorly graded, coarse grained sand; coarse, rounded gravel	Nf			●	7	14	49	37			
	70.5	3.5				3.40 m to 3.70 m: Inferred cobbles											
	70.0	4.0				3.70 m to 6.10 m: Grey, coarse grained, well graded sand; rounded to sub-angular, coarse gravel	Nf										
	69.5	4.5															
	69.0	5.0		[5.0]													

Notes:

BOREHOLE REPORT

BH17-C001

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 509,838.0 m

Northing: 7,967,861.0 m

Surface Elevation: 74.00 m

Bottom Elevation: 65.80 m

Total Depth: 8.2 m

Logged By: AB

Reviewed By: CH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 4/13/2017

Driller: Emile and/or Sam

Hole Diameter (mm): 100

Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	68.5	5.5	Sonic Drilling	NO CASING		SAND and SILT, some GRAVEL: Reddish brown, poorly graded, coarse grained sand; coarse, rounded gravel *(Continued)* 5.20 m to 5.80 m: Inferred cobbles	Nf *(Continued)*										
	68.0	6.0				6.10 m to 7.60 m: No gravel encountered, light brown, fine to coarse grained sand	Nf										
	67.5	6.5															
	67.0	7.0									3	0	48	52			
	66.5	7.5				7.30 m: Inferred cobbles 7.60 m to 8.20 m: Grey, fine grained Sand; well-graded, rounded gravel											
	66.0	8.0		[8.2]													
	65.5	8.5				Drilling Refusal. **Drillhole BH17-C001 terminated at 8.2m.**											
	65.0	9.0															
	64.5	9.5															
	64.0	10.0															

Notes:

BOREHOLE REPORT

BH17-C002

Sheet 1 of 3

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 519,532.0 m

Northing: 7,957,667.0 m

Surface Elevation: 116.00 m

Bottom Elevation: 105.30 m

Total Depth: 10.7 m

Logged By: UK

Reviewed By: CH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 4/13/2017

Driller: Emile and/or Sam

Hole Diameter (mm): 100

Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	115.5	0.5	Sonic Drilling	NO CASING		SAND, trace GRAVEL: Brown, fine to medium grained sand; coarse, rounded gravel	Nf										
	115.0	1.0				COBBLES and BOULDERS, some SAND, trace GRAVEL: White, subangular cobbles; Inferred boulders	Nf										
	114.5	1.5				GRAVELLY SAND, some SILT: Grey, fine to coarse grained sand; coarse gravel	Nf										
	114.0	2.0															
	113.5	2.5									10	22	59	19			
	113.0	3.0				ICE: Clear to cloudy texture 3.00 m to 9.10 m: White cloudy texture	ICE										
	112.5	3.5															
	112.0	4.0															
	111.5	4.5															
	111.0	5.0		[5.0]													

Notes:

BOREHOLE REPORT

BH17-C002
Sheet 2 of 3

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Easting: 519,532.0 m
Northing: 7,957,667.0 m
Surface Elevation: 116.00 m
Bottom Elevation: 105.30 m
Total Depth: 10.7 m
Logged By: UK
Reviewed By: CH/WH

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 4/13/2017
Driller: Emile and/or Sam
Hole Diameter (mm): 100
Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	110.5	5.5	Sonic Drilling	NO CASING		ICE: Clear to cloudy texture *(Continued)*	ICE *(Continued)*										
	110.0	6.0															
	109.5	6.5															
	109.0	7.0															
	108.5	7.5															
	108.0	8.0															
	107.5	8.5				8.80 m to 9.10 m: Ice with silt Inclusions											
	107.0	9.0															
	106.5	9.5															
	106.0	10.0		[10.0]													

Notes:

BOREHOLE REPORT

BH17-C002

Sheet 3 of 3

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 519,532.0 m

Northing: 7,957,667.0 m

Surface Elevation: 116.00 m

Bottom Elevation: 105.30 m

Total Depth: 10.7 m

Logged By: UK

Reviewed By: CH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 4/13/2017

Driller: Emile and/or Sam

Hole Diameter (mm): 100

Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	105.5	10.5	Sonic Drilling	NO CASING [10.7]		ICE: Clear to cloudy texture *(Continued)*	ICE *(Continued)*										
	105.0	11.0				To Target Depth. **Drillhole BH17-C002 terminated at 10.7m.**											
	104.5	11.5															
	104.0	12.0															
	103.5	12.5															
	103.0	13.0															
	102.5	13.5															
	102.0	14.0															
	101.5	14.5															
	101.0	15.0															

Notes:

HATCH BOREHOLE REPORT

BH17-C003

Sheet 1 of 2

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Easting: 520,130.0 m
Northing: 7,957,541.0 m
Surface Elevation: 118.25 m
Bottom Elevation: 109.15 m
Total Depth: 9.1 m
Logged By: UK/AB
Reviewed By: CH/WH

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 4/14/2017
Driller: Emile and/or Sam
Hole Diameter (mm): 100
Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	118.25	0.0	Sonic Drilling	NO CASING		SILTY SAND: Brown, fine to medium grained sand											
	117.8	0.5				Inferred BOULDERS, GRAVELLY SAND: Brown, coarse grained sand; Fine to coarse, rounded to sub-angular gravel											
	117.3	1.0															
	116.8	1.5															
	116.3	2.0															
	115.8	2.5															
	115.3	3.0				GRAVELLY SILTY SAND: Grey, coarse grained, poorly graded sand; Multi-coloured, coarse, rounded gravel					7	33	46	21			
	114.8	3.5															
	114.3	4.0				4.00 m to 4.60 m: Inferred boulders											
	113.8	4.5															
	113.3	5.0		[5.0]		SILTY SAND, trace GRAVEL: Light brown, well graded sand	Nf										

Notes:

HATCH BOREHOLE REPORT

BH17-C003

Sheet 2 of 2

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 520,130.0 m
Northing: 7,957,541.0 m
Surface Elevation: 118.25 m
Bottom Elevation: 109.15 m
Total Depth: 9.1 m
Logged By: UK/AB
Reviewed By: CH/WH

Contractor: Boart Longyear
Driller: Emile and/or Sam
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 100
Date Logged: 4/14/2017
Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	112.8	5.5	Sonic Drilling	NO CASING		SILTY SAND, trace GRAVEL: Light brown, well graded sand *(Continued)*	Nf *(Continued)*				24	4	73	23			
	112.3	6.0				6.10 m to 9.10 m: Some cobbles, rounded to sub-rounded, multi-coloured, up to 10 cm diamater											
	111.8	6.5															
	111.3	7.0															
	110.8	7.5															
	110.3	8.0				7.90 m: Sand changes from light brown to reddish											
	109.8	8.5															
	109.3	9.0									9	9	57	34			
	108.8	9.5				To Target Depth. **Drillhole BH17-C003 terminated at 9.1m.**											
	108.3	10.0		[10.0]													

Notes:

BOREHOLE REPORT

BH17-C004

Sheet 1 of 3

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 520,486.0 m

Northing: 7,956,367.0 m

Surface Elevation: 116.30 m

Bottom Elevation: 105.60 m

Total Depth: 10.7 m

Logged By: AB

Reviewed By: CH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 4/14/2017

Driller: Emile and/or Sam

Hole Diameter (mm): 100

Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	115.8	0.5	Sonic Drilling	NO CASING		SAND, some SILT, trace GRAVEL: Grey, well graded, sand; Fine to coarse, rounded to sub-rounded gravel											
	115.3	1.0															
	114.8	1.5															
						1.80 m to 3.0 m: Some cobbles											
	114.3	2.0															
	113.8	2.5															
	113.3	3.0				SILTY SAND: Light brown, fine to coarse grained, poorly graded sand	Nf										
						3.40 m: Inferred boulder											
	112.8	3.5															
	112.3	4.0															
						4.30 m: Inferred boulder											
	111.8	4.5					Vx										
	111.3	5.0		[5.0]													

Notes:

HATCH BOREHOLE REPORT

BH17-C004

Sheet 2 of 3

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 4/14/2017
Driller: Emile and/or Sam
Hole Diameter (mm): 100
Date Reviewed: 6/8/2017

Easting: 520,486.0 m
Northing: 7,956,367.0 m
Surface Elevation: 116.30 m
Bottom Elevation: 105.60 m
Total Depth: 10.7 m
Logged By: AB
Reviewed By: CH/WH

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	110.8	5.5	Sonic Drilling	NO CASING		SILTY SAND: Light brown, fine to coarse grained, poorly graded sand *(Continued)*	Nf *(Continued)*										
	110.3	6.0															
	109.8	6.5															
	109.3	7.0				7.20 m: Inferred Boulder					30	9	75	17			
	108.8	7.5				SILTY SAND, trace GRAVEL: Brown, well graded sand, multi-coloured, fine, rounded to subangular gravel											
	108.3	8.0															
	107.8	8.5															
	107.3	9.0				9.10 m to 9.80 m: Some inferred fragmented cobbles											
	106.8	9.5															
	106.3	10.0		[10.0]							10	8	60	32			

Notes:

BOREHOLE REPORT

BH17-C004

Sheet 3 of 3

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 520,486.0 m

Northing: 7,956,367.0 m

Surface Elevation: 116.30 m

Bottom Elevation: 105.60 m

Total Depth: 10.7 m

Logged By: AB

Reviewed By: CH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 4/14/2017

Driller: Emile and/or Sam

Hole Diameter (mm): 100

Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	105.8	10.5	Sonic Drilling	NO CASING [10.7]		SILTY SAND, trace GRAVEL: Brown, well graded sand, multi-coloured, fine, rounded to subangular gravel *(Continued)*											
	105.3	11.0				To Target Depth. **Drillhole BH17-C004 terminated at 10.7m.**											
	104.8	11.5															
	104.3	12.0															
	103.8	12.5															
	103.3	13.0															
	102.8	13.5															
	102.3	14.0															
	101.8	14.5															
	101.3	15.0															

Notes:

BOREHOLE REPORT

BH17-C005
Sheet 1 of 2

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Easting: 525,227.0 m
Northing: 7,938,527.0 m
Surface Elevation: 185.00 m
Bottom Elevation: 175.90 m
Total Depth: 9.1 m
Logged By: UK
Reviewed By: CH/WH

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 4/14/2017
Driller: Emile and/or Sam
Hole Diameter (mm): 100
Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	184.5	0.5	Sonic Drilling	NO CASING		SILTY SAND: Grey, fine grained, poorly graded	Nf										
	184.0	1.0					Nbn										
	183.5	1.5				ICE and SILTY SAND: Ice rich, grey, poorly graded sand	Vr										
	183.0	2.0															
	182.5	2.5															
	182.0	3.0				SILTY SAND, some GRAVEL: Grey, fine to coarse grained sand; coarse, rounded to subrounded, well graded gravel.	Nf										
	181.5	3.5															
	181.0	4.0															
	180.5	4.5				4.60 m to 6.10 m: Some cobbles, trace boulders	Nbn										
	180.0	5.0		[5.0]													

Notes:

BOREHOLE REPORT

BH17-C005

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 525,227.0 m

Northing: 7,938,527.0 m

Surface Elevation: 185.00 m

Bottom Elevation: 175.90 m

Total Depth: 9.1 m

Logged By: UK

Reviewed By: CH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 4/14/2017

Driller: Emile and/or Sam

Hole Diameter (mm): 100

Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	179.5	5.5	Sonic Drilling	NO CASING		SILTY SAND, some GRAVEL: Grey, fine to coarse grained sand; coarse, rounded to subrounded, well graded gravel. *(Continued)*	Nf *(Continued)*				7	19	57	24			
	179.0	6.0															
	178.5	6.5															
	178.0	7.0															
	177.5	7.5															
	177.0	8.0															
	176.5	8.5				8.50 m to 8.80 m: Some sand	Nbn										
	176.0	9.0															
	175.5	9.5				To Target Depth. **Drillhole BH17-C005 terminated at 9.1m.**											
	175.0	10.0		[10.0]													

Notes:

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BOREHOLE REPORT

BH17-C006

Sheet 1 of 3

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 527,315.0 m

Northing: 7,932,504.0 m

Surface Elevation: 178.60 m

Bottom Elevation: 167.90 m

Total Depth: 10.7 m

Logged By: AB

Reviewed By: CH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 4/15/2017

Driller: Emile and/or Sam

Hole Diameter (mm): 100

Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	178.1	0.5	Sonic Drilling	NO CASING		SILTY SAND, inferred BOULDERS: Grey, fine grained, poorly graded sand; grey boulder fragments											
	177.6	1.0															
	177.1	1.5															
	176.6	2.0															
	176.1	2.5															
	175.6	3.0				SAND and SILT, some GRAVEL, ICE Inclusions: Brown sand; multi-coloured, fine, rounded gravel	Vr Vc				14	19	43	38			
	175.1	3.5															
	174.6	4.0															
	174.1	4.5															
	173.6	5.0		[5.0]													

Notes:

BOREHOLE REPORT

BH17-C006

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 527,315.0 m
Northing: 7,932,504.0 m
Surface Elevation: 178.60 m
Bottom Elevation: 167.90 m
Total Depth: 10.7 m
Logged By: AB
Reviewed By: CH/WH

Contractor: Boart Longyear
Driller: Emile and/or Sam
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 100
Date Logged: 4/15/2017
Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	173.1	5.5	Sonic Drilling	NO CASING		SAND and SILT, some GRAVEL, ICE Inclusions: Brown sand; multi-coloured, fine, rounded gravel *(Continued)*	Vr *(Continued)*										
	172.6	6.0					Nbe										
	172.1	6.5															
	171.6	7.0				SILT and SAND, inferred BOULDERS: Light brown silt; fine grained, well graded sand; grey boulder fragments											
	171.1	7.5															
	170.6	8.0				GRAVELLY SAND and SILT, ICE Inclusions: Light brown silt; angular gravel; possible boulders	Vx			●	16	22	42	27			
	170.1	8.5															
	169.6	9.0					Vr										
	169.1	9.5															
	168.6	10.0		[10.0]													

Notes:

BOREHOLE REPORT

BH17-C006

Sheet 3 of 3

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 527,315.0 m

Northing: 7,932,504.0 m

Surface Elevation: 178.60 m

Bottom Elevation: 167.90 m

Total Depth: 10.7 m

Logged By: AB

Reviewed By: CH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 4/15/2017

Driller: Emile and/or Sam

Hole Diameter (mm): 100

Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 50 – 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	168.1	10.5	Sonic Drilling	NO CASING [10.7]		GRAVELLY SAND and SILT, ICE Inclusions: Light brown silt; angular gravel; possible boulders *(Continued)* 10.40 m to 10.70 m: Inferred Boulders	Vx *(Continued)* Vr										
	167.6	11.0				To Target Depth. **Drillhole BH17-C006 terminated at 10.7m.**											
	167.1	11.5															
	166.6	12.0															
	166.1	12.5															
	165.6	13.0															
	165.1	13.5															
	164.6	14.0															
	164.1	14.5															
	163.6	15.0															

Notes:

BOREHOLE REPORT

BH17-C006B

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 528,253.0 m

Northing: 7,929,081.0 m

Surface Elevation: 0.00 m

Bottom Elevation: -6.10 m

Total Depth: 6.1 m

Logged By: UK

Reviewed By: CH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 4/17/2017

Driller: Emile and/or Sam

Hole Diameter (mm): 100

Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	-0.5	0.5	Sonic Drilling	NO CASING		SILTY SAND, some COBBLES: Brown, fine grained sand; rounded to sub-rounded cobbles	Nf										
	-1.0	1.0				SILTY SAND: Reddish brown, fine to medium grained sand	Nf										
	-1.5	1.5															
	-2.0	2.0					Nbn										
	-2.5	2.5															
	-3.0	3.0															
	-3.5	3.5					Nbn										
	-4.0	4.0															
	-4.5	4.5															
	-5.0	5.0		[5.0]													

Notes:

BOREHOLE REPORT

BH17-C006B

Sheet 2 of 2

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 528,253.0 m

Northing: 7,929,081.0 m

Surface Elevation: 0.00 m

Bottom Elevation: -6.10 m

Total Depth: 6.1 m

Logged By: UK

Reviewed By: CH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 4/17/2017

Driller: Emile and/or Sam

Hole Diameter (mm): 100

Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	-5.5	5.5	Sonic Drilling	NO CASING		SILTY SAND: Reddish brown, fine to medium grained sand *(Continued)*	Nf *(Continued)*										
	-6.0	6.0		[6.1]													
						To Target Depth. **Drillhole BH17-C006B terminated at 6.1m.**											
	-6.5	6.5															
	-7.0	7.0															
	-7.5	7.5															
	-8.0	8.0															
	-8.5	8.5															
	-9.0	9.0															
	-9.5	9.5															
	-10.0	10.0															

Notes:

HATCH BOREHOLE REPORT

BH17-C007

Sheet 1 of 1

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Easting: 528,564.0 m
Northing: 7,917,138.0 m
Surface Elevation: 132.00 m
Bottom Elevation: 127.40 m
Total Depth: 4.6 m
Logged By: AB
Reviewed By: CH/WH

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 4/22/2017
Driller: Emile and/or Sam
Hole Diameter (mm): 100
Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	131.5	0.5	Sonic Drilling	NO CASING		ORGANIC SILT, some SAND: Brown sand, dark grey organics, some rootlets											
	131.0	1.0															
	130.5	1.5				SILT and SAND, trace GRAVEL: Light brown, fine to coarse grained, well graded sand	Nbe										
	130.0	2.0															
	129.5	2.5					Vc										
							Vr										
	129.0	3.0															
	128.5	3.5															
	128.0	4.0				3.70 m to 4.60 m: Grey, fine grained	Vs				14	10	37	53			
	127.5	4.5		[4.6]													
	127.0	5.0				To Target Depth. **Drillhole BH17-C007 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH17-C010

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 529,961.0 m

Northing: 7,916,702.0 m

Surface Elevation: 0.00 m

Bottom Elevation: -4.60 m

Total Depth: 4.6 m

Logged By: AB

Reviewed By: CH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 4/20/2017

Driller: Emile and/or Sam

Hole Diameter (mm): 100

Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	-0.5	0.5	Sonic Drilling	NO CASING		SAND, trace SILT, trace GRAVEL: Brown, very dense, fine to coarse grained sand, well graded	Nf										
	-1.0	1.0															
	-1.5	1.5															
	-2.0	2.0					Nbe										
	-2.5	2.5									14	1	88	11			
	-3.0	3.0					Nf										
	-3.5	3.5															
	-4.0	4.0									15	0	90	9			
	-4.5	4.5		[4.6]													
	-5.0	5.0				To Target Depth. **Drillhole BH17-C010 terminated at 4.6m.**											

Notes:

HATCH BOREHOLE REPORT

BH17-C011

Sheet 1 of 1

Client: Baffinland Iron Mines
Project No.: H352034
Project: Mary River Expansion Study Stage 2
Datum: NAD83
Location: Proposed Rail Alignment
Platform: Ground

Easting: 532,072.0 m
Northing: 7,917,478.0 m
Surface Elevation: 168.00 m
Bottom Elevation: 163.40 m
Total Depth: 4.6 m
Logged By: UK
Reviewed By: CH/WH

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 4/19/2017
Driller: Emile and/or Sam
Hole Diameter (mm): 100
Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	168.0	0.0	Sonic Drilling	NO CASING		SILTY SAND: Dark brown, organic	Nf										
	167.5	0.5				SILTY SAND, trace COBBLES: Brown, fine grained sand, rounded to subrounded cobbles	Nf										
	167.0	1.0															
	166.5	1.5				1.50 m to 3.0 m: No cobbles encountered	Vs										
							Vr										
	166.0	2.0															
	165.5	2.5															
	165.0	3.0															
	164.5	3.5					Nbn										
	164.0	4.0									17	0	76	24			
	163.5	4.5		[4.6]													
	163.0	5.0				To Target Depth. **Drillhole BH17-C011 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH17-C012

Sheet 1 of 1

Client: Baffinland Iron Mines

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Easting: 533,228.0 m

Northing: 7,918,553.0 m

Surface Elevation: 182.66 m

Bottom Elevation: 178.06 m

Total Depth: 4.6 m

Logged By: UK

Reviewed By: CH/WH

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 4/19/2017

Driller: Emile and/or Sam

Hole Diameter (mm): 100

Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	182.2	0.5	Sonic Drilling	NO CASING		SILTY SAND: Dark grey, fine grained sand	Nf										
	181.7	1.0															
	181.2	1.5					Vx										
	180.7	2.0															
	180.2	2.5				ICE: White, cloudy texture	ICE										
	179.7	3.0				GRAVELLY SILT and SAND: Brown, fine grained sand; coarse, angular to sub-angular gravel	Nf										
	179.2	3.5															
	178.7	4.0								●	8	25	35	40			
	178.2	4.5		[4.6]													
	177.7	5.0				To Target Depth. **Drillhole BH17-C012 terminated at 4.6m.**											

Notes:

HATCH BOREHOLE REPORT

BH17-C013

Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Proposed Rail Alignment

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 534,196.0 m
Northing: 7,918,569.0 m
Surface Elevation: 182.20 m
Bottom Elevation: 177.60 m
Total Depth: 4.6 m
Logged By: UK
Reviewed By: CH/WH

Contractor: Boart Longyear
Driller: Emile and/or Sam
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 100
Date Logged: 4/18/2016
Date Reviewed: 6/8/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	181.7	0.5	Sonic Drilling	NO CASING		SAND and SILT, some GRAVEL: Brown, fine grained sand; coarse, sub-rounded to rounded gravel	Nf										
	181.2	1.0									14	12	43	46			
	180.7	1.5				ICE and SILTY SAND: Grey, fine grained sand, stratified to irregular oriented ice formation	ICE + SOIL										
	180.2	2.0															
	179.7	2.5															
	179.2	3.0															
	178.7	3.5															
	178.2	4.0															
	177.7	4.5		[4.6]													
	177.2	5.0				To Target Depth. **Drillhole BH17-C013 terminated at 4.6m.**											

Notes:

BOREHOLE REPORT

BH17-BR86-1
Sheet 1 of 4

Client: Baffinland Iron Mines Corporation
Project: Mary River Expansion Project
Location: North West Abutment

Project No.: H353004
Datum: NAD83
Platform: Ground

Easting: 542,257.3 m
Northing: 7,922,181.7 m
Surface Elevation: 142.93 m
Bottom Elevation: 103.33 m
Total Depth: 39.6 m
Logged By: R.S
Reviewed By: H.G

Contractor: Boart Longyear
Driller: Brent McAndrew
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 100 mm
Date Logged: 10/1/2017
Date Reviewed: 2/10/2018

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 25 – 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	142.9	0.0				Sandy GRAVEL, trace Silt: Brown.	unfrozen										
	141.9	1.0				SAND, trace Silt: Brown to greyish-brown, medium to fine grained, well graded. Ice poor soil.	Nbn										
	140.9	2.0															
	139.9	3.0															
	138.9	4.0															
	137.9	5.0				ICE	ICE										
	136.9	6.0				SAND, trace Silt: Alternating layers of grey sand and brown silty sand, poorly graded, medium to fine grained. Ice poor soil.	Nbn										
	135.9	7.0															
	134.9	8.0															
	133.9	9.0															
	132.9	10.0															
	131.9	11.0															

Notes: Hole not located directly on abutment.

HATCH BOREHOLE REPORT

BH17-BR86-1

Sheet 2 of 4

Client: Baffinland Iron Mines Corporation

Project: Mary River Expansion Project

Location: North West Abutment

Project No.: H353004

Datum: NAD83

Platform: Ground

Easting: 542,257.3 m

Northing: 7,922,181.7 m

Surface Elevation: 142.93 m

Bottom Elevation: 103.33 m

Total Depth: 39.6 m

Logged By: R.S

Reviewed By: H.G

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/1/2017

Driller: Brent McAndrew

Hole Diameter (mm): 100 mm

Date Reviewed: 2/10/2018

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 25 50	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	130.9	12.0				SAND, trace Silt: Alternating layers of grey sand and brown silty sand, poorly graded, medium to fine grained. Ice poor soil. *(Continued)*	Nbn *(Continued)*										
	129.9	13.0															
	128.9	14.0															
	127.9	15.0															
	126.9	16.0															
	125.9	17.0															
	124.9	18.0															
	123.9	19.0															
	122.9	20.0															
	121.9	21.0															
	120.9	22.0															

Notes: Hole not located directly on abutment.

BOREHOLE REPORT

BH17-BR86-1
Sheet 3 of 4

Client: Baffinland Iron Mines Corporation
Project No.: H353004
Project: Mary River Expansion Project
Datum: NAD83
Location: North West Abutment
Platform: Ground

Easting: 542,257.3 m
Northing: 7,922,181.7 m
Surface Elevation: 142.93 m
Bottom Elevation: 103.33 m
Total Depth: 39.6 m
Logged By: R.S
Reviewed By: H.G

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 10/1/2017
Driller: Brent McAndrew
Hole Diameter (mm): 100 mm
Date Reviewed: 2/10/2018

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 25 50	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	119.9	23.0				SAND, trace Silt: Alternating layers of grey sand and brown silty sand, poorly graded, medium to fine grained. Ice poor soil. *(Continued)*	Nbn *(Continued)*										
	118.9	24.0															
	117.9	25.0															
	116.9	26.0															
	115.9	27.0															
	114.9	28.0															
	113.9	29.0				29.30m to 29.4m: Some fine gravel.											
	112.9	30.0															
	111.9	31.0															
	110.9	32.0															
	109.9	33.0															

Notes: Hole not located directly on abutment.

BOREHOLE REPORT

BH17-BR86-1
Sheet 4 of 4

Client: Baffinland Iron Mines Corporation
Project No.: H353004
Project: Mary River Expansion Project
Datum: NAD83
Location: North West Abutment
Platform: Ground

Easting: 542,257.3 m
Northing: 7,922,181.7 m
Surface Elevation: 142.93 m
Bottom Elevation: 103.33 m
Total Depth: 39.6 m
Logged By: R.S
Reviewed By: H.G

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 10/1/2017
Driller: Brent McAndrew
Hole Diameter (mm): 100 mm
Date Reviewed: 2/10/2018

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 25 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	108.9	34.0				SAND, trace Silt: Alternating layers of grey sand and brown silty sand, poorly graded, medium to fine grained. Ice poor soil. *(Continued)*	Nbn *(Continued)*										
	107.9	35.0				SAND, with SILT: Brown, fine grained. Ice poor soil.	Nbn										
	106.9	36.0															
	105.9	37.0				35.0m to 37.8m: Dark brownish-grey.											
	104.9	38.0															
	103.9	39.0															
	102.9	40.0				To Target Depth. **Drillhole BH17-BR86-1 terminated at 39.6m.**											
	101.9	41.0															
	100.9	42.0															
	99.9	43.0															
	98.9	44.0															

Notes: Hole not located directly on abutment.

BOREHOLE REPORT

BH17-BR86-2

Sheet 1 of 4

Client: Baffinland Iron Mines Corporation

Project: Mary River Expansion Project

Location: North West Abutment

Project No.: H353004

Datum: NAD83

Platform: Ground

Easting: 542,268.6 m

Northing: 7,922,171.3 m

Surface Elevation: 142.97 m

Bottom Elevation: 103.37 m

Total Depth: 39.6 m

Logged By: U.K and R.S

Reviewed By: H.G

Contractor: Boart Longyear

Driller: Brent McAndrew

Rig Type/ Mounting: MiniSonic Rig

Hole Diameter (mm): 100 mm

Date Logged: 10/26/2017

Date Reviewed: 2/10/2018

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 25 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	142.0	1.0				Sandy GRAVEL, trace SILT: Brown.	unfrozen										
	142.0	1.0				SAND, trace SILT: Brown and greysish-brown. Ice poor soil.	Nbn				14	25	72	2			
	141.0	2.0									23	0	93	7			
	140.0	3.0									18	0	91	9			
	139.0	4.0															
	138.0	5.0				4.6m to 6.1m: Uniform brown colour, trace multi-coloured fine gravel.					37	4	91	5			
	137.0	6.0															
	136.0	7.0															
	135.0	8.0				SAND, trace to some Silt: Alternating layers of grey sand and brown silty-sand, poorly graded. Ice poor soil.	Nbn										
	134.0	9.0															
	133.0	10.0									22	0	89	11			
	132.0	11.0															

Notes: Hole is directly on North West Abutment.

BOREHOLE REPORT

BH17-BR86-2
Sheet 2 of 4

Client: Baffinland Iron Mines Corporation
Project: Mary River Expansion Project
Location: North West Abutment

Project No.: H353004
Datum: NAD83
Platform: Ground

Easting: 542,268.6 m
Northing: 7,922,171.3 m
Surface Elevation: 142.97 m
Bottom Elevation: 103.37 m
Total Depth: 39.6 m
Logged By: U.K and R.S
Reviewed By: H.G

Contractor: Boart Longyear
Driller: Brent McAndrew
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 100 mm
Date Logged: 10/26/2017
Date Reviewed: 2/10/2018

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 25 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	131.0	12.0				SAND, trace to some Silt: Alternating layers of grey sand and brown silty-sand, poorly graded. Ice poor soil. *(Continued)*	Nbn *(Continued)*				23						
	130.0	13.0															
	129.0	14.0															
	128.0	15.0															
	127.0	16.0															
	126.0	17.0															
	125.0	18.0															
	124.0	19.0															
	123.0	20.0									22	0	90	10			
	122.0	21.0															
	121.0	22.0															

Notes: Hole is directly on North West Abutment.

BOREHOLE REPORT

BH17-BR86-2

Sheet 3 of 4

Client: Baffinland Iron Mines Corporation

Project: Mary River Expansion Project

Location: North West Abutment

Project No.: H353004

Datum: NAD83

Platform: Ground

Easting: 542,268.6 m

Northing: 7,922,171.3 m

Surface Elevation: 142.97 m

Bottom Elevation: 103.37 m

Total Depth: 39.6 m

Logged By: U.K and R.S

Reviewed By: H.G

Contractor: Boart Longyear

Driller: Brent McAndrew

Rig Type/ Mounting: MiniSonic Rig

Hole Diameter (mm): 100 mm

Date Logged: 10/26/2017

Date Reviewed: 2/10/2018

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 25 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	120.0	23.0				SAND, trace to some Silt: Alternating layers of grey sand and brown silty-sand, poorly graded. Ice poor soil. *(Continued)*	Nbn *(Continued)*										
	119.0	24.0									25						
	118.0	25.0															
	117.0	26.0															
	116.0	27.0															
	115.0	28.0															
	114.0	29.0															
	113.0	30.0									26						
	112.0	31.0															
	111.0	32.0															
	110.0	33.0															

Notes: Hole is directly on North West Abutment.

BOREHOLE REPORT

BH17-BR86-2
Sheet 4 of 4

Client: Baffinland Iron Mines Corporation
Project: Mary River Expansion Project
Location: North West Abutment

Project No.: H353004
Datum: NAD83
Platform: Ground

Easting: 542,268.6 m
Northing: 7,922,171.3 m
Surface Elevation: 142.97 m
Bottom Elevation: 103.37 m
Total Depth: 39.6 m
Logged By: U.K and R.S
Reviewed By: H.G

Contractor: Boart Longyear
Driller: Brent McAndrew
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 100 mm
Date Logged: 10/26/2017
Date Reviewed: 2/10/2018

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 / 25 / 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	109.0	34.0				SAND, trace to some Silt: Alternating layers of grey sand and brown silty-sand, poorly graded. Ice poor soil. *(Continued)*	Nbn *(Continued)*										
	108.0	35.0															
	107.0	36.0															
	106.0	37.0									27						
	105.0	38.0				37.4m to 39.3m: Trace Organics, dark brownish-grey to black, thin lenses of organics.											
	104.0	39.0															
						SAND, and SILT: Brown, fine grained. Ice poor soil.	Nbn				25	0	61	39			
	103.0	40.0				To Target Depth. **Drillhole BH17-BR86-2 terminated at 39.6m.**											
	102.0	41.0															
	101.0	42.0															
	100.0	43.0															
	99.0	44.0															

Notes: Hole is directly on North West Abutment.

BOREHOLE REPORT

BH17-BR86-3
Sheet 1 of 4

Client: Baffinland Iron Mines Corporation
Project No.: H353004
Project: Mary River Expansion Project
Datum: NAD83
Location: South East Abutment
Platform: Ground

Easting: 542,304.8 m
Northing: 7,922,141.4 m
Surface Elevation: 143.38 m
Bottom Elevation: 103.78 m
Total Depth: 39.6 m
Logged By: U.K
Reviewed By: H.G

Contractor: Boart Longyear
Rig Type/ Mounting: MiniSonic Rig
Date Logged: 10/22/2017
Driller: Brent McAndrew
Hole Diameter (mm): 100 mm
Date Reviewed: 2/10/2018

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 25 – 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	142.4	1.0				SAND with Gravel, trace Silt: Brown.	unfrozen				14	21	69	10			
	141.4	2.0				SAND, trace to some SILT: Brown and greyish- brown, medium to fine grained. Ice poor soil.	Nbn				23	0	93	7			
	140.4	3.0									24	0	94	6			
	139.4	4.0															
	138.4	5.0									25	0	89	11			
	137.4	6.0				6.1m to 9.0m: Colour changes to uniform dark brown.											
	136.4	7.0															
	135.4	8.0									26	0	78	22			
	134.4	9.0															
	133.4	10.0				SAND, trace Silt: Alternating layers of grey sand and brown silty sand, poorly graded, medium to fine. Ice poor soil.	Nbn										
	132.4	11.0															

Notes: Hole is directly on South East Abutment

BOREHOLE REPORT

BH17-BR86-3
Sheet 2 of 4

Client: Baffinland Iron Mines Corporation
Project: Mary River Expansion Project
Location: South East Abutment

Project No.: H353004
Datum: NAD83
Platform: Ground

Easting: 542,304.8 m
Northing: 7,922,141.4 m
Surface Elevation: 143.38 m
Bottom Elevation: 103.78 m
Total Depth: 39.6 m
Logged By: U.K
Reviewed By: H.G

Contractor: Boart Longyear
Driller: Brent McAndrew
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 100 mm
Date Logged: 10/22/2017
Date Reviewed: 2/10/2018

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 25 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	131.4	12.0				SAND, trace Silt: Alternating layers of grey sand and brown silty sand, poorly graded, medium to fine. Ice poor soil. *(Continued)*	Nbn *(Continued)*				26	0	93	7			
	130.4	13.0															
	129.4	14.0															
	128.4	15.0															
	127.4	16.0				15.2m to 16.8m: Silty sand layers are dark brown.											
	126.4	17.0															
	125.4	18.0															
	124.4	19.0															
	123.4	20.0															
	122.4	21.0															
	121.4	22.0															

Notes: Hole is directly on South East Abutment

BOREHOLE REPORT

BH17-BR86-3

Sheet 3 of 4

Client: Baffinland Iron Mines Corporation

Project: Mary River Expansion Project

Location: South East Abutment

Project No.: H353004

Datum: NAD83

Platform: Ground

Easting: 542,304.8 m

Northing: 7,922,141.4 m

Surface Elevation: 143.38 m

Bottom Elevation: 103.78 m

Total Depth: 39.6 m

Logged By: U.K

Reviewed By: H.G

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/22/2017

Driller: Brent McAndrew

Hole Diameter (mm): 100 mm

Date Reviewed: 2/10/2018

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 / 25 / 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	120.4	23.0				SAND, trace Silt: Alternating layers of grey sand and brown silty sand, poorly graded, medium to fine. Ice poor soil. *(Continued)*	Nbn *(Continued)*										
	119.4	24.0				23.0m to 24.5m: Colour changes to dark brown, layers are now brown and dark brown.											
	118.4	25.0															
	117.4	26.0															
	116.4	27.0				27.4m to 30.5m: Colour changes to grey, layers are now light and dark grey.											
	115.4	28.0															
	114.4	29.0															
	113.4	30.0									25	0	92	8			
	112.4	31.0				SAND, trace SILT: Brown to grey. Ice poor soil.	Nbn										
	111.4	32.0															
	110.4	33.0															

Notes: Hole is directly on South East Abutment

BOREHOLE REPORT

BH17-BR86-3

Sheet 4 of 4

Client: Baffinland Iron Mines Corporation

Project: Mary River Expansion Project

Location: South East Abutment

Project No.: H353004

Datum: NAD83

Platform: Ground

Easting: 542,304.8 m

Northing: 7,922,141.4 m

Surface Elevation: 143.38 m

Bottom Elevation: 103.78 m

Total Depth: 39.6 m

Logged By: U.K

Reviewed By: H.G

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/22/2017

Driller: Brent McAndrew

Hole Diameter (mm): 100 mm

Date Reviewed: 2/10/2018

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 25 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	109.4	34.0				SAND, trace SILT: Brown to grey. Ice poor soil. *(Continued)*	Nbn *(Continued)*										
	108.4	35.0															
	107.4	36.0															
	106.4	37.0															
	105.4	38.0															
	104.4	39.0															
	103.4	40.0				To Target Depth. **Drillhole BH17-BR86-3 terminated at 39.6m.**											
	102.4	41.0															
	101.4	42.0															
	100.4	43.0															
	99.4	44.0															

Notes: Hole is directly on South East Abutment

BOREHOLE REPORT

BH18-102-1

Sheet 1 of 2

Client: Baffinland Iron Mine

Project: Mary River Expansion Study

Location: Proposed Bridge 102 Abutment

Project No.: H353004

Datum: NAD83

Platform:

Easting: 555,763.0 m

Northing: 7,915,435.0 m

Surface Elevation: 168.00 m

Bottom Elevation: 158.35 m

Total Depth: 9.7 m

Logged By: YF/MY

Reviewed By:

Contractor: Boart Longyear

Rig Type/ Mounting: Sonic Drill Rig

Date Logged: 4/7/2018

Driller: Brent McAndrew

Hole Diameter (mm): 100

Date Reviewed:

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 25 50	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	168.0	0.0				PEAT: Frozen with roots.	Nf										
						GRAVEL: Two boulders.											
	167.0	1.0				GRAVELLY SAND with COBBLES: Brown.											
						Start of Coring at 1.3m. ***Continued on Rock Core Log sheet.***											
	166.0	2.0															
	165.0	3.0															
	164.0	4.0															
	163.0	5.0															
	162.0	6.0															
	161.0	7.0															
	160.0	8.0															
	159.0	9.0															
	158.0	10.0															

Notes:

BOREHOLE LOG

ROCK CORE FORMAT

BH18-102-1

Sheet 2 of 3

Client: Baffinland Iron Mine

Project: Mary River Expansion Study

Location: Proposed Bridge 102 Abutment

Project No.: H353004

Datum: NAD83

Platform:

Easting: 555,763.0 m

Northing: 7,915,435.0 m

Surface Elevation: 168.00 m

Bottom Elevation: 158.35 m

Total Depth: 9.7 m

Logged By: YF/MY

Reviewed By:

Contractor: Boart Longyear **Rig Type/ Mounting:** Sonic Drill Rig **Bearing:** N/A° **Date Logged:** 4/7/2018

Driller: Brent McAndrew **Hole Diameter (mm):** 100 **Plunge:** ° **Date Checked:**

Water	Elevation (m)	Depth (m)	Method	Run #/TCR	Graphic Log	Geological Unit	Rock Description: ROCK TYPE; Grain size, texture and fabric, colour, general defect conditions, minor constituents.	Weathering/ Cementation	Estimated Strength (EH VH H M L VL EL)	$Is_{(50)}$ [UCS] MPa	Defect Spacing mm (2000 600 200 [100] 60 20)	RQD %	Defect Log	Defect Description: Inclination, type, infill, amount, aperture, planarity, roughness, frequency (Specific / General)
	167.0	1.0					***Resuming in Rock Core Format 1.3m.***							
	166.0	2.0					BEDROCK: Gneiss, red plagioclase feldspar, coarse to very coarse grained, strong to very strong rock, fresh. 1.73 m: One discontinuity angled approx. 30 deg, black coated, 8 mm black alteration zone. 2.09 m - 2.31 m: Fractured area. 2.31 m - 2.91 m: Becoming coarser grained. 3.00 m: Becoming grey with pink (7 mm) veins, medium grained, strong to very strong. 3.53 m - 3.74 m: Black biotite mica, fractured zone, irregularly oriented 0.5 mm - 5 mm crystals. 3.74 m - 4.54 m: Quartzo feldspathic gneiss, grey to pink, very strong to strong. 4.54 m - 4.85 m: Potassium feldspar rich, pink, fractured zone. 4.85 m - 4.96 m: Possibly chloritized, 2 mm vein, medium grained, medium strong. 4.91 m - 4.93 m: Clay vein, weak. 4.96 m - 5.06 m: Some gneissic banding, red/black fine grained, strong. 5.06 m - 5.26 m: Broken core, clay rich vein, fine to medium grained, red/black, chlorite infilled joints. 5.26 m - 6.01 m: Trace potassium feldspar banding, quartz rich, strong grey, fine. 6.06 m - 6.36 m: Quartzo feldspar with black biotite banding, potassium feldspar rich, red, chlorite infilled joints. 6.36 m - 6.59 m: Quartz and feldspar, grey. 8.12 m - 8.26 m: Gneiss, grey pink, strong. 8.26 m - 8.30 m: Possible clay zone,							
	165.0	3.0												
	164.0	4.0												
	163.0	5.0												
	162.0	6.0												
	161.0	7.0												
	160.0	8.0												
	159.0	9.0												
	158.0	10.0												

Notes:

Defect Description Legend

Planarity		Type				Roughness		Infill Amount	
Pl	Planar	Dl	Drilling Induced	Sm	Seam	Ro	Rough	cn	Clean
Ir	Irregular	Jt	Joint	Cz	Crushed Zone	Sm	Smooth	sn	Stained
Cu	Curved	Pt	Parting on Contact	Fz	Fractured Zone	Po	Polished	vn	Veneer
Un	Undulose	Sh	Shear Seam	Band	Weak Band	Sl	Slickenside	cg	Coating
St	Stepped	Cs	Crushed Seam						

BOREHOLE LOG

ROCK CORE FORMAT

BH18-102-1

Sheet 3 of 3

Client: Baffinland Iron Mine

Project: Mary River Expansion Study

Location: Proposed Bridge 102 Abutment

Project No.: H353004

Datum: NAD83

Platform:

Easting: 555,763.0 m

Northing: 7,915,435.0 m

Surface Elevation: 168.00 m

Bottom Elevation: 158.35 m

Total Depth: 9.7 m

Logged By: YF/MY

Reviewed By:

Contractor: Boart Longyear **Rig Type/ Mounting:** Sonic Drill Rig **Bearing:** N/A° **Date Logged:** 4/7/2018

Driller: Brent McAndrew **Hole Diameter (mm):** 100 **Plunge:** ° **Date Checked:**

Water	Elevation (m)	Depth (m)	Method	Run #/TCR	Graphic Log	Geological Unit	Rock Description ROCK TYPE; Grain size, texture and fabric, colour, general defect conditions, minor constituents.	Weathering/ Cementation	Estimated Strength EH VH H M L VL EL	$Is_{(50)}$ [UCS] MPa	Defect Spacing mm 2000 600 200 [100] 60 20	RQD %	Defect Log	Defect Description Inclination, type, infill, amount, aperture, planarity, roughness, frequency Specific / General
	157.0	11.0					possibly chloritized, weak. 8.30 m - 8.61 m: Fine to medium grained, grey. 8.61 m - 8.87 m: Band of quartz to potasium feldspar, coarse grained, pink. Remainder fine to medium grained, grey, possible possible chlorite veins, trace pyrite, black biotite veins.							
	156.0	12.0					To Target Depth. **Drillhole BH18-102-1 terminated at 9.7m.**							
	155.0	13.0												
	154.0	14.0												
	153.0	15.0												
	152.0	16.0												
	151.0	17.0												
	150.0	18.0												
	149.0	19.0												
	148.0	20.0												

Notes:

Defect Description Legend

Planarity		Type				Roughness		Infill Amount	
Pl	Planar	Dl	Drilling Induced	Sm	Seam	Ro	Rough	cn	Clean
Ir	Irregular	Jt	Joint	Cz	Crushed Zone	Sm	Smooth	sn	Stained
Cu	Curved	Pt	Parting on Contact	Fz	Fractured Zone	Po	Polished	vn	Veneer
Un	Undulose	Sh	Shear Seam	Band	Weak Band	Sl	Slickenside	cg	Coating
St	Stepped	Cs	Crushed Seam						

BOREHOLE REPORT

BH18-102-2
Sheet 1 of 3

Client: Baffinland Iron Mine
Project: Mary River Expansion Study
Location: Proposed Bridge 102 Abutment

Project No.: H353004
Datum: NAD83
Platform:

Easting: 555,674.0 m
Northing: 7,915,409.0 m
Surface Elevation: 166.00 m
Bottom Elevation: 149.10 m
Total Depth: 16.9 m
Logged By: YF/MY
Reviewed By:

Contractor: Boart Longyear
Driller: Brent McAndrew
Rig Type/ Mounting: Sonic Drill Rig
Hole Diameter (mm): 100
Date Logged: 4/8/2018
Date Reviewed:

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 25 – 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	165.0	1.0				SAND and GRAVEL: Medium grained sand, brown, slightly moist.	Nf inferred										
						GRAVELLY SAND, trace BOULDERS: Fine sand, possible boulder dust.	Nf inferred										
	164.0	2.0				GRAVELLY SAND, trace SILT: Medium to coarse grained, brownish grey to brown, subrounded to subangular.	Nf inferred										
	163.0	3.0				3.40 m and 3.70 m: Cobbles						31	69	0			
	162.0	4.0				SAND, some GRAVEL, trace SILT: Medium to fine grained, brownish grey.	Nf inferred										
	161.0	5.0				4.70 m: Inferred boulder. 5.00 m and 5.30 m: Cobble.											
	160.0	6.0				GRAVEL to COBBLES: Mixed igneous / metamorphic, washed. 5.6m: Organic / sulfur layer.											
	159.0	7.0															
	158.0	8.0															
	157.0	9.0				***Start of Coring at 8.7m.*** ***Continued on Rock Core Log sheet.***											
	156.0	10.0															

Notes:

BOREHOLE LOG

ROCK CORE FORMAT

BH18-102-2

Client: Baffinland Iron Mine

Project: Mary River Expansion Study

Location: Proposed Bridge 102 Abutment

Project No.: H353004

Datum: NAD83

Platform:

Easting: 555,674.0 m

Northing: 7,915,409.0 m

Surface Elevation: 166.00 m

Bottom Elevation: 149.10 m

Total Depth: 16.9 m

Logged By: YF/MY

Reviewed By:

Contractor: Boart Longyear **Rig Type/ Mounting:** Sonic Drill Rig **Bearing:** N/A° **Date Logged:** 4/8/2018

Driller: Brent McAndrew **Hole Diameter (mm):** 100 **Plunge:** ° **Date Checked:**

Water	Elevation (m)	Depth (m)	Method	Run #/TCR	Graphic Log	Geological Unit	Rock Description: ROCK TYPE; Grain size, texture and fabric, colour, general defect conditions, minor constituents.	Weathering/ Cementation	Estimated Strength (EH VH H M L VL EL)	$Is_{(50)}$ [UCS] MPa	Defect Spacing mm (2000 600 200 [100] 60 20)	RQD %	Defect Log	Defect Description: Inclination, type, infill, amount, aperture, planarity, roughness, frequency (Specific / General)
	165.0	1.0												
	164.0	2.0												
	163.0	3.0												
	162.0	4.0												
	161.0	5.0												
	160.0	6.0												
	159.0	7.0												
	158.0	8.0					***Resuming in Rock Core Format 8.7m.***							
	157.0	9.0		9 / 135			BEDROCK: Gneiss, visible medium to coarse grains, red, black, and grey, strong to very strong.					77		Fz DI DI 10° Jt Pl Sm 20° Jt Pl Sm Red stains sn
	156.0	10.0										22		Fz

Notes:

Defect Description Legend

Planarity		Type				Roughness		Infill Amount	
Pl	Planar	Dl	Drilling Induced	Sm	Seam	Ro	Rough	cn	Clean
Ir	Irregular	Jt	Joint	Cz	Crushed Zone	Sm	Smooth	sn	Stained
Cu	Curved	Pt	Parting on Contact	Fz	Fractured Zone	Po	Polished	vn	Veneer
Un	Undulose	Sh	Shear Seam	Band	Weak Band	Sl	Slickenside	cg	Coating
St	Stepped	Cs	Crushed Seam						

BOREHOLE LOG

ROCK CORE FORMAT

BH18-102-2

Sheet 3 of 3

Client: Baffinland Iron Mine

Project: Mary River Expansion Study

Location: Proposed Bridge 102 Abutment

Project No.: H353004

Datum: NAD83

Platform:

Easting: 555,674.0 m

Northing: 7,915,409.0 m

Surface Elevation: 166.00 m

Bottom Elevation: 149.10 m

Total Depth: 16.9 m

Logged By: YF/MY

Reviewed By:

Contractor: Boart Longyear **Rig Type/ Mounting:** Sonic Drill Rig **Bearing:** N/A° **Date Logged:** 4/8/2018

Driller: Brent McAndrew **Hole Diameter (mm):** 100 **Plunge:** ° **Date Checked:**

Water	Elevation (m)	Depth (m)	Method	Run #/TCR	Graphic Log	Geological Unit	Rock Description (ROCK TYPE; Grain size, texture and fabric, colour, general defect conditions, minor constituents.)	Weathering/ Cementation	Estimated Strength (EH VH H M L VL EL)	$Is_{(50)}$ [UCS] MPa	Defect Spacing mm (2000 600 200 [100] 60 20)	RQD %	Defect Log	Defect Description (Inclination, type, infill, amount, aperture, planarity, roughness, frequency) Specific / General
	155.0	11.0		10 / 98			BEDROCK: Gneiss, visible medium to coarse grains, red, black, and grey, strong to very strong. *(Continued)*					22		
				11 / 76			10.90 m: Possible porphyriticm, no gneissic banding.					43		Cz 90° Jt Pl Sm 40° Jt Cu Sm 70° Jt Pl Sm Orange stains sn Dl 75° Jt Pl Sm Fz
	154.0	12.0		12 / 115								87		45° Jt Pl Sm Rust staining sn Fz
	153.0	13.0		13 / 115			12.50 m: Two weathered / soft zones / seams at 13.00 m and 13.30 m, 4 mm, one visible joint, non stained.					66		Dl 30° Jt Pl Sm sn 80° Jt Pl Ro cg 50° Jt Pl Sm cg Fz
	152.0	14.0		14 / 91			13.70 m: Minor gneissic banding, becoming iron stained, black, weak.					49		20° Jt Pl Sm 75° Jt Cu Ro Rust stain, silt infill sn Dl 70° Jt Cu Sm Rusty infill sn Fz 80° Jt Pl Sm Rust infill sn Dl 5° Jt Pl Ro Black silty infill cg 75° Jt 80° Jt Pl Sm infill cg 90° Jt Cu Sm 20° Jt Cu Sm Black silt sn Fz
	151.0	15.0		15 / 117								40		
	150.0	16.0		16 / 106			15.70 m: Potassium felspar and quartz rich core, medium grained, red. 16.40 m: Quartz vein, very stained.					24		45° Jt Cu Sm Rusty sn Cz 45° Jt Cu Sm sn 45° Jt Pl Sm infill cg 80° Jt Pl Sm Rusty sn Dl 50° Jt Cu Sm
	149.0	17.0					To Target Depth. **Drillhole BH18-102-2 terminated at 16.9m.**							
	148.0	18.0												
	147.0	19.0												
	146.0	20.0												

Notes:

Defect Description Legend

Planarity		Type				Roughness		Infill Amount	
Pl	Planar	Dl	Drilling Induced	Sm	Seam	Ro	Rough	cn	Clean
Ir	Irregular	Jt	Joint	Cz	Crushed Zone	Sm	Smooth	sn	Stained
Cu	Curved	Pt	Parting on Contact	Fz	Fractured Zone	Po	Polished	vn	Veneer
Un	Undulose	Sh	Shear Seam	Band	Weak Band	Sl	Slickenside	cg	Coating
St	Stepped	Cs	Crushed Seam						

BOREHOLE REPORT

BH18-BR15-1
Sheet 1 of 3

Client: Baffinland Iron Mine
Project: Mary River Expansion Study
Location: Bridge 15 (Kilometer 18)

Project No.: H353004
Datum: NAD83
Platform:

Easting: 555,758.0 m
Northing: 7,915,441.0 m
Surface Elevation: 78.00 m
Bottom Elevation: 60.63 m
Total Depth: 17.4 m
Logged By: MY/PS
Reviewed By:

Contractor: Boart Longyear
Driller: Brent McAndrew
Rig Type/ Mounting: Sonic Drill Rig
Hole Diameter (mm): 100
Date Logged: 3/11/2018
Date Reviewed:

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description (TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.)	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 25 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	78.0	0.0				SNOW	ICE										
						ICE	ICE										
	77.0	1.0				SILTY SAND, some GRAVEL: fine to medium grained sand, brownish grey.	Nf inferred										
	76.0	2.0					Possible ice feature, all melted.				6	34	44	22			
	75.0	3.0															
	74.0	4.0				4.20 m - 4.30 m: Boulder inferred with silty sand layer.					11	6	57	37			
	73.0	5.0									7						
	72.0	6.0															
	71.0	7.0															
	70.0	8.0	Mini Sonic Drilling Rig BL100			COBBLES and BOULDERS: Cobble at 7.75 m and 8.90 m.											
	69.0	9.0															
	68.0	10.0				MUD SLURRY with GRAVEL to COBBLES: Coarse gravel (26 mm).	Nf inferred										

Notes:

BOREHOLE REPORT

BH18-BR15-1
Sheet 2 of 3

Client: Baffinland Iron Mine
Project: Mary River Expansion Study
Location: Bridge 15 (Kilometer 18)

Project No.: H353004
Datum: NAD83
Platform:

Easting: 555,758.0 m
Northing: 7,915,441.0 m
Surface Elevation: 78.00 m
Bottom Elevation: 60.63 m
Total Depth: 17.4 m
Logged By: MY/PS
Reviewed By:

Contractor: Boart Longyear
Driller: Brent McAndrew
Rig Type/ Mounting: Sonic Drill Rig
Hole Diameter (mm): 100
Date Logged: 3/11/2018
Date Reviewed:

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 25 – 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
						ROCK: 60% mafic, 10-15% red mineral, 10% black elongate, reflective. Refusal on hard rock.											
	67.0	11.0				***Start of Coring at 10.7m.***											
						Continued on Rock Core Log sheet.											
	66.0	12.0															
	65.0	13.0															
	64.0	14.0															
	63.0	15.0															
	62.0	16.0															
	61.0	17.0															
	60.0	18.0															
	59.0	19.0															
	58.0	20.0															

Notes:

BOREHOLE LOG

ROCK CORE FORMAT

BH18-BR15-1

Sheet 3 of 3

Client: Baffinland Iron Mine

Project: Mary River Expansion Study

Location: Bridge 15 (Kilometer 18)

Project No.: H353004

Datum: NAD83

Platform:

Easting: 555,758.0 m

Northing: 7,915,441.0 m

Surface Elevation: 78.00 m

Bottom Elevation: 60.63 m

Total Depth: 17.4 m

Logged By: MY/PS

Reviewed By:

Contractor: Boart Longyear **Rig Type/ Mounting:** Sonic Drill Rig **Bearing:** N/A° **Date Logged:** 3/11/2018

Driller: Brent McAndrew **Hole Diameter (mm):** 100 **Plunge:** ° **Date Checked:**

Water	Elevation (m)	Depth (m)	Method	Run #/TCR	Graphic Log	Geological Unit	Rock Description: ROCK TYPE; Grain size, texture and fabric, colour, general defect conditions, minor constituents.	Weathering/ Cementation	Estimated Strength (EH VH H M L VL EL)	$Is_{(50)}$ [UCS] MPa	Defect Spacing mm (2000 600 200 [100] 60 20)	RQD %	Defect Log	Defect Description: Inclination, type, infill, amount, aperture, planarity, roughness, frequency (Specific / General)
							Resuming in Rock Core Format 10.7m.							
	67.0	11.0		1 / 130			BEDROCK: Granitic gneiss alternating with mafic bands.					52		Fz 3° Jt Pl Sm 5° Jt Pl Sm
	66.0	12.0		2 / 105								76		Dl 40° Jt Pl Sm 10° Jt Pl Sm cg
	65.0	13.0		3 / 96			12.58 m: Mafic matrix with white minerals peppered throughout, medium grain size.					43		90° Jt Pl Sm 85° Jt Pl Sm 90° Jt Pl Ro 90° Jt Pl Sm 75° Jt Pl Sm Fz 0° Jt Pl Sm Soil cg Cz
	64.0	14.0		4 / 154								92		30° Jt Pl Ro Rust staining sn 80° Jt Pl Ro Rust staining sn 90° Jt Pl Sm 45° Jt Pl Ro Rust sn 30° Jt Pl 30° Jt Pl Sm Darker staining 0° Jt Pl Ro
	63.0	15.0		5 / 101			14.80 m - 15.85 m: Dark mafic to ultramafic matrix, black visable minerals.					86		45° Jt Pl Sm 45° Jt Pl Sm 70° Jt Pl Ro Dl Fz
	62.0	16.0		6 / 99			15.85 m - 15.95 m: Granitic gneiss. 15.95 m - 17.22 m: Mafic matrix.					95		Dl 45° Jt Pl Sm
	61.0	17.0					17.22 m: Mafic matrix with red banding, granitic gneiss.							45° Jt Pl Sm Some staining, infill cg Dl 40° Jt Pl Sm Staining sn
	60.0	18.0					To Target Depth. **Drillhole BH18-BR15-1 terminated at 17.4m.**							
	59.0	19.0												
	58.0	20.0												

Notes:

Defect Description Legend

Planarity		Type				Roughness		Infill Amount	
Pl	Planar	Dl	Drilling Induced	Sm	Seam	Ro	Rough	cn	Clean
Ir	Irregular	Jt	Joint	Cz	Crushed Zone	Sm	Smooth	sn	Stained
Cu	Curved	Pt	Parting on Contact	Fz	Fractured Zone	Po	Polished	vn	Veneer
Un	Undulose	Sh	Shear Seam	Band	Weak Band	Sl	Slickenside	cg	Coating
St	Stepped	Cs	Crushed Seam						

BOREHOLE REPORT

BH18-BR15-2

Sheet 1 of 3

Client: Baffinland Iron Mine

Project: Mary River Expansion Study

Location: Bridge 15 (Kilometer 18)

Project No.: H353004

Datum: NAD83

Platform:

Easting: 514,211.0 m

Northing: 7,965,645.0 m

Surface Elevation: 78.00 m

Bottom Elevation: 61.20 m

Total Depth: 16.8 m

Logged By: MY/PS

Reviewed By:

Contractor: Boart Longyear

Driller: Brent McAndrew

Rig Type/ Mounting: Sonic Drill Rig

Hole Diameter (mm): 100

Date Logged: 3/12/2018

Date Reviewed:

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 25 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	78.0	0.0	Mini Sonic Drilling Rig BL100			ICE	ICE										
	77.0	1.0				BOULDERS to COBBLES: Grey with red viens.	Nf										
						SAND, trace SILT: Fine to medium grained, light brown, red, and black.	Nbn - Vx				14	1	85	14			
	76.0	2.0				SANDY SILT: Grey.	Nbn			>>	63	1	45	54			
						SILTY SAND, trace to some GRAVEL: Fine to medium grained, brownish grey.					9	29	39	32			
	75.0	3.0					Nf										
	74.0	4.0				3.90 m: Trace boulders, sub-rounded to rounded gravel and boulders.					11	14	60	26			
	73.0	5.0				5.20 m: Some gravel, trace boulders.	Nf inferred										
	72.0	6.0									5	22	48	30			
	71.0	7.0															
	70.0	8.0				7.80 m: Trace cobbles.											
	69.0	9.0				8.50 m - 8.70 m: Trace boulders, coarsening downwards, sub-angular to sub-rounded.											
	68.0	10.0				9.45 m - 9.80 m: Boulders, dark matrix with granitic crystals.	Nf										

Notes:

BOREHOLE REPORT

BH18-BR15-2
Sheet 2 of 3

Client: Baffinland Iron Mine
Project: Mary River Expansion Study
Location: Bridge 15 (Kilometer 18)

Project No.: H353004
Datum: NAD83
Platform:

Easting: 514,211.0 m
Northing: 7,965,645.0 m
Surface Elevation: 78.00 m
Bottom Elevation: 61.20 m
Total Depth: 16.8 m
Logged By: MY/PS
Reviewed By:

Contractor: Boart Longyear
Driller: Brent McAndrew
Rig Type/ Mounting: Sonic Drill Rig
Hole Diameter (mm): 100
Date Logged: 3/12/2018
Date Reviewed:

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 25 – 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
						10.00 m - 10.15 m: Boulders, dark matrix with granitic crystals. ***Start of Coring at 10.2m.*** ***Continued on Rock Core Log sheet.***											
	67.0	11.0															
	66.0	12.0															
	65.0	13.0															
	64.0	14.0															
	63.0	15.0															
	62.0	16.0															
	61.0	17.0															
	60.0	18.0															
	59.0	19.0															
	58.0	20.0															

Notes:

BOREHOLE LOG

ROCK CORE FORMAT

BH18-BR15-2

Sheet 3 of 3

Client: Baffinland Iron Mine

Project: Mary River Expansion Study

Location: Bridge 15 (Kilometer 18)

Project No.: H353004

Datum: NAD83

Platform:

Easting: 514,211.0 m

Northing: 7,965,645.0 m

Surface Elevation: 78.00 m

Bottom Elevation: 61.20 m

Total Depth: 16.8 m

Logged By: MY/PS

Reviewed By:

Contractor: Boart Longyear **Rig Type/ Mounting:** Sonic Drill Rig **Bearing:** N/A° **Date Logged:** 3/12/2018

Driller: Brent McAndrew **Hole Diameter (mm):** 100 **Plunge:** ° **Date Checked:**

Water	Elevation (m)	Depth (m)	Method	Run #/TCR	Graphic Log	Geological Unit	Rock Description ROCK TYPE; Grain size, texture and fabric, colour, general defect conditions, minor constituents	Weathering/ Cementation	Estimated Strength (EH VH H M L VL EL)	$Is_{(50)}$ [UCS] MPa	Defect Spacing mm (2000 600 200 [100] 60 20)	RQD %	Defect Log	Defect Description Inclination, type, infill, amount, aperture, planarity, roughness, frequency Specific / General
							Resuming in Rock Core Format 10.2m.							
	67.0	11.0					BEDROCK: Granitic gneiss, grey matrix with red veins. 10.70 m - 11.10 m: mafic matrix with plagioclase and granitic banding (gneissic banding). Crushed rock, up to 30 cm.							
	66.0	12.0												
	65.0	13.0												
	64.0	14.0					13.70 m - 13.85 m: Pulverized rock.							
	63.0	15.0												
	62.0	16.0					15.50 m: Thicker plagioclase beds, thicker clasts (granite)							
	61.0	17.0					To Target Depth. **Drillhole BH18-BR15-2 terminated at 16.8m.**							
	60.0	18.0												
	59.0	19.0												
	58.0	20.0												

Notes:

Defect Description Legend

Planarity		Type				Roughness		Infill Amount	
Pl	Planar	Dl	Drilling Induced	Sm	Seam	Ro	Rough	cn	Clean
Ir	Irregular	Jt	Joint	Cz	Crushed Zone	Sm	Smooth	sn	Stained
Cu	Curved	Pt	Parting on Contact	Fz	Fractured Zone	Po	Polished	vn	Veneer
Un	Undulose	Sh	Shear Seam	Band	Weak Band	Sl	Slickenside	cg	Coating
St	Stepped	Cs	Crushed Seam						

BOREHOLE REPORT

BH18-BR70-1

Sheet 1 of 5

Client: Baffinland Iron Mine

Project: Mary River Expansion Study

Location: Proposed Bridge 70 Abutment

Project No.: H353004

Datum: NAD83

Platform:

Easting: 529,138.0 m

Northing: 7,916,667.0 m

Surface Elevation: 124.00 m

Bottom Elevation: 91.50 m

Total Depth: 32.5 m

Logged By: YF/MY

Reviewed By:

Contractor: Boart Longyear

Rig Type/ Mounting: Sonic Drill Rig

Date Logged: 4/13/2018

Driller: Brent McAndrew

Hole Diameter (mm): 100

Date Reviewed:

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 25 – 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	124.0	0.0				SILTY SAND: Greyish brown, fine to medium grained.	Nbn										
	123.0	1.0															
	122.0	2.0															
	121.0	3.0				3.00 m: Saline smelling dark organic layer. 3.30 m: Banding of silt. 3.70 m: Organic layer.	Nbn to Vx				22	0	97	3			
	120.0	4.0				4.20 m: Micaceous minerals, organics.	Vs										
	119.0	5.0															
	118.0	6.0					Nbn										
	117.0	7.0									28	0	80	20			
	116.0	8.0				7.60 m: Interbedded silt and organic layers, pungent organics.	Vr to Vx										
	115.0	9.0				ICE and SOIL: Silt, trace sand, grey.	I+S				36	0	3	97			
	114.0	10.0															

Notes:

BOREHOLE REPORT

BH18-BR70-1
Sheet 2 of 5

Client: Baffinland Iron Mine
Project: Mary River Expansion Study
Location: Proposed Bridge 70 Abutment

Project No.: H353004
Datum: NAD83
Platform:

Easting: 529,138.0 m
Northing: 7,916,667.0 m
Surface Elevation: 124.00 m
Bottom Elevation: 91.50 m
Total Depth: 32.5 m
Logged By: YF/MY
Reviewed By:

Contractor: Boart Longyear
Driller: Brent McAndrew
Rig Type/ Mounting: Sonic Drill Rig
Hole Diameter (mm): 100
Date Logged: 4/13/2018
Date Reviewed:

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 25 – 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
						ICE and SOIL: Silt, trace sand, grey. *(Continued)*	I+S *(Continued)*										
						SILTY SAND: Brownish grey, stratified, possible laminated organics.	Nbn										
	113.0	11.0				11.30 m - 11.45 m: Clay layers.					19	0	39	61			
	112.0	12.0				11.80 m - 12.00 m: Inferred boulder.											
						12.25 m - 12.30 m: Trace gravel, grey.											
	111.0	13.0				12.70 m - 13.05 m: Inferred boulder.											
						13.30 m: Cobbles.											
	110.0	14.0				SANDY SILT, trace GRAVEL: Grey.	Nbn				15	9	51	40			
	109.0	15.0				15.20 m, 16.40 m: Cobbles, greyish brown.											
	108.0	16.0									14	19	26	55			
	107.0	17.0				17.40 m - 18.00 m: Boulders	Nbn inferred										
	106.0	18.0				SANDY SILT, trace CLAY: Dark grey.	Nbn inferred										
						SILT, trace GRAVEL, trace SAND: Grey, coarse grained sand.	Nbn inferred										
	105.0	19.0															
	104.0	20.0				19.80 m - 21.70 m: Trace to some											

Notes:

BOREHOLE REPORT

BH18-BR70-1
Sheet 3 of 5

Client: Baffinland Iron Mine
Project: Mary River Expansion Study
Location: Proposed Bridge 70 Abutment

Project No.: H353004
Datum: NAD83
Platform:

Easting: 529,138.0 m
Northing: 7,916,667.0 m
Surface Elevation: 124.00 m
Bottom Elevation: 91.50 m
Total Depth: 32.5 m
Logged By: YF/MY
Reviewed By:

Contractor: Boart Longyear
Driller: Brent McAndrew
Rig Type/ Mounting: Sonic Drill Rig
Hole Diameter (mm): 100
Date Logged: 4/13/2018
Date Reviewed:

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 / 25 / 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	103.0	21.0				angular fine to medium gravel, trace cobbles. SILT, trace GRAVEL, trace SAND: Grey, coarse grained sand. *(Continued)*	Nbn inferred *(Continued)*										
	102.0	22.0				21.70 m: Angular gravel in a silt matrix. Inferred as rock flour, cobbles, gravel, boulders, white to grey dust.											
	101.0	23.0				BEDROCK (Inferred): Rock dust.											
	100.0	24.0															
	99.0	25.0															
	98.0	26.0				***Start of Coring at 25.9m.*** ***Continued on Rock Core Log sheet.***											
	97.0	27.0															
	96.0	28.0															
	95.0	29.0															
	94.0	30.0															

Notes:

BOREHOLE LOG

ROCK CORE FORMAT

BH18-BR70-1

Sheet 4 of 5

Client: Baffinland Iron Mine

Project: Mary River Expansion Study

Location: Proposed Bridge 70 Abutment

Project No.: H353004

Datum: NAD83

Platform:

Easting: 529,138.0 m

Northing: 7,916,667.0 m

Surface Elevation: 124.00 m

Bottom Elevation: 91.50 m

Total Depth: 32.5 m

Logged By: YF/MY

Reviewed By:

Contractor: Boart Longyear **Rig Type/ Mounting:** Sonic Drill Rig **Bearing:** N/A° **Date Logged:** 4/13/2018

Driller: Brent McAndrew **Hole Diameter (mm):** 100 **Plunge:** ° **Date Checked:**

Water	Elevation (m)	Depth (m)	Method	Run #/TCR	Graphic Log	Geological Unit	Rock Description: ROCK TYPE; Grain size, texture and fabric, colour, general defect conditions, minor constituents.	Weathering/ Cementation	Estimated Strength (EH VH H M L VL EL)	$Is_{(50)}$ [UCS] MPa	Defect Spacing mm (2000 600 200 [100] 60 20)	RQD %	Defect Log	Defect Description: Inclination, type, infill, amount, aperture, planarity, roughness, frequency (Specific / General)
	103.0	21.0												
	102.0	22.0												
	101.0	23.0												
	100.0	24.0												
	99.0	25.0					***Resuming in Rock Core Format 25.9m.***							
	98.0	26.0		18 / 101			BEDROCK: Siltstone to dolomitic limestone, grey with dark grey / black streaks, fine to very fine grained, medium strong rock. 25.98 m - 27.02 m: Silt seams.					64		90° Jt Pl Sm 90° Jt Pl Sm Silt, light brown cg Dl 90° Jt Pl Sm 90° Jt Pl Sm Yellowish brown coating cg 90° Jt Pl Sm Silt cg 90° Jt Pl Sm Some silt cg 90° Jt Pl Sm Silt cg 90° Jt Pl Sm Sm 90° Jt Pl Sm 90° Jt Pl Sm 90° Jt Pl Sm Sm 90° Jt Pl Sm 90° Jt Pl Sm 90° Jt Pl Sm 90° Jt Pl Sm 90° Jt Pl Sm Sm 90° Jt Pl Sm 90° Jt Pl Sm Silt cg 90° Jt Pl Sm Silt cg 90° Jt Pl Sm 90° Jt Pl Sm 90° Jt Pl Sm 90° Jt Pl Sm 90° Jt Pl Sm 80° Jt Pl Sm 90° Jt Pl Sm Fz 90° Jt Ir Ro
	97.0	27.0					27.32 m - 27.36 m: Silt seams. 27.40 m - 28.60 m: Irregular black bands, bioturbated with mud seams, strong rock (excepting weak seams). 27.82 m - 27.83 m: Silt seams.							
	96.0	28.0		19 / 72								42		
	95.0	29.0		20 / 86			28.60 m - 29.50 m: No visible mud, but some core loss.					83		
	94.0	30.0					29.50 m - 31.00 m: Bioturbated, 5 cm mud seam, strong rock.					58		

Notes:

Defect Description Legend

Planarity		Type				Roughness		Infill Amount	
Pl	Planar	Dl	Drilling Induced	Sm	Seam	Ro	Rough	cn	Clean
Ir	Irregular	Jt	Joint	Cz	Crushed Zone	Sm	Smooth	sn	Stained
Cu	Curved	Pt	Parting on Contact	Fz	Fractured Zone	Po	Polished	vn	Veneer
Un	Undulose	Sh	Shear Seam	Band	Weak Band	Sl	Slickenside	cg	Coating
St	Stepped	Cs	Crushed Seam						

BOREHOLE LOG

ROCK CORE FORMAT

BH18-BR70-1

Sheet 5 of 5

Client: Baffinland Iron Mine

Project: Mary River Expansion Study

Location: Proposed Bridge 70 Abutment

Project No.: H353004

Datum: NAD83

Platform:

Easting: 529,138.0 m

Northing: 7,916,667.0 m

Surface Elevation: 124.00 m

Bottom Elevation: 91.50 m

Total Depth: 32.5 m

Logged By: YF/MY

Reviewed By:

Contractor: Boart Longyear **Rig Type/ Mounting:** Sonic Drill Rig **Bearing:** N/A° **Date Logged:** 4/13/2018

Driller: Brent McAndrew **Hole Diameter (mm):** 100 **Plunge:** ° **Date Checked:**

Water	Elevation (m)	Depth (m)	Method	Run #/TCR	Graphic Log	Geological Unit	Rock Description (ROCK TYPE; Grain size, texture and fabric, colour, general defect conditions, minor constituents.)	Weathering/ Cementation	Estimated Strength (EH VH H M L VL EL)	$Is_{(50)}$ [UCS] MPa	Defect Spacing mm (2000 600 200 [100] 60 20)	RQD %	Defect Log	Defect Description (Inclination, type, infill, amount, aperture, planarity, roughness, frequency) Specific / General
	93.0	31.0		21 / 103			BEDROCK: Siltstone to dolomitic limestone, grey with dark grey / black streaks, fine to very fine grained, medium strong rock. *(Continued)*					58		90° Jt Pl Sm Silt cg 90° Jt Pl Sm Sm 90° Jt Ir Ro 90° Jt Pl Sm 90° Jt Pl Sm 90° Jt Pl Sm Silt cg Fz 90° Jt Pl Ro Dl
	92.0	32.0		22 / 103								95		
	91.0	33.0					To Target Depth. **Drillhole BH18-BR70-1 terminated at 32.5m.**							
	90.0	34.0												
	89.0	35.0												
	88.0	36.0												
	87.0	37.0												
	86.0	38.0												
	85.0	39.0												
	84.0	40.0												

Notes:

Defect Description Legend

Planarity		Type				Roughness		Infill Amount	
Pl	Planar	Dl	Drilling Induced	Sm	Seam	Ro	Rough	cn	Clean
Ir	Irregular	Jt	Joint	Cz	Crushed Zone	Sm	Smooth	sn	Stained
Cu	Curved	Pt	Parting on Contact	Fz	Fractured Zone	Po	Polished	vn	Veneer
Un	Undulose	Sh	Shear Seam	Band	Weak Band	Sl	Slickenside	cg	Coating
St	Stepped	Cs	Crushed Seam						

BOREHOLE REPORT

BH18-BR70-2
Sheet 1 of 4

Client: Baffinland Iron Mine
Project: Mary River Expansion Study
Location: Proposed Bridge 70 Abutment

Project No.: H353004
Datum: NAD83
Platform:

Easting: 529,107.0 m
Northing: 7,916,700.0 m
Surface Elevation: 124.00 m
Bottom Elevation: 95.50 m
Total Depth: 28.5 m
Logged By: YF/MY
Reviewed By:

Contractor: Boart Longyear
Driller: Brent McAndrew
Rig Type/ Mounting: Sonic Drill Rig
Hole Diameter (mm): 100
Date Logged: 4/17/2018
Date Reviewed:

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description: TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 – 25 – 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	124.0	0.0				SAND, trace to some SILT: Light brown, fine to medium grained.	Nbn										
	123.0	1.0									1	38	47	15			
											20	0	86	14			
							Nbe										
	122.0	2.0															
	121.0	3.0															
											15	0	91	9			
	120.0	4.0															
	119.0	5.0															
	118.0	6.0				6.10 m: With fine black organic layers.											
	117.0	7.0				7.00 m - 7.10 m: Silt, some sand.											
						SAND interbedded with SILT.	Nbe										
	116.0	8.0				8.30 m: Becoming finer with depth.	Vr										
	115.0	9.0				ICE: 40% soil	ICE										
						SILT, some CLAY: Dark brown.	Vr - Vs										
											23	0	2	98			
	114.0	10.0				9.70 m - 10.10 m: Ice lenses, snow like.											

Notes:

BOREHOLE REPORT

BH18-BR70-2
Sheet 2 of 4

Client: Baffinland Iron Mine
Project: Mary River Expansion Study
Location: Proposed Bridge 70 Abutment

Project No.: H353004
Datum: NAD83
Platform:

Easting: 529,107.0 m
Northing: 7,916,700.0 m
Surface Elevation: 124.00 m
Bottom Elevation: 95.50 m
Total Depth: 28.5 m
Logged By: YF/MY
Reviewed By:

Contractor: Boart Longyear
Driller: Brent McAndrew
Rig Type/ Mounting: Sonic Drill Rig
Hole Diameter (mm): 100
Date Logged: 4/17/2018
Date Reviewed:

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile 0 25 50	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	113.0	11.0				SILT, some CLAY: Dark brown. *(Continued)* 10.50 m - 10.70 m: Fine to medium sand, trace silt. 10.70 m - 10.75 m: Ice, snow like. 10.75 m: Fine sand, interbedded with darker brown silt.	Vr - Vs *(Continued)* Nbn Vr										
	112.0	12.0				SILTY SAND, trace GRAVEL: Dark brown with layers of yellow, angular gravel. 12.70 m - 12.90 m: White to grey limestone cobbles. 12.90 m: Fine to medium gravel, angular to sub-rounded. 13.60 m - 13.70 m: Becoming darker brown.											
	110.0	14.0				COBBLES: Limestone in possible rock floor. 14.90 m - 15.20 m: Highly disturbed, dark grey wilt wirh angular gravel, inferred rock. 15.20 m - 16.80 m: Potential bedrock surface, grey angular gravel size pieces in majority crushed grey silt sized matrix. 17.10 m: Fractured rock, weathered top layer, 5 mm pockets of silt with 10 cm silt pocket below, very fine grained, laminated to fractured to full of holes. 18.30 m - 18.75 m: Loss of fines. 18.75 m - 19.30 m: Laminated, very fine grained. 19.35 m - 19.60 m: Silt, grey, pieces of rock, likely bedrock, thin horizontal laminations, smooth, horizontal	Nf inferred					0	2	98			
	104.0	20.0															

Notes:

BOREHOLE REPORT

BH18-BR70-2
Sheet 3 of 4

Client: Baffinland Iron Mine
Project: Mary River Expansion Study
Location: Proposed Bridge 70 Abutment

Project No.: H353004
Datum: NAD83
Platform:

Easting: 529,107.0 m
Northing: 7,916,700.0 m
Surface Elevation: 124.00 m
Bottom Elevation: 95.50 m
Total Depth: 28.5 m
Logged By: YF/MY
Reviewed By:

Contractor: Boart Longyear
Driller: Brent McAndrew
Rig Type/ Mounting: Sonic Drill Rig
Hole Diameter (mm): 100
Date Logged: 4/17/2018
Date Reviewed:

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile (0 25 50)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	103.0	21.0				fractures, silt seams present. COBBLES: Limestone in possible rock floor. *(Continued)* ~~21.20~~ m - 22.10 m: Fractured zone, fresh, strong. ***Start of Coring at 21.3m.*** ***Continued on Rock Core Log sheet.***											
	102.0	22.0															
	101.0	23.0															
	100.0	24.0															
	99.0	25.0															
	98.0	26.0															
	97.0	27.0															
	96.0	28.0															
	95.0	29.0															
	94.0	30.0															

Notes:

BOREHOLE LOG

ROCK CORE FORMAT

BH18-BR70-2

Sheet 4 of 4

Client: Baffinland Iron Mine

Project: Mary River Expansion Study

Location: Proposed Bridge 70 Abutment

Project No.: H353004

Datum: NAD83

Platform:

Easting: 529,107.0 m

Northing: 7,916,700.0 m

Surface Elevation: 124.00 m

Bottom Elevation: 95.50 m

Total Depth: 28.5 m

Logged By: YF/MY

Reviewed By:

Contractor: Boart Longyear **Rig Type/ Mounting:** Sonic Drill Rig **Bearing:** N/A° **Date Logged:** 4/17/2018

Driller: Brent McAndrew **Hole Diameter (mm):** 100 **Plunge:** ° **Date Checked:**

Water	Elevation (m)	Depth (m)	Method	Run #/TCR	Graphic Log	Geological Unit	Rock Description ROCK TYPE; Grain size, texture and fabric, colour, general defect conditions, minor constituents.	Weathering/ Cementation	Estimated Strength (EH VH H M L VL EL)	$Is_{(50)}$ [UCS] MPa	Defect Spacing mm (2000 600 200 [100] 60 20)	RQD %	Defect Log	Defect Description Inclination, type, infill, amount, aperture, planarity, roughness, frequency Specific / General
	103.0	21.0					***Resuming in Rock Core Format 21.3m.***							
	102.0	22.0					BEDROCK: Siltstone to dolomitic limestone. 22.10 m - 24.00 m: Fractured, crystal filled (white, medium grade) voids from 23.30 m, fresh, strong.							
	101.0	23.0												
	100.0	24.0					24.00 m - 25.50 m: Void to 24.40 m, becoming beige 24.50 m - 24.70 m, mottled.							
	99.0	25.0												
	98.0	26.0					25.50 m - 27.00 m: Beige mottled from 25.60 m - 26.00 m, decreasing in beige concentrate after, fresh.							
	97.0	27.0					27.00 m - 28.50 m: Beige mottled grey mudstone, becoming more banded, strong, fresh, one vein at 28.00 m.							
	96.0	28.0												
	95.0	29.0					To Target Depth. **Drillhole BH18-BR70-2 terminated at 28.5m.**							
	94.0	30.0												

Notes:

Defect Description Legend

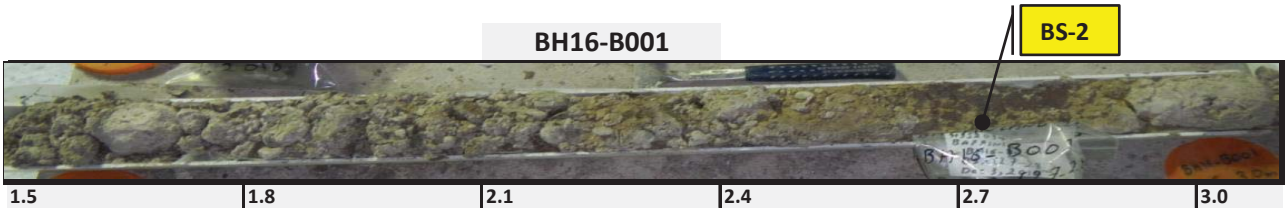
Planarity		Type				Roughness		Infill Amount	
Pl	Planar	Dl	Drilling Induced	Sm	Seam	Ro	Rough	cn	Clean
Ir	Irregular	Jt	Joint	Cz	Crushed Zone	Sm	Smooth	sn	Stained
Cu	Curved	Pt	Parting on Contact	Fz	Fractured Zone	Po	Polished	vn	Veneer
Un	Undulose	Sh	Shear Seam	Band	Weak Band	Sl	Slickenside	cg	Coating
St	Stepped	Cs	Crushed Seam						

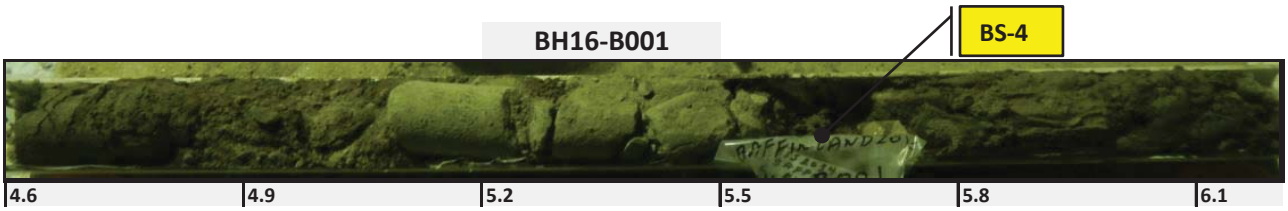
Appendix C
Sample Photographs

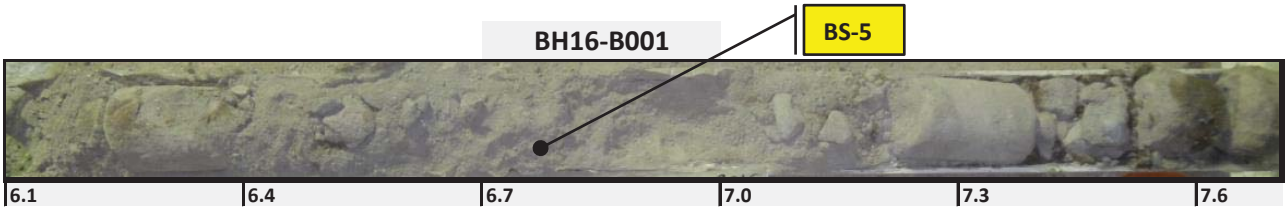
HATCH

Sample Photographs

Borehole Name:	BH16-B001	Mary River 12 MTPA Mine Expansion
Location:	17 W 514191 7965675	Pre-feasibility Study
Completion Date:	3/12/2016	Baffinland Iron Mines







HATCH

BS-7

BH16-B001

9.1 | 9.4 | 9.8 | 10.1 | 10.4 | 10.7

BS-8

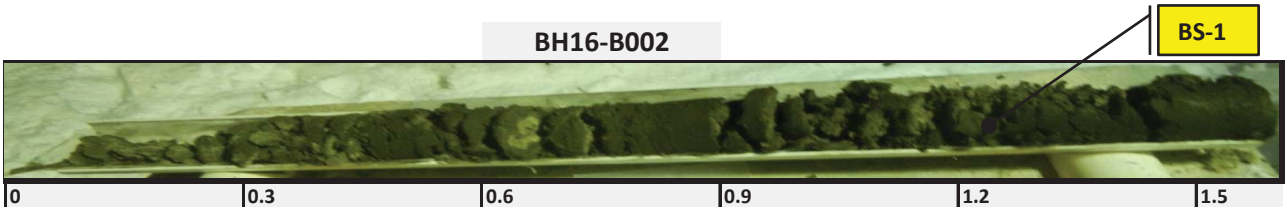
BH16-B001

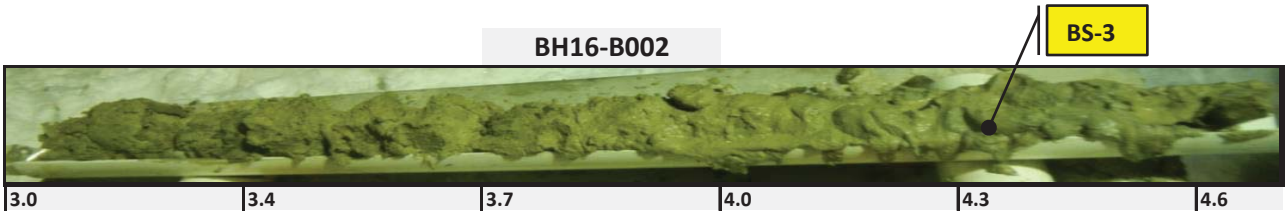
10.7 | 11.0 | 11.3 | 11.6 | 11.9 | 12.2

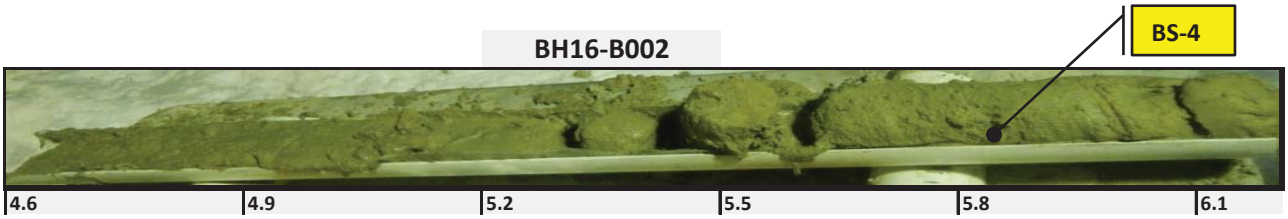
HATCH

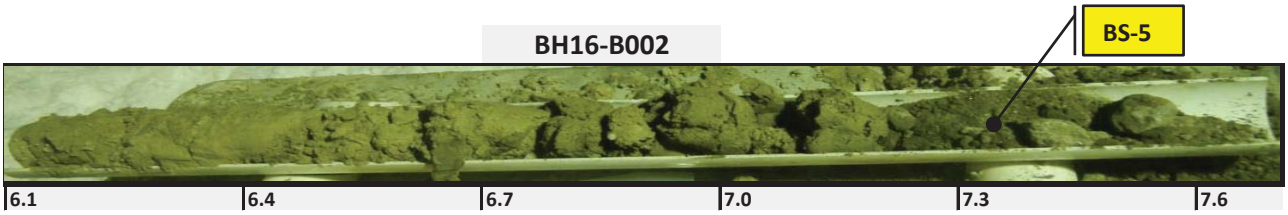
Sample Photographs

Borehole Name:	BH16-B002	Mary River 12 MTPA Mine Expansion
Location:	17 W 514290 7965604	Pre-feasibility Study
Completion Date:	2/12/2016	Baffinland Iron Mines

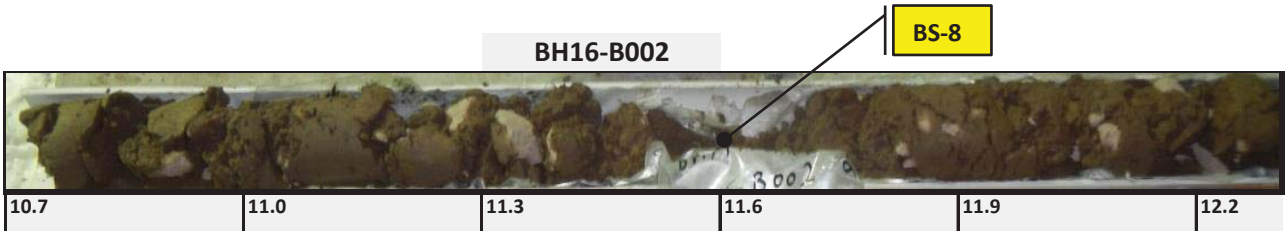









BH16-B002
BS-7
9.1
9.4
9.8
10.1
10.4
10.7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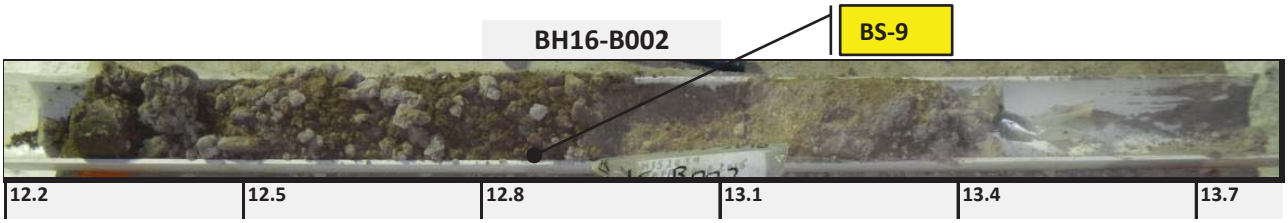
BS-8
10.7
11.0
11.3
11.6
11.9
12.2


BH16-B002
BS-9
12.2
12.5
12.8
13.1
13.4
13.7

HATCH

Sample Photographs

Borehole Name:	BH16-B003	Mary River 12 MTPA Mine Expansion
Location:	17 W 514357 7965533	Pre-feasibility Study
Completion Date:	2/12/2016	Baffinland Iron Mines