



Baffinland Iron Mines Corporation Mary River Expansion Project

2016-2017-2018 Rail Geotechnical Investigation Factual Data Report

Use	-			R Stefan		
Approved for Use	H Ghiabi	W Hoyle	D Stanger D Stanger	R Stefan		
Status	Prepared By	Checked By	Approved By	Approved By		
Use Statistics						





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

This Report has been prepared by Hatch Ltd. ("Hatch") for the sole and exclusive benefit of Baffinland Iron Mines Corporation (the "Client") for the sole purpose of assisting the Client to identify potential options to increase production from the Mary River mine, and may not be provided to, used or relied upon by any other party without the prior written consent of Hatch.

Any use of this report by the Client is subject to the terms and conditions provided in the ArcelorMittal General Service Agreement, dated November 14, 2014, including the limitations on liability set out therein. Without limiting the foregoing, Hatch explicitly disclaims all responsibility for losses, claims, expenses or damages, if any, suffered by a third party as a result of any reliance on this Report, including for any decisions made or actions made by such a third party and based on this Report ("Claims"), and such third party's use or review of the Report shall constitute its agreement to waive all such Claims and release Hatch in respect thereof.

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:	
Name:	
Title:	
Date:	





Table of Contents

1.	Introduction	1
	Previous Investigations Local Topology and Geology	
2.	. 0	
	•	
	2.1 General	
	Borehole Locations 2.3 Drilling and Sampling Methodology	
	3 1 - 3	
	Safety Management Plan Laboratory Testing	
	2.5.1 Soil Testing	
	2.5.2 Rock Testing	
	2.6 Geophysics	10
3.	Investigation Results	12
	3.1 Rail Alignment	10
	3.1.1 Chainage 0+000 m to 54+000 m	12 12
	3.1.2 Chainage 54+000 m to 58+000 m	13
	3.1.3 Chainage 58+000 m to 70+000 m	
	3.1.4 Chainage 70+000 m to 100+000 m	
	3.2 Proposed Bridge Locations	
	3.2.1 Bridge 1	
	3.2.2 Bridge 2	
	3.2.3 Bridge 3	
	3.2.4 Bridge 4	
	3.3 Proposed Quarry Boreholes	
	3.3.2 Bedrock	
	3.4 Laboratory Test Results	
	3.5 Geophysics Results	
	3.6 Ice Rich Areas	
	3.7 Georadar Surveys Along the Rail Deviation Area	
4.	Summary of Findings	18
5	References	22





List of Tables

Гable 2-1: Rail Alignment Borehole Locations	
Table 2-2: Bridge Abutment Borehole Locations	
Table 2-3: Quarry Borehole Locations	
Table 2-4: Standards Used for the 2016 and 2017 Geotechnical Investigation	
Fable 2-5: Standards for Testing of Coarse Aggregate	
Fable 2-6: Rock Type and Location of The Tested Samples	
Fable 3-1: Physical Test Results of The Crushed Aggregate Samples	
Fable 3-2: Boreholes With Significant Ice Content	18
Fable 4-1: Primary Materials along Rail Alignment	18
List of Figures	
Figure 1: Drilling Rig Setup on a Borehole	6
Figure 2: Survival Shack and Off-Road Transport	
Figure 3: Sample Collected in a PVC Split Using a Mini Sonic Drilling Rig	
Figure 4: Ground Penetrating Radar Survey Unit	
Figure 5: GPR Survey in Progress	
Figure 6: Setup for Seismic Refraction	
Figure 7: Typical Granitic Gneiss Bedrock Outcrop	
Figure 8: Typical Sand Encountered in Boreholes Located between Chainage km 54 and km 58 (BH	
R037)	
Figure 9: Typical Dolomitic Limestone Outcrop	
Figure 10: Typical Soil Encountered between Chainage 78+000 m and 90+000 m (BH16-C016)	
Figure 11: Ground Ice at Km 47, 1.5 m to 3 m Deep (BH16-C011)	
·g · · · · · · · · · · · · · · · · ·	

List of Appendices

Appendix A Borehole Location Plan

Appendix B Borehole Reports

Appendix C Sample Photographs

Appendix D Laboratory Reports

Appendix E Fence Diagrams

Appendix F Summary of Laboratory Results

Appendix G Laboratory Certificate of Conformance

Appendix H Coarse Aggregate Physical Testing Reports

Appendix I Geological Investigation Safety Plan

Appendix J Geophysics Assessment





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	509,249 7,968,499	
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	521,842 7,949,969	
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	7,930,909	9.1
BH16-C010	522,513	7,946,728	5.5
BH16-C011	525,427	7,937,567	10.6
BH16-C012	526,569	7,937,567	4.6
BH16-C015			
BH16-C016	536,142	7,918,691	7.6 7.6
	536,362	7,918,814	
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	528,253 7,929,081	
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.

2





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	Depth	UTM Coordinates	UTM Coordinates Rock		Sample
Borellole No.	Sample No.	Range (m)	Easting	Northing	Type	Туре
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:

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.

2





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

	Borehole ID: Depth (Lab ID)			
Test Type	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
	BH16-R003	
	BH16-R004	
	BH16-R006	
	BH16-C006	
	BH16-R005	
	BH17-C001	
0+000 m to 17+000 m	BH16-R007	Glaciofluvial Origin
	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
i i	BH18-BR15-1	
	BH18-BR15-2	
	BH16-R010	
	BH16-R012	
17+000 m to 25+000 m	BH16-R011	Mix of glaciofluvial and till/moraine
	BH16-C007	
	BH16-R013	
	BH17-C002	
	BH17-C003	
	BH16-R014	
	BH16-C008	
	BH17-C004	
	BH16-R015	
	BH16-R016	
25+000 m to 37+500 m	BH16-R017	Glaciofluvial
	BH16-R018	
	BH16-R019	
	BH16-R020	
	BH16-R021	
	BH16-C009	
	BH16-R022	
	BH16-R023	
	BH16-C010	
37+500 m to 40+000 m	BH16-R024	Mix of glaciofluvial and till/moraine
	BH16-R025	
	BH16-R026	
	BH16-R027	
	BH16-R028	
	BH16-R029	
	BH17-C005	
	BH16-R030	
40 + 000 to 54 + 000	BH16-C011	Clasiaflundal
40+000 m to 54+000 m	BH16-R032	Glaciofluvial
	BH16-C012	
	BH16-R033	
	BH16-R034	
	BH17-C006	
	BH16-R035	
	BH16-R036	
	BH16-R037	
	BH17-C006B	
	BH16-R038	
	BH16-R053	
	BH16-R039	
54+000 m to 58+000	BH16-R040	Glaciolacustrine
34+000 III (0 36+000	BH16-R041	Giaciolacustille
	BH16-R042	
Γ	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
The state of the s	SL17-D7	
	SL17-D5	
	SL17-D4	
	SL17-D3	
	SL17-D2	
	SL17-D1	
	BH18-BR70-1	
	BH18-BR70-2	
	BH17-C007	
	BH17-B001	
70+000 m to 75+000 m	BH17-B002	Glaciolacustrine
	BH17-C010	
	BH17-C011	
75+000 m to 77+000 m	BH17-C012	Mix of glaciolacustrine and
751000 III to 771000 III	BH17-C013	till/moraine deposits
	BH16-R067	
	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	
77,000 (400,000	BH16-C023	Object to the second
77+000 to 100+000 m	BH16-C024	Glaciolacustrine
	BH16-C025	
	BH16-C026	
	BH16-C027	
	BH16-C028	
	BH16-C029	
	BH17-BR86-1	
	BH17-BR86-2	
	BH17-BR86-3	
	BH16-C201	
	BH16-C202	
	BH16-C203	
	BH16-C030	
100+000 m to Terminus	BH16-B014	Mix of glaciofluvial and till/moraine
	BH16-B013	deposits
	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.





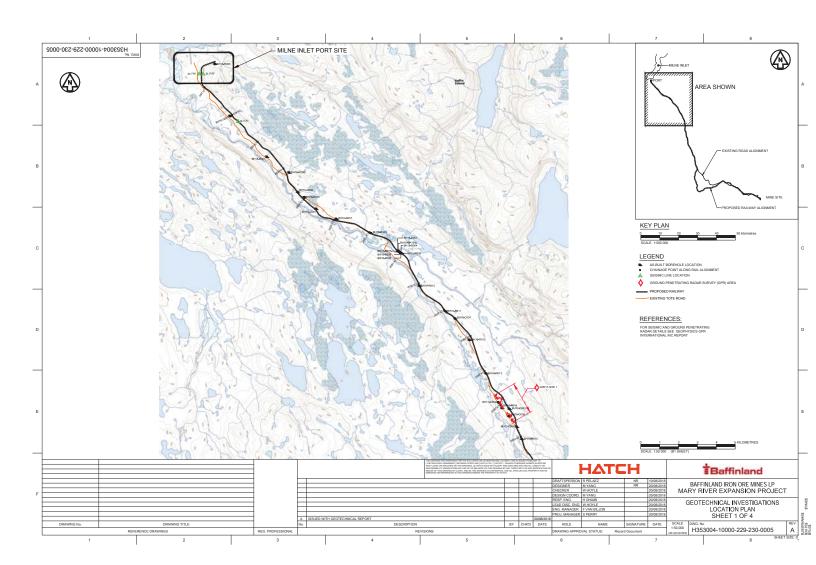
5. References

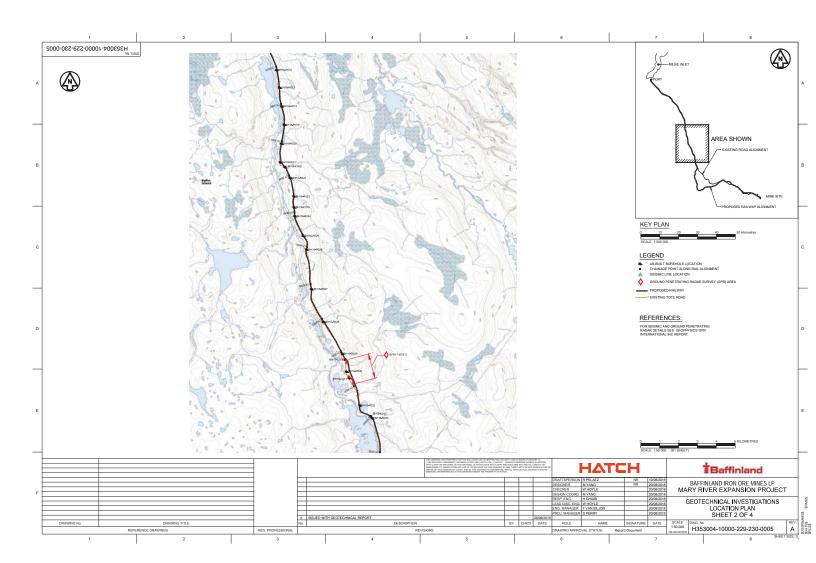
- 1. ASTM Standard Practice for Description of Frozen Soils (Visual-Manual Procedure) Designation D4083-89 *Approved June 1 2016.*
- Scott, D.J., de Kemp, E.A. 1998: Bedrock Geology Compilation, Northern Baffin Island and Northern Melville Peninsula, Northwest Territories, Geological Survey of Canada, Open File 3633, scale 1:500 000.
- Little, EC., Holme, P.J., and Kerr, D.E. 2013: Surficial Geology, Icebound Lakes (southwest), Baffin Island, Nunavut, Geological Survey of Canada, Canadian Geoscience Map 74 (preliminary), scale 1:100 000 doi:19.1985/292183.
- 4. Dyke, A.S. 2000: Surficial Geology, Phillips Creek, Baffin Island, Nunavut; Geological Survey of Canada, Map 1961A, scale 1:250 000.
- 5. AMEC Earth & Environmental, 2010: Geotechnical, Geochemical and Quarry Sourcing Investigation (Draft). Project No. TC101510. Dec. 2010.
- 6. Knight Piesold Consulting Ltd. (KP) report "Mine Site Infrastructure, Pit Overburden and Waste Dumps 2006 Site Investigation Summary Report", (Ref. No. NB102-00181/3-2), February 28, 2007.
- 7. Knight Piesold Consulting Ltd. (KP) report "Mine Site Infrastructure, Pit Overburden and Waste Dumps 2007 Site Investigations and Foundations Recommendations Summary Report", (Ref. No. NB102-00181/8-2), December 14, 2007.
- 8. Knight Piesold Consulting Ltd. (KP) boreholes (PMT-001, PMBC-002, PMPL-002, PMTF-001, PMSD-001 and BS-001) advanced at Milne Inlet in May 2007.
- 9. EBA Engineering Consultants Ltd. (EBA) memo "Foundation Recommendations, Mary River Mine Site Infrastructure", (File: E14101009.003), September 9, 2010.
- 10. Hatch Ltd. H337697-0000-15-124-0004. Geotechnical Data Report Infrastructure. April 5, 2012.
- 11. Hatch Ltd. H349000-1000-15-122-0001. Geotechnical Design Criteria. Aug 08, 2013.
- 12. Hatch Ltd. H352034-1000-220-068-0001, Site Assessment of North Railway Alignment Report, Oct. 3, 2017.
- 13. Jackson, G.D., Morgan, W.C. and Davidson, A., 1975: Geology Icebound Lake District of Franklin, Geological Survey of Canada Map 1451A, scale 1:250,000.
- 14. Blackadar, R.G. and Davison, W.L., 1968: Geology Phillips Creek District of Franklin, Baffin Island, Geological Survey of Canada Map 1239A, scale 1:253,440.

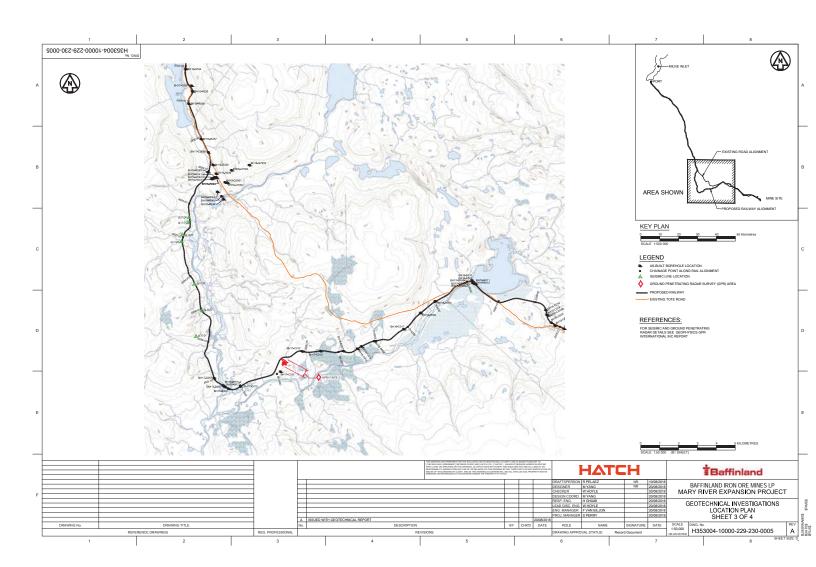


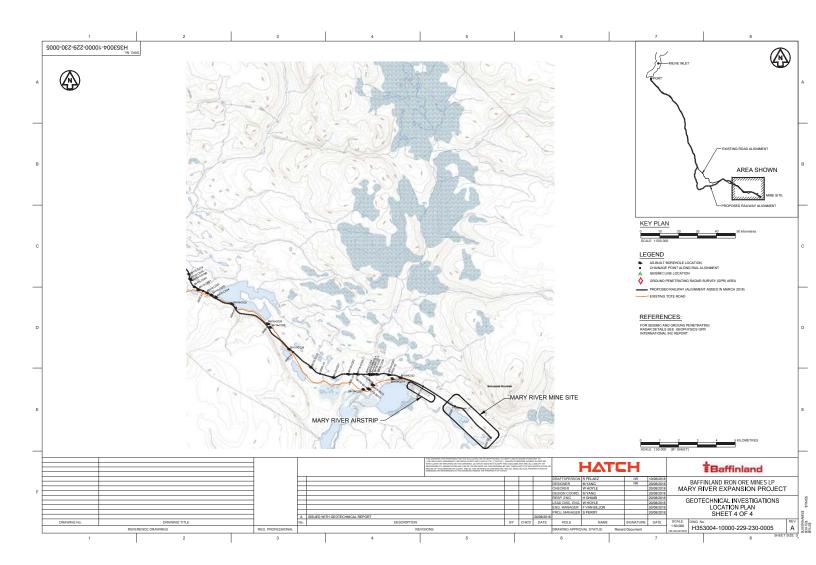


Appendix A Borehole Location Plan













Appendix B Borehole Reports

■ HATCH

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

 $\begin{array}{lll} A-Split \ \mbox{Tube} & E-Auger \\ B-Thin \ \mbox{Wall Tube} & F-Wash \end{array}$

 $\begin{array}{ll} {\sf C-Piston\ Sampler} & {\sf G-Shovel\ Grab\ Sample} \\ {\sf D-Core\ Barrel} & {\sf K-Slotted\ Sampler} \end{array}$

Shipping Container

O – Tube U – Not Recovered

P – Water Content Tin X – Plastic & PVC Sleeve (Sonic)

 $\begin{array}{ll} {\mathsf Q} - {\mathsf J}{\mathsf a}{\mathsf r} & {\mathsf Y} - {\mathsf C}{\mathsf o}{\mathsf r}{\mathsf e}\, {\mathsf B}{\mathsf o}{\mathsf x} \\ {\mathsf S} - {\mathsf P}{\mathsf l}{\mathsf a}{\mathsf s}{\mathsf t}{\mathsf c}\, {\mathsf B}{\mathsf a}{\mathsf g} & {\mathsf Z} - {\mathsf D}{\mathsf i}{\mathsf s}{\mathsf c}{\mathsf a}{\mathsf r}{\mathsf d}{\mathsf e}{\mathsf d} \end{array}$

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 claysHigh	compressibility silts	>50

Dilatancy

None
Slow
- No visible change, during shaking or squeezing
- 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)

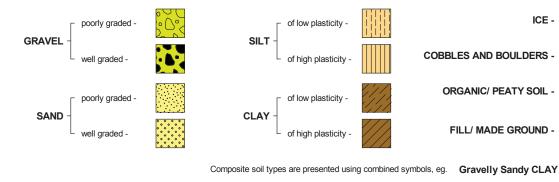
Rock

110011			T					
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.			Strength Term	Description Unconfined Compressive				
					Strength			
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.			Extremely weak rock	(MPa) (psi) Indented by thumbnail 0.25 – 1.0 36 – 145				
			Very weak	Crumbles under firm blows $1.0-5.0$ $145-725$ with point of geological hammer, can be peeled by a pocket knife				
RQD (%) Rock Quality 90 - 100 Excellent 75 - 90 Good 50 - 75 Fair 25 - 50 Poor 0 - 25 Very Poor			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		
Grain Size Term Very coarse-grained Coarse-grained Medium-grained Fine-grained	Grain Size		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		
Very fine-grained Bedding Term	2 μm - 00 μm < 2 μm		Strong rock	Specimen requires more than one blow of geological hammer to fracture it	50 – 100	7250 – 14500		
Very thickly bedded Thickly bedded Medium bedded Thinly bedded	>2 m >6 600 mm - 2 m 2.00 - 6 200 mm - 600 mm 0.65 - 2	6.50 ft 6.50 ft 2.00 ft 0.65 ft	Very strong rock	Specimen requires many blows of geological hammer to fracture it	100 – 250	14500 – 36250		
Very thinly bedded Laminated Thinly laminated	20 mm - 60 mm 0.06 - 0 6 mm - 20 mm 0.02 - 0	0.20 ft 0.06 ft 0.02 ft	Extremely strong rock	Specimen can only be chipped with geological hammer	>250	>36250		
Discontinuity Frequency Expressed as the number of discontinuities per meter or discontinuities per foot. Excludes drill-induced fractures and fragmented zones.			Weathering Term	Description				
			Fresh	No Visible sign of rock material weathering Discoloration on major discontinuity surfaces.				
			Faintly weathered					
Discontinuity Spacing Term Extremely widely spaced Very widely spaced Widely spaced	2 m - 6 m 6.50 - 20.00	0.00 ft 0.00 ft 6.50 ft	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 spaced Closely spaced Very closely spaced Extremely closely spaced	60 mm - 200 mm 0.20 - 0 20 mm - 60 mm 0.06 - 0	2.00 ft 0.65 ft 0.20 ft 0.06 ft	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.				
Note: Excludes drill-induce	d fractures and fragmented rock.		Highly weathered	More than half of the rock madisintegrated to a soil. Fresheither as a discontinuous fran	or discolored	rock is present		
Broken Zone Zone of full diameter core of very low RQD which may include some drill-induced fractures.			Completely weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.				
Fragmented Zone Zone where core is less than full diameter and RQD = 0.			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



GROUNDWATER OBSERVATIONS

Permanent Water Level	Ā	Inflow into Pit or Borehole	-	Slow Inflow/ Seepage into Pit or Borehole	~
Temporary Water Level	∇	Outflow/ Water Loss in			

Borehole

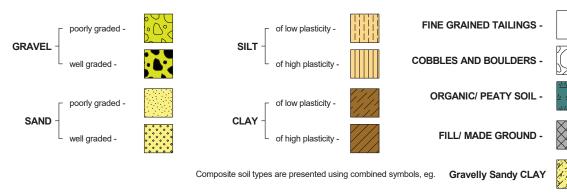
SAMPLE TYPES

Disturbed bag sample	Auger Flight Cuttings	Thin walled "undisturbed" push tube sample eg. U60, U100 etc	
Bulk Disturbed (>20kg)	Standard Penetration Test (SPT), with Disturbed Split-Spoon Sample		
Hollow Stem Auger Core	SPT (no recovery)	Sample attempted with no recovery	

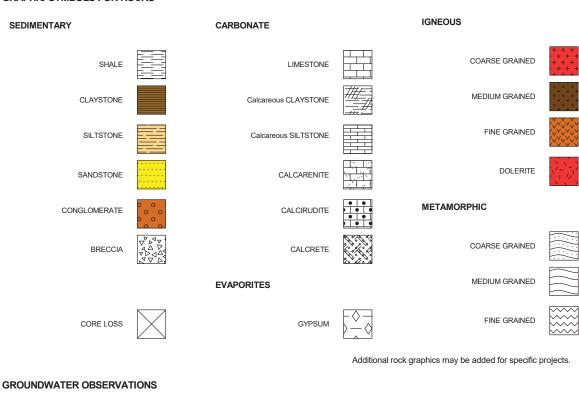
BASIS FOR ROCK DESCRIPTION

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

GRAPHIC SYMBOLS FOR SOILS



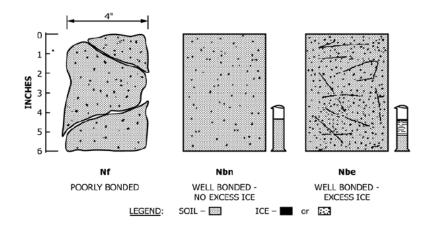
GRAPHIC SYMBOLS FOR ROCKS

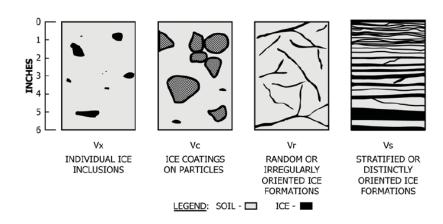


Slow Inflow/ Seepage into Pit Permanent Water Level Inflow into Pit or Borehole or Borehole ∇ Temporary Water Level Outflow/ Water Loss in **SAMPLE TYPES** Thin walled "undisturbed" push tube sample eg. U60, U100 etc Disturbed bag sample Auger Flight Cuttings Standard Penetration Test Bulk Disturbed (>20kg) (SPT), with Disturbed Split-Spoon Sample Sample attempted with no Hollow Stem Auger Core SPT (no recovery) 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





Rev 0 Page 1 of 1

Contractor: Boart Longyear

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11:24

Notes:

BOREHOLE REPORT

BH16-B001

Easting:

Surface Elevation:

Sheet 1 of 2

514,191.0 m

78.00 m

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 12/3/2016

Northing: 7,965,675.0 m

Bottom Elevation: 66.50 m

Total Depth: 11.5 m Logged By: MR

ľ	Ontract	. 01. D0	art L	Jong	ycui	rig type/ mounting. Willingonic rig	Date L	vys	jeu	•	12/3/2010	-	.ogg	eu Dy	•			MR
D	riller:	Mi	chae	l Sc	ott	Hole Diameter (mm): 96	Date F	levi	ewe	ed:	:2/10/2017	F	Revie	wed	Ву:			SH/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	0	Moisture Content Profile 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Г	_	_			<u> </u>	SILT: Organic, fine grained	Vx			Ť		T						
	77.0	- - 1.0-				ICE LENSE, silt inclusions: Grey to dark grey, soft, cloudy texture	ICE		∇									- - - -
ved due to permafrost		- - - 2.0-				SILTY SAND, trace GRAVEL, trace COBBLES: Grey to light brown, fine to coarse grained sand, subangular to rounded cobbles	Vc											- - - - - -
Unobserved due	- - -75.0 - -	3.0-					Nbe	,	\square		•	g 1!		66	29			- - - - - -
		4.0-					Nbn											- - - - -
	-73.0 - - - - - -72.0	5.0- - - - - 6.0-	Vibracore	H-Casing		DOLLI DEDO O CONTRA SERVICIO DE LA CONTRA SERVICIO DELIGIO DE LA CONTRA SERVICIO DE LA C	Me		✓									+ - - - -
	- - - -71.0	7.0-				BOULDERS: Grey, granitic gneiss and mafic gneiss with pulvurized powder	Nf		<u> </u>									- - - - -
	- - 70.0	8.0-				Sandy SILT, trace COBBLES, trace BOULDERS: Reddish brown, rounded to subrounded cobbles	Nf											 - - - -
בובייייייייייייייייייייייייייייייייייי	- - -69.0 - -	9.0-																 - - - - -
=	68.0	10.0		<u> </u>								<u></u>		_	<u> </u>			

BOREHOLE REPORT

BH16-B001

Easting:

Northing:

Surface Elevation:

Sheet 2 of 2

514,191.0 m

7,965,675.0 m

78.00 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Location: Proposed Rail Alignment

Platform: Ground

Datum:

Bottom Elevation: 66.50 m

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Total Depth: 11.5 m Logged By: MR

Date Logged: 12/3/2016

Dril	ler:	Mic	chae	l Sc	ott	Hole Diameter (mm): 96	Date I	Rev	iew	ed:2/1	10/2017		Re	view	/ed E	Зу:			SH/WH
Water	Elevation (m)	Depth (m)	Method	Casing		Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Co	Moisture ontent Profile	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			\searrow										
	- 66.0 - -	- 12.0- - - -				Drilling Refusal. Drillhole BH16-B001 terminated at 11.5m.			\searrow										
	65.0 64.0	13.0—																	
	- - 63.0 -	_ _ _ 15.0— _ _																	
	- 62.0 - -	16.0— — — —																	
	61.0 60.0	17.0— — — — — — — — — — — — — — — — — — —																	
	- - 59.0	- - 19.0- -																	
Note	- - - _{58.0}	20.0																	

Contractor: Boart Longyear

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11:24

Notes:

BOREHOLE REPORT

BH16-B002

Sheet 1 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 12/2/2016

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

"	milaci	51. DO	u	.0119	you	rag Type/ Mounting. Willingonic rag	Dato L	- ye	,00		12/2/2010	-	-aa.	u by				UK
Dr	iller:	E.E	3eac	han	пр	Hole Diameter (mm): 96	Date F	levi	ew	/ed	d:2/10/2017	R	evie	wed	Ву:			SH/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	0	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
permafrost	- - - - -77.0	- - - 1.0-				SAND: Dark brown to grey, some organics	Nf		V	1								-
Unobserved due to perm		_ 2.0— _ _ _				SANDY GRAVEL, some COBBLES: Grey to brown, coarse grained sand, angular gravel	Nf					11						-
	75.0 74.0	3.0— — — — 4.0—			<u> </u>	SAND, some COBBLES, some BOULDERS: Grey, fine grained sand, rounded to subrounded cobbles and boulders	Nf											
	- - 73.0 - -	5.0— - - - -				SILTY SAND, some COBBLES, trace GRAVEL: Grey, fine grained sand	Nbn	•	\searrow			14	5	77	19			
	72.0 71.0	6.0— — — — 7.0—	Vibracore	H-Casing		SAND, some SILT, trace GRAVEL: Grey	Nf		X			14			19			-
	_ _ 	8.0—				BOULDERS: Granitic, fragmented SANDY SILT: Grey, fine grained BOULDERS: Granitic gneiss, rock			V									-
		9.0— - - - - 10.0—				fragments and boulders SILTY SAND, some COBBLES, some BOULDERS: Dark grey, fine to coarse grained sand, rounded to subrounded cobbles	Nf											

BOREHOLE REPORT

BH16-B002

Sheet 2 of 2

Client: **Baffinland Iron Mines**

Project No.: H352034

Easting: 514,290.0 m Northing: 7,965,604.0 m

Bottom Elevation:

Project: Mary River Expansion Study Stage 2

NAD83

Surface Elevation: 78.00 m

Location: Proposed Rail Alignment

Platform: Ground

Datum:

64.90 m

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 12/2/2016

Total Depth: 13.1 m Logged By: UK

Driller: E.Beachamp Hole Diameter (mm): 96 Date Reviewed: 2/10/2017 Reviewed By: SH/WH Soil Description

	Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	(size, grading, shape, roundness), colour, structure, accessory components.		Recovery	Sample Type	Moisture Content Profile	100	Field Water Conten	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 (Continue	d)										
		- - - - - 66.0	- - - 12.0-							∇									-
		- - - - 65.0			[13.1]		SILT, some SAND, trace GRAVEL: Light brown to grey, granular to cohesive, fine to medium grained sand, subangular to angular gravel	Nf		∇									-
11:24		- - - - 64.0	- - - 14.0-				Drilling Refusal. Drillhole BH16-B002 terminated at 13.1m.					-							-
ingFile>> 13/09/2017		- - - - 63.0	- - - 15.0-																-
REV 3.GPJ < <draw< td=""><td></td><td>- - - - 62.0</td><td>- - - 16.0-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td></draw<>		- - - - 62.0	- - - 16.0-																-
T ALL_WITH ICE LOG		- - - - 61.0	- - - 17.0-																-
LE RAIL ALIGNMEN		- - - - 60.0	- - - 18.0-																-
B Log ICE BOREHO		- - - - - -59.0	- - - 19.0-																-
BAFFINIAND GINT LIBRARY GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <drawingfile>> 13/09/2017 11:24</drawingfile>		- - - - - -58.0	- - - 20.0-																-
BAFFINLAN	Note	es:																	

BOREHOLE REPORT

BH16-B003

Easting:

Northing:

Surface Elevation:

Sheet 1 of 2

514,357.0 m

7,965,533.0 m

79.00 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Location:

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

Notes:

Proposed Rail Alignment

Bottom Elevation: 63.80 m

Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig Platform: Ground

Total Depth: 15.2 m

Date Logged: 12/2/2016

Datum:

Logged By: MR

Dr	iller:	Mie	chae	l Sc	ott	Hole Diameter (mm): 96	Date R	eviev	wed: 2/10/2017	Re	view	ved E	Ву:			SH/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
afrost		- - - 1.0-				SILTY SAND, with GRAVEL, trace COBBLES: Dark brown to dark grey, Organics, fine to coarse grained sand, subangular gravel	Vc	₩								- - - -
Unobserved due to permafrost		2.0-				GRAVEL, with SAND, some COBBLES, trace SILT: Grey to light brown, fine to coarse grained sand, rounded to subrounded cobbles	Vc	\ <u>\</u>		9	24	47	28			- - - - - -
7.	76.0 	3.0-			01	SILTY SAND and GRAVEL: Grey, fine to coarse grained	Nbn									+ - - -
	75.0 	4.0-				SAND: Grey, fine to coarse grained sand ICE, silt inclusions: Brown to grey, milky texture	Vr	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \								
	74.0 	5.0— — — — — 6.0—				texture		~	z	100	2	72	26			-
	_ _ _ 	- - - - 7.0-					Vr									- - - -
		8.0—	Vibracore	H-Casing		SAND, some SILT, trace COBBLES: Reddish brown, rounded to subrounded cobbles	Nf	\$\frac{1}{2}		23						- - - - - - -
ייי פויין בוניאלייילדנ	-70.0 - - - - - - - - - -	9.0-				SILTY SAND: Grey to brown, fine to coarse grained sand, rounded cobbles		∑Z								- - - - - -

Contractor: Boart Longyear

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11:24

BOREHOLE REPORT

BH16-B003

Sheet 2 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 12/2/2016

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

				·		3 . // por 33 .			_			,5	,				IVIIX
	Driller:	Mi	chae	el Sc	ott	Hole Diameter (mm): 96	Date I	Rev	iew	ved:2/10/2017	Rev	/iew	ed E	Зу:			SH/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
	- - - -68.0 - - - - - - - - - - - - - - - - - - -	11.0-				BOULDERS: Granitic gneiss SILTY SAND, some GRAVEL, some COBBLES: Reddish brown, fine grained sand, angular to subangular gravel	Nf										-
dwiligi liez - 2,000,000 - 2,000	- - -65.0 - - - - - 64.0	- - 14.0- - - - - 15.0-		[15.2]					M								-
L_WITH ICE LOG_NEV 3.613 V.D.	- - 63.0 - -	16.0-	-			Drilling Refusal. Drillhole BH16-B003 terminated at 15.2m.											-
ICE BOREHOLE RAIL ALIGNIMEN I AL	62.0 61.0 	17.0- - - - - 18.0- -															-
AND GINT LIBRARY.GLB LOG		19.0-	-														-

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

Easting:

Sheet 1 of 2

514,367.0 m

79.00 m

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Northing: 7,965,540.0 m Surface Elevation:

Bottom Elevation: 62.80 m

Total Depth: 16.2 m Logged By: UK

	Con	tracto	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ed	: 12/1/2016		1		лери d By				16.2 m UK	
	Drill	er:	E.I	Bead	chan	np	Hole Diameter (mm): 96	Date R	levie	ewe	ed:2/10/2017		Re	viev	ved E	Зу:			SH/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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
		-78.0	- - - 1.0-				SAND: Grey, coarse grained sand 0.60 m to 1.50 m: SILT, dark grey to dark brown	Nf Nbn												
	Unobserved due to permafrost	-77.0 -76.0	- 2.0- - - - - - 3.0-				SILTY SAND, some GRAVEL: Grey, angular to subangular gravel,	Nf	2	\square	• 		9							
13/08/2017 11.24	-	-75.0	4.0-						<u> </u>											
V 5.GP 5 Diawingi IIC -	- - - -	-74.0	5.0— - - -				ICE, SILT inclusions: Moderate hardness, greyish color, cloudy texture	ICE				>>•	100	7	54	39				- - - - -
	-	-73.0	6.0-				Sand and SILT, trace GRAVEL: Grey, fine to coarse grained sand BOULDERS: Granitic gneiss	Vr					100	·	04					-
ייי ייים ייים אוייים אויים	-	-72.0	7.0- - - -	ē	gr.		SAND: Grey, fine to coarse grained	Nbn	2	Z			19	35	44	21				-
- 09 IOE BONEHOLE I	-	-71.0	8.0— - - -	Vibracore	H-Casing		SAND: Grey, fine to coarse grained	Nbn Nf												-
י איזטיייייאמוז ואוט	- - - -	-70.0	9.0-				SILTY SAND: Grey to brown, fine to coarse grained	Nf												-
1	Notes	-69.0 S:	10.0										1		<u> </u>	<u> </u>	<u> </u>			+

Location:

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11:24

Notes:

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-B004

Sheet 2 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Proposed Rail Alignment

NAD83

Platform: Ground

Date Logged: 12/1/2016

Datum:

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

١٠	ontract	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	.ogg	jea	: 12/1/2016		Log	gea	I By:				UK
D	riller:	E.I	Bead	chan	пр	Hole Diameter (mm): 96	Date F	Revi	ew	ed:2/10/2017		Rev	iew	ed E	By:			SH/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	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	- - - 68.0	- - - 11.0- - -				ROCK: Granitic gneiss, intact, moderate to high strength SILTY SAND, some GRAVEL, trace COBBLES: Brown to reddish brown, fine to coarse grained sand, rounded to subrounded cobbles	Nf		\checkmark									-
		12.0- - - - - 13.0-					Vx		V									- - - - -
	- - - - - - 65.0	- - - 14.0- - -				SAND and SILT, trace COBBLES: Grey to dark grey, fine to medium grained sand, rounded to subrounded cobbles	Vc		\vee									- - - - - - -
		15.0= - - - - - 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	X.	~									-
	- - -62.0	- - 17.0- - -				Drilling Refusal. Drillhole BH16-B004 terminated at 16.2m.												- - - - -
2		18.0- - - - - 19.0-																- - - - - -
	59.0	- 20.0-																-

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

Notes:

BOREHOLE REPORT

BH16-B009

Sheet 1 of 3

115.60 m

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground Easting: 542,204.0 m Northing: 7,922,291.0 m

Surface Elevation: 143.00 m

Total Depth: 27.4 m

Bottom Elevation:

Contrac	tor: Bo	art L	.ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ged	: 11/7/2016	l .	gge					RS/CS
Driller:	E.E	3eac	ham	пр	Hole Diameter (mm): 96	Date R	levi	ew	ed:2/10/2017		view					SH/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
141.0 142.		Vibracore	H-Casing (SAND: Poorly graded, brown, fine to medium grained 1.50 m to 4.00 m: Trace SILT	Nf	E E E E E E E E E E E E E E E E E E E	× × × × × × × × × × × × × × × × × × ×		22	0	98	2			

BAFFINI AND GINT LIBRARY GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ </br>

BOREHOLE REPORT

BH16-B009

Sheet 2 of 3

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment 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

	Contra	cto	r: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date Logged:	11/7/2016	Logge	d By:		RS/CS
L	Driller:	:	E.E	Bead	chan	пр	Hole Diameter (mm): 96	Date Reviewe	d :2/10/2017	Review	ed By:		SH/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.	Recovery Sample Type	Moisture Content Profile	Field Water Content Percent Gravel	Percent Sand Percent Fines	Liquid Limit Plastic Index	Other Tests
47.11.124	- 132 131 131 136 125	0.00	11.0-				SAND: Poorly graded, brown, fine to medium grained (Continued)	Nf (Continued)					- - - - - - - - - - - - - - - - - - -
HICE LOG NEW 3.GT3 AND AWINGTIEN 19/08	- - -128 - - - - - -127		15.0— ———————————————————————————————————										
BONETIOLE PAIL ALIGINIMENT ALL_VIIII	- - - - - - - - - 125		17.0— 17.0— 18.0—				SAND and GRAVEL: Rounded to subrounded gravel, fine grained sand	Nbn					
III		4.0	19.0—		[18.8]								

BOREHOLE REPORT

BH16-B009

Sheet 3 of 3

115.60 m

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

NAD83

Platform: Ground

Datum:

Easting: 542,204.0 m Northing: 7,922,291.0 m

Surface Elevation: 143.00 m

Total Depth: 27.4 m

Bottom Elevation:

Cont	racto	or: Bo	art I	ong	ıyear	Rig Type/ Mounting: MiniSonic Rig	Date L	.ogg	ged	d:	11/7/2016		otai i	-				RS/CS	
Drille	er:	E.I	Bead	chan	np	Hole Diameter (mm): 96					! :2/10/2017		eviev					SH/WH	
	Elevation (m)	Depth (m)	Method	Casing	Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil		Sample Type		Moisture Content Profile	Water Content		Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
	122.0 121.0 121.0 119.0	21.0—				SAND: Grey with Brown seams, fine to medium grained sand	Nbn (Continue	ed)											
 -	-115.0	28.0-				To Target Depth. Drillhole BH16-B009 terminated at 27.4m.													+
	113.0	30.0																	_

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

Notes:

Project:

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

Notes:

BOREHOLE REPORT

BH16-B010

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

> Mary River Expansion Study Stage 2 Datum: NAD83

Location: Proposed Rail Alignment

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:

	Con	tracto	or: Bo	art L	.ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ged	l: 11	/8/2016				d By:				CS	
	Drill	ler:	E.I	Bead	cham	пр	Hole Diameter (mm): 96	Date R	levi	ew	ed:2/	10/2017		Re	viev	ved E	Зу:			SH/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	Co	Moisture ontent Profile 50	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
	Unobserved due to permafrost						SAND, trace SILT, trace GRAVEL: Reddish brown, medium to fine grained sand	Nf	,	X											
	Unobserv		3.0- - - - - - 4.0-							\times				11	5	87	8				
12/20/20/21		-138.0	5.0—	Vibracore	H-Casing		4.20 m: Slight increase in silt content	Nbn		\times				21	0	98	2				
2000		—137.0 ·	6.0— — — —					Nf	,	X											-
COMMENT OFF		—136.0 —135.0	7.0- - - - 8.0-				SILTY SAND: Reddish brown to grey, fine to course grained sand	Nbn													
במל וכב בכובייכיבי יגייני			9.0- - -					Nbn	,	X				20	0	61	39				
- CIN CID		—133.0—	10.0 		[10.0]		To Target Depth. Drillhole BH16-B010 terminated at 10.0m.														-

BOREHOLE REPORT

BH16-B011

Easting:

Northing:

Total Depth:

Sheet 1 of 2

542,365.0 m

7,922,121.0 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Location:

Proposed Rail Alignment

Platform:

Datum:

Surface Elevation: 144.00 m **Bottom Elevation:** 133.30 m

Ground

10.7 m

С	ontr	acto	r: Bo	art L	.ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ged	: 11/8/2016			d By				RS	
D	rille	r:	Sa	mue	l Fly	nn	Hole Diameter (mm): 96	Date R	evi	ewe	ed:2/10/2017	Re	eviev	ved E	Зу:			SH/WH	
Water	Total Care	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 permatrost	50	42.0 41.0 40.0 338.0 338.0		Vibracore	H-Casing		SAND, trace SILT, trace GRAVEL: Light brown, fine to coarse grained sand	Nbn Nbn		\times		19	0	98	2				

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

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-B011

Sheet 2 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 11/8/2016

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

Drill	ler:	Sa	mue	l Fly	nn	Hole Diameter (mm): 96	Date I	Revi	iew	ed:2/10	/2017		_	view	ed E	Зу:			SH/WF
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	Con	Moisture tent Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Tests
-		-		[10.7]		SAND, trace SILT, trace GRAVEL: Light brown, fine to coarse grained sand (Continued)	Nf (Continue												
-	 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-																	
		- -																	
lotes	_ _{124.0} S:	20.0				<u> </u>	<u> </u>						<u> </u>			<u> </u>			

Location:

BOREHOLE REPORT

BH16-B012

542,376.0 m

7,922,131.0 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project: Mary River Expansion Study Stage 2 Proposed Rail Alignment

Platform:

Datum:

NAD83 Ground

136.90 m **Total Depth:**

Logged By:

Surface Elevation:

Bottom Elevation:

Easting:

Northing:

9.1 m

146.00 m

Date Logged: 11/8/2016 Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig RS

Dri	ller:	Sa	mue	l Fly	'nn	Hole Diameter (mm): 96	Date F	Revi	ew	ed:2/10/2017		Re	view	ved E	Зу:			SH/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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	- - -	-				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	- - -	-			. () .	SAND and GRAVEL: Brown, rounded to subrounded gravel, up to 30mm	Nf											
Stand	143.0 	3.0-				SITLY SAND, trace GRAVEL: Grey and brown layers	Nbn		X	9		12	4	87	9			
	- 142.0 -	4.0 -	ore	Bu														
	_ _ _ 141.0	- - 5.0-	Vibracore	H-Casing														
	- - -	-																
	140.0 	6.0-																
	- 139.0 	7.0-																
	_ _ _ 138.0	- - 8.0-																
	- - -	- - -							X									
	137.0	9.0-		[9.1]					Ц									
	- - -	- - -				To Target Depth. Drillhole BH16-B012 terminated at 9.1m.												
Note	136.0	10.0-																
NOTE	es.																	

BOREHOLE REPORT

BH16-B013

Easting:

Northing:

Total Depth:

Surface Elevation:

Bottom Elevation:

Sheet 1 of 2

555,619.0 m

7,914,671.0 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Location:

Proposed Rail Alignment

Platform: Ground

Datum:

154.80 m 144.20 m

10.6 m

Oril		L.I		cham		Hole Diameter (mm): 96	1	1		ed:2/10/2017				ved I	_ <u>, </u>	T		SH/W
vvalei	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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Oth Tes
d due to permanost	- - - - - - - - - - - - - - -	1.0-				SAND and GRAVEL, some COBBLES: Brown, fine to coarse grained sand, angular gravel 1.20 m to 3.00 m: Trace to some silt and cobbles	Nf Nf		X									
new lescono	- - - - - - - - - -	3.0-				SILTY SAND, some GRAVEL: Grey, angular gravel SAND and SILT: Inferred COBBLES or	Nf		\times			12	0	53	47			
-	- - - - 149.8 - -	- - 5.0- - -	Vibracore	H-Casing		BOULDERS: Brown, white powder												
-	148.8 	6.0- - - - - - 7.0-				INFERRED SANDSTONE: Angular pieces of rock, low to moderate strength			\times									
-		- 8.0- - - - - 9.0-				INFERDED CANDOTONE REPROCE			\boxtimes									
	- - - - - 144.8	10.0				INFERRED SANDSTONE BEDROCK												

BOREHOLE REPORT

BH16-B013

Easting:

Northing:

Logged By:

Sheet 2 of 2

555,619.0 m

7,914,671.0 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Surface Elevation: 154.80 m

Location:

Proposed Rail Alignment

Platform: Ground **Bottom Elevation:** 144.20 m **Total Depth:** 10.6 m

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 11/13/2016

Datum:

RS/CS

Driller: E.Beachamp Hole Diameter (mm): 96 Date Reviewed: 2/10/2017 Reviewed By: SH/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	Mois Content	ture Profile 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)			X										
		- 143.8 	11.0-				To Target Depth. Drillhole BH16-B013 terminated at 10.6m.						·							-
	-	- - 142.8 -	12.0-																	-
	-	- - - 141.8	13.0-																	-
17 11:24	-	- - - 140.8	14.0-									 								-
vingFile>> 13/09/20	-	- - - 139.8	15.0-																	-
REV 3.GPJ < <draw< td=""><td>-</td><td>- - - - -138.8</td><td>- 16.0-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td></draw<>	-	- - - - -138.8	- 16.0-																	-
L_WITH ICE LOG_	-	- - -	- - -																	- - -
AIL ALIGNMENT AL	- - - -	137.8 	17.0-																	- - -
CE BOREHOLE R			18.0-																	-
D GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ < <drawingfile>> 13/09/2017 11:24</drawingfile>	-	- 135.8 	19.0- -																	-
D GINT LI		-	20.0-									 <u> </u>								

BAFFINLAND Notes:

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-B014

Sheet 1 of 1

555,599.0 m

7,914,683.0 m

156.00 m

146.90 m

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: **Date Logged:** 10/28/2016

Ground

Total Depth:

Easting:

Northing:

Surface Elevation:

Bottom Elevation:

9.1 m Logged By: MR

				·	,	5 3.		-					55	•				IVIIX	
Dr	iller:	Sa	mue	l Fly	nn -	Hole Diameter (mm): 96	Date R	evie	we	ed:2/10/2017	\downarrow		view	ved E	Зу:			SH/WH	4
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	00	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
Unobserved due to Permafrost		3.0- - - - - - - - - - - - - - - - - - -	Vibracore	H-Casing C:		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 SAND, with GRAVEL, trace COBBLES: Grey, fine to coarse grained sand, angular to subrounded gravel 4.60 m to 7.0 m: Trace to some silt	Nf Nf	21 21				12	0	65	35	רג	id		
				[9.1]		SAND with GRAVEL, trace COBBLES: Light grey, white powder, trace cobbles, fine to coarse grained sand, angular gravel 7.90 m: Inferred sandstone bedrock, weak to moderate strength			Z			1	0	63	37				
	- - - - 146.0	- 10.0-		41		To Target Depth. Drillhole BH16-B014 terminated at 9.1m.													-

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

BOREHOLE REPORT

BH16-B015

555,824.0 m

7,914,884.0 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Datum:

Platform:

Project:

Location:

Mary River Expansion Study Stage 2

Proposed Rail Alignment

NAD83

Ground

Total Depth:

Easting:

Northing:

Surface Elevation:

Bottom Elevation:

142.40 m 13.6 m

156.00 m

	(m) r	<u></u>			Log	Soil Description				Moisture			Content	le/	70	s			
water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Content Profile		100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Tes
Unobserved due to permatrost	- - - - - - - - - - - - - - - - -	- - 1.0- - - - - 2.0-				SILTY SAND, with GRAVEL, with COBBLES: Brown, fine to coarse grained sand, angular to rounded gravel and cobbles, well graded	Nf		X		>>>	•	100	17	41	41			
aon Turan	- —153.0 - — 153.0 - — —152.0	3.0- - - - - 4.0- -							X										
	- 	5.0- - - - - 6.0- -		bu		6.10 m to 7.60 m: Ice rich soil	Vx		\times				11	0	63	37			
	- 	7.0- - - - - 8.0-	Vibracore	H-Casing					X										
	- - - 147.0 - -	9.0-				9.70 m to 10.6 m: Ice rich soil	Vr												

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-B015

Sheet 2 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 11/14/2016

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

	riller:	Mic	chae	l Sc	ott	Hole Diameter (mm): 96	Date R	evi	ew	ed:2/10/2017	R	evie	wed	Ву:			SH/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
	- - - - -145.0	- - - 11.0-				SANDSTONE: Pulverized sandstone bedrock with some intact sandstone core, grey to white	Nf (Continue	ed)	\times		100	15	66	20			-
	- - - 144.0 -	12.0-				INFERRED SANDSTONE BEDROCK: bedrock, moderate strength, good			X								- - - - -
	- - -143.0 - -	13.0-		[13.6]		quality To Target Depth.			X								-
	- 142.0 - - - -	14.0-				Drillhole BH16-B015 terminated at 13.6m.											- - - - -
	141.0 	15.0-															† - - - -
	- - - - -139.0	17.0-															- - - -
	- - -138.0 -	18.0-															- - - -
	137.0 	19.0-															-
<u> </u>	136.0	20.0															

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11:24 Notes:

BOREHOLE REPORT

BH16-B016

Sheet 1 of 1

555,830.0 m

Easting: Client: **Baffinland Iron Mines** Project No.: H352034

Northing: 7,914,892.0 m Project: Mary River Expansion Study Stage 2 Datum: Surface Elevation: 153.00 m NAD83

Bottom Elevation: 145.40 m Location: Proposed Rail Alignment Platform: Ground **Total Depth:** 7.6 m

Date Logged: 11/16/2016 Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig Logged By: MR

Dril	ler:	Sa	mue	l Fly	'nn	Hole Diameter (mm): 96	Date F	Revi	iew	ed:2/10/2017		Re	view	ed E	Ву:			SH/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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	- - - -152.0 - - - -	1.0				GRAVEL and SAND, some SILT, trace COBBLES: Light brown to brown, fine to coarse grained sand, rounded to subangular gravel	Nf		×									
Unobserv	- - 150.0 - - - - 149.0	- 3.0- - - - - 4.0-	Vibracore	H-Casing	, C	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			
-	- - 148.0 - -	5.0—					Nf		✓				0	67	33			
-	- 147.0 - - - - - - 146.0	6.0— — — — — —				5.80 m to 6.10 m: Ice lense SAND, some GRAVEL, some COBBLES: Light brown to grey	ICE Vx											
	-	-		[7.6]	000	To Target Depth.			M	•		7	0	66	34			
- - - -	- 145.0 - - - - - 144.0	8.0— — — — — 9.0—				Drillhole BH16-B016 terminated at 7.6m.												
Note	- - - - - 143.0	10.0								 								

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-C006

Sheet 1 of 1

69.65 m

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 12/3/2016

Easting: 508,897.0 m Northing: 7,968,767.0 m

Surface Elevation: 71.75 m

Total Depth: 2.1 m

Bottom Elevation:

Logged By: UK

	COIL	iacio	JI. DO	art	.orig	ycai	rag Type/ mounting. Willingonic rag	Date	.og	gec	4.	12/3/2010		LU	yye	л Бу	•			UK
	Drille	er:	E.E	Bead	ham	пр	Hole Diameter (mm): 96	Date F	Rev	iew	/ed	1:2/10/2017		Re	view	ed E	Зу:			SH/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	0	Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	to permafrost	70.8 69.8	1.0-	Vibracore	H-Casing		SAND, some SILT: Dark brown, organic, medium to coarse grained sand SILTY SAND, with COBBLES, : Grey to white, pulverized rock and angular rock pieces INFERRED BEDROCK: Granitic gneiss	Nf Nf												-
11:24	- - - -	68.8	3.0-				Drilling Refusal. Drillhole BH16-C006 terminated at 2.1m.													-
LEV 5.GF3 SEDIAMIIGNIESS 15/09/201	-	66.8	5.0-																	-
OLE PAIL ALIGINIEN I ALL WITH I CE LO	- - -	64.8	7.0-																	-
D GIN I LIBRARY GLB LOG ICE BOREHOLE	- - - - - - -	62.8	9.0-																	_

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

Notes:

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-C007

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 12/1/2016

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

<u></u>	Method	Casing	Graphic Log	Hole Diameter (mm): 96 Soil Description					d:2/10/2017		_	eviev		- y .			SH/W
Depth (m)	Method	sing	ic Log	Son Description		1	. 1										
-		ပိ	Graph	TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	0	Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Tes
				SILTY SAND, trace GRAVEL, trace COBBLES: Light brown, fine to medium grained sand, rounded to subangular	Nf												
-				gravel													
1.0-							V				17						
-					Vc												
2.0-																	
-							V										
3.0-					Vx												
-	racore	Casing					abla				12	1	73	26			
4.0-	Ş	Ŧ															
- -					Nbn												
5.0-				4.60 m to 4.80 m: Ice lense	ICE		abla										
-																	
6.0-				6.10 m to 7.60 m: Ice rich silty sand	Vx												
-				·													
7.0-																	
-		[7.6]		To Target Denth			\square				39						
8.0-				Drillhole BH16-C007 terminated at 7.6m.													
-	-																
9.0-																	
- -																	
10.0	_																
	3.0- - - - - - - - - - - - - - - - - - -		3.0- 		4.60 m to 4.80 m: Ice lense 6.10 m to 7.60 m: Ice rich silty sand To Target Depth. Drillhole BH16-C007 terminated at 7.6m.	Nbn	Nbn	Double D	Double of the second of the se	Vx	100	12 12 12 12 13 14 15 15 15 15 15 15 15	Nbn	300- 300-	300- 200 More of the second of	20- Double Double Double Double Double Double Drillhole BH16-C007 terminated at 7.6m.	Nbn

BOREHOLE REPORT

BH16-C008

Easting:

Sheet 1 of 2

520,080.0 m

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Northing: 7,956,909.0 m Surface Elevation: 119.30 m

Bottom Elevation: 105.60 m

Total Depth: 13.7 m

Dri		Mi				Hole Diameter (mm): 96	1	T		ed:2/10/2017			eviev		_	Т		SH/W
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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Test
mafrost		- - - 1.0-				GRAVELLY SAND, some COBBLES and SILT: Light brown to grey, fine to coarse grained sand, rounded to subangular gravel	Nf		₩ ₩			13						
Unobserved due to permafrost	- - - -	2.0-					Vx		\square			20						
Unc	116.3 	3.0-			000	ICE: Grey to white color, weak to moderate strength, cloudy texture, minor silt inclusions	ICE											
	- 115.3 - -	4.0- - -																
		5.0- - -																
	- 113.3 - -	6.0- - -	e	Di Di														
		- 7.0- -	Vibracore	H-Casing														
	- 111.3 -	8.0-																
	- 110.3 - -	9.0-																
	109.3	10.0																

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-C008

Sheet 2 of 2

520,080.0 m

7,956,909.0 m

119.30 m

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 11/30/2016

Bottom Elevation: 105.60 m

Easting:

Northing:

Surface Elevation:

Total Depth: 13.7 m

Logged By: MR

	Contra	ictor:	ooan	LONG	year	Rig Type/ Mounting: MiniSonic Rig	Date	Log	yec	ı.	11/30/2016	LC	ogge	a By				MR	
	Driller	:	Micha	ael So	cott	Hole Diameter (mm): 96	Date	Rev	iew	ed	1:2/10/2017	Re	eviev	ved I	Зу:			SH/WH	
	Water Flevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soi Description	Recovery	Sample Type	0	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
	- - - - - - - - -	7.3 12		[13.7		ICE: Grey to white color, weak to moderate strength, cloudy texture, minor silt inclusions (Continued)	ICE (Continu												
1677 10103/2017 11.24	- 10. - - -	5.3 14				To Target Depth. Drillhole BH16-C008 terminated at 13.7m.													-
EV 5.GFJ >>DIAWIIIgn	- - -		5.0-															-	-
ALL_WITH IOE LOG_R	- - -																	-	
E NAIL ALIGINIMEIN I	- - -		'.0- - - -															-	
LOG TOE BOREHOLE			-															-	-
JIN I LIBRAN I GLB	10 - - -	0.3 19	0.0— — — —																-
L		3 20					1	\perp	ш										Ŧ

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

BOREHOLE REPORT

BH16-C009

Sheet 1 of 1

522,032.0 m

Easting: Client: **Baffinland Iron Mines** Project No.: H352034

Northing: 7,948,728.0 m Project: Mary River Expansion Study Stage 2 Datum: Surface Elevation: 136.50 m NAD83

Bottom Elevation: 127.40 m Location: Proposed Rail Alignment Platform: Ground **Total Depth:** 9.1 m

Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig **Date Logged:** 11/28/2016 Logged By: MR

Contract	or: B0	art L	.ong	year	RIG Type/ Mounting: MiniSonic Rig	Date L	.ogg	jea	: 11/28/2016	"	ogge	а ву	:			MR
Driller:	Mid	chae	l Sc	ott	Hole Diameter (mm): 96	Date F	Revi	ewe	ed:2/10/2017	R	eviev	ved I	Ву:			SH/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	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
- 135.5 - 136.5 - 137.5 - 138.	1.0—		H-Casing		SILTY SAND, trace GRAVEL: Light brown, fine to medium grained sand, angular to subangular gravel SILTY SAND, some GRAVEL: Grey, fine to coarse grained sand, angular to subangular gravel SILTY SAND, with COBBLES, with BOULDERS: Grey, coarse grained sand, angular to subangular gravel SILTY SAND, with COBBLES, with BOULDERS: Grey, coarse grained sand, rounded to subrounded cobblesm possible weathered bedrock	Nbn Nf Nf	* · · · · · · · · · · · · · · · · · · ·			13	9	61	30			
-	-		e '1	. / >	To Target Depth. Drillhole BH16-C009 terminated at 9.1m.											-
126.5	10.0									L						
126.5	10.0									_	_					

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11:24 Notes:

BOREHOLE REPORT

BH16-C010

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment 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

C	ontract	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date Logged	d:	11/27/2016	Lo	gge	d By	' :			MR
Dı	iller:	Mic	chae	el Sc	ott	Hole Diameter (mm): 96	Date Review	/ed	d:2/10/2017	_	eviev	ved I	Ву:			SH/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.	Erozen Soil Description Recovery	0	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	- 167.2 - 167.2 - 166.2 - 165.2 - 164.2		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 ICE LENSE: Clear, no texture SANDY SILT, some COBBLES, trace GRAVEL: Subangular to subrounded cobbles Pulvirized ROCK: Possible boulders or bedrock 3.00 m to 4.00 m: Pulverized rock mixed with water WEATHERED ROCK: Dolomitic limestone				12	9	33	58			
	—163.2 —	5.0-		[5.5]	+ + + - + + + + + - + + + + +											-
	- - -162.2 - -	6.0-				Drilling Refusal. Drillhole BH16-C010 terminated at 5.5m.										_
		7.0— 8.0—														
	- - - - - - - - - - - - - - - - - - -	9.0-														-

BAFFINLAND GINT LIBRARY.GLB. Log. ICE BOREHOLE. RAIL ALIGNMENT ALL_WITH ICE LOG_REV.3.GPJ. <

-STAWINGFIIB>> 13:09/2017 11:24 Notes:

BOREHOLE REPORT

BH16-C011

Sheet 1 of 2

525,427.0 m

7,937,567.0 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11:24

Notes:

Mary River Expansion Study Stage 2

NAD83

Ground

Location: Proposed Rail Alignment Platform:

Date Logged: 11/27/2016

Datum:

Bottom Elevation:

Easting:

Northing:

Total Depth: Logged By:

Surface Elevation:

10.7 m UK

179.00 m

168.30 m

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

١,	ontr	acto	r: Bo	art L	.ong	year	RIG Type/ Mounting: MiniSonic Rig	Date L	ogg	ea:	11/2//2016	-	ogge	d By	:			UK
	Orille	r:	E.E	Beac	ham	пр	Hole Diameter (mm): 96	Date R	evie	we	d:2/10/2017	R	eviev	ved I	Зу:			SH/WH
Wotor	vvalei Tionotion	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	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
-	- - - -	78.0	- - - - 1.0-				SANDY GRAVEL, with SILT, trace COBBLES: Grey, coarse grained sand, angular to subangular gravel		_	Z								-
Inchesting to the populations		77.0	2.0—				Dolomitic Boulder: White, pulverized ICE: No soil inclusions, moderate strength, clear to milky white	ICE										-
yacodou!		76.0	3.0-				3.00 m to 6.10m: White to milky white, cloudy, weak strength		\$	Z		100						- - - -
	- - 1: - -	75.0	4.0—						Σ	Z	>>•	100						- - - -
	- 1: - -	74.0	5.0— — — —	Vibracore	H-Casing							400						-
	- - -	73.0	6.0— — — — — 7.0—				6.10m to 7.60 m: White to clear, candled texture in some parts					100						-
	-	71.0	7.0 - - - 8.0-				7.60m to 10.60 m: Soft, colourless to milky white, clear to cloudy, sand inclusions		5	Z		100)					-
	- - - 1:	70.0	9.0-						5	Z	>>•	100						- - - - -
		69.0	10.0															

Project:

BOREHOLE REPORT

BH16-C011

Sheet 2 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

> Mary River Expansion Study Stage 2 Datum:

Location: Proposed Rail Alignment 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:

Orill			3ea		r i	Hole Diameter (mm): 96		Ė		ed:2/1				Re			Ť			SH/V
water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristic (size, grading, shape, roundness), colour structure, accessory components.	S Frozen Soi , Description	Recovery	Sample Type	Cc 0 ⊢	Moisture entent Prof	file	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Oth Tes
-		-		[10.7]		ICE: No soil inclusions, moderate strength, clear to milky white (Continued)	ICE (Continu		M					100						
-	-168.0	11.0-				To Target Depth. Drillhole BH16-C011 terminated at 10.7m.						† 								
-	-167.0 -166.0	12.0-																		
-	-165.0	- - - 14.0-																		
-	-164.0	15.0—																		
-	-163.0	16.0— — —																		
-	-162.0	17.0— — — —																		
-	-161.0	18.0-																		
	-160.0 -159.0	19.0-																		

Project:

BOREHOLE REPORT

BH16-C012

Client: **Baffinland Iron Mines**

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

Contractor	r: Boart l	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date Lo	ogg	ged	l: 11/2	26/201	6			otai L ogge	-				4.6 m MR
Driller:	Michae	el Sc	ott	Hole Diameter (mm): 96	Date R	evi	iew	ed: 2/10	/2017			Re	view	ed E	Зу:			SH/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		Moistuntent I		e 	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Nuopserved due to bermatuost Wat	ded Netty Nety N	asing		structure, accessory components.	Nf Vx		Sample					Fleid	Perce	Perce	Perce	Liquid	Plasti	

Contractor: Boart Longyear

BAFFINIAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNIMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13.09/2017 11.24

BOREHOLE REPORT

BH16-C015

Sheet 1 of 1

Client: Baffinland Iron Mines Project N

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Project No.: H352034

Datum: NAD83

Platform: Ground

Date Logged: 11/24/2016

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

"	Jiiliaci	oi. Do	ait i	Jong	ycai	Rig Type/ Mounting. Willingonic Rig	Date	.ogg	jeu.	. 11/24/2010		Jyye	u Бу	•			UK,MR
D	riller:	E.I	Bea	chan	пр	Hole Diameter (mm): 96	Date F	Revi	ewe	ed:2/10/2017	R	eviev	ved I	Ву:			SH/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	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
rost	- - - - -188.8	- - - 1.0-				SILTY SAND, some GRAVEL, trace COBBLES: Brown to grey, organics, coarse grained sand, angular to sunangular gravel, loose,	Nf				9						-
Unobserved due to permafrost	- - - -187.8 -	2.0-				SILTY SAND, with GRAVEL: Grey, fine to coarse grained sand, angular to subangular gravel	Nf										-
Unob	186.8 	3.0-	i.e	<u>B</u> L		SILTY SAND, some GRAVEL: Light brown to grey, with gravel and cobbles, medium to coarse grained sand,	Vx		✓								-
100000	- - -185.8 - -	4.0-	Vibracore	H-Casing		rounded to subangular gravel											-
		5.0-						5	Z								-
		6.0- - - - - 7.0-															-
AL ALIGNA	-	-		[7.6]		To Target Depth.			4								-
g loe Boneriote ra		8.0-				Drillhole BH16-C015 terminated at 7.6m.											
INI LIBRAKT.GLB LOG	180.8	9.0-															
}	179.8	10.0							_								
No	tes:																

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-C016

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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

	Con	tract	or: Bo	oart l	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ged:	11/24/2016			ogge	-				7.6 m UK	
	Drill	ler:	E.	Bead	cham	пр	Hole Diameter (mm): 96	Date R	levi	ewe	d:2/10/2017		Re	eviev	ved E	Ву:			SH/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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
	Unobserved due to permafrost Water		4.0	Vibracore	H-Casing	Second Se	(size, grading, shape, roundness), colour,		,	Sample 17			By Del We	theorem 25	Dericent 53	22 22	r jdnig r j	Plastic Ir	Tests	
NEAND GIN I LIBRART.	Note:		10.0-																	

BOREHOLE REPORT

BH16-C017

Easting: 538,597.0 m Client: **Baffinland Iron Mines** Project No.: H352034

Northing: 7,919,742.0 m Project: Mary River Expansion Study Stage 2 Datum: Surface Elevation: 159.90 m NAD83

Bottom Elevation: 153.80 m Location: Proposed Rail Alignment Platform: Ground **Total Depth:** 6.1 m

Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig **Date Logged:** 11/23/2016 Logged By: MR

Dr	iller:	Mic	chae	l Sc	ott	Hole Diameter (mm): 96	Date R	evi	ew	ed:2/10/2017		Re	view	ed E	Ву:			SH/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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
15		- - - - 1.0-				SAND, some SILT, trace GRAVEL: Brown to light brown, fine to medium grained sand, rounded to subangular gravel	Vx		\bigvee			24	3	74	22				-
Unobserved due to permafrost		- - - 2.0-				1.50 m to 3.00 m: Trace cobbles												-	
Unobserve	_ _ 156.9	3.0-	Vibracore	H-Casing	. O.	SAND and GRAVEL, some SILT: Yellowish brown to reddish brown, fine	Vx		\bigvee			11						- -	-
		- 4.0- -				to coarse grained sand, rounded to subangular gravel			\searrow									- -	- - -
	_ 154.9 	5.0—										10							- - -
	-	-			, O. C							10							-
	— 153.9 — —	6.0-		[6.1]	<u>`</u> .	To Target Depth. Drillhole BH16-C017 terminated at 6.1m.													
	152.9 	7.0— — —																_	<u>-</u> -
	151.9 	8.0— — —																	- - -
	150.9 	9.0-																_	
	149.9	10.0																	-
Not		10.0																	-

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11:24 Notes:

BAFFINI AND GINT LIBRARY GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ </br>

BOREHOLE REPORT

BH16-C018

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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

	Con	tract	or: Bo	oart I	Long	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ged:	11/10/2016			gge	d By				UK
	Drill	er:	E.	Bea	chan	пр	Hole Diameter (mm): 96	Date R	evi	ewe	ed:2/10/2017		Re	view	ed E	Зу:			SH/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 10	0	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	Unobserved due to permafrost	—159.4 —158.4	1.0-	ē	Bi		SAND, some GRAVEL: Grey, 0.075 mm to 25 mm, angular gravel			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			9	1	82	17			-
3.GPJ < <drawnighie>> 15/08/2017 11.24</drawnighie>	un	—157.4 —156.4 —155.4	3.0- - - - 4.0- - - - 5.0-	Vibracore	H-Casing		INFERRED BEDROCK: Possible Sandstone, greyish white, thinly bedded, 0.075mm, pulverized rock and intact rock, very low strength, weakly cemented			\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\			3						- - - - - - - - - - - - - - - - - - -
COLD LOG ICE BORETICLE PAIL ALIGINIMENT ALL WITH ICE LOG - NEV.		—154.4 —153.4 —152.4	6.0- - - - - 7.0- - - - 8.0- - - - - -		[6.1]		Drilling Refusal. Drillhole BH16-C018 terminated at 6.1m.												
FINLAND GIN I LIBRART.	Note	_150.4_ S:	10.0=	-															-

BOREHOLE REPORT

BH16-C019

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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

0	Cont	racto	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	jed	: 11/10/2016		otai L ogge	-				4.5 M UK	
	Orille	er:	E.I	Bead	cham	пр	Hole Diameter (mm): 96	Date R	evi	ew	ed:2/10/2017	Re	eview	ed E	Зу:			SH/WH	
Wotor	vvalei	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	
I Domochoot of the Domochoot	-	-168.5 -167.5		Vibraco	H-Casing		SAND, trace GRAVEL: Brown to reddish brown, medium to coarse grained sand, medium gravel, angular to subangular	Nf										-	
	- - - -	-164.5	5.0-				Drilling Refusal. Drillhole BH16-C019 terminated at 4.5m.			V		8						-	-
	-	-163.5	6.0-															-	
	- - -	-162.5	7.0- -															-	-
	-	-161.5	8.0-															-	- - - -
9	- - - -	-160.5	9.0-															-	
	-	- 159.5	10.0																-

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-C019B

Sheet 1 of 1

Client: **Baffinland Iron Mines**

Project No.: H352034

Datum:

Project:

Mary River Expansion Study Stage 2

Northing: Surface Elevation:

Easting:

Bottom Elevation:

546,214.0 m 7,920,455.0 m

Location:

Proposed Rail Alignment

NAD83

170.40 m 164.30 m

Platform: Ground

Total Depth: 6.1 m

Rig Type/ Mounting: MiniSonic Rig

	ler:	or: Bo Sa		ong:		Rig Type/ Mounting: MiniSonic Rig Hole Diameter (mm): 96				11/10/2016 2/10/2017			gged view					MF SH/WF
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		Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Tests
Unobserved due to permafrost	- - - -169.4 - - - - - -168.4		Icore	H-Casing		SAND, some GRAVEL: Light brown, medium to coarse grained sand, subangular to rounded gravel SAND: White, fine to medium grained, weakly cemented	Nf											
		3.0- - - 4.0- - - 5.0- - -	-	O-H		4.60 m to 6.10 m: Pulverized with angular pieces of quartz and sandstone observed at 4.6m			•			0	0	98	1			
-	- - - -163.4 - - - - - - -162.4	7.0-				Drilling Refusal. Drillhole BH16-C019B terminated at 6.1m.												
Note	- 161.4 160.4	9.0-																

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-C020

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 11/10/2016

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

0	ontracto	or: Bo	an L	.ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogge	a:	11/10/2016	L	ogge	а ву	:			MR
Dr	iller:	Sa	mue	l Fly	/nn	Hole Diameter (mm): 96	Date F	eviev	ve	d:2/10/2017	R	eviev	ved I	Зу:			SH/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	; - C	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost						SAND: Light brown to grey, medium to coarse grained sand, weakly cemented	Nf	2 8			8						- - - - - - - - - - - - - - - - - - -
		4.0— — — — 5.0—	Vibracore	H-Casing			Nf	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			8						† - - - -
	- 160.0 - - -	6.0— — — —						Σ.									- - - -
		7.0— — — — 8.0— — — — — — — — —		[9.0]		8.50 m: Weakly cemented sandstone			Z		11						-
	- - - - - - - 156.0	9.0-		[]		To Target Depth. Drillhole BH16-C020 terminated at 9.0m.											-

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-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

Oriller:	Sa	mue	ei Fiy	nn	Hole Diameter (mm): 96	Date R	ev	ew	ed:2/10/2017		_	eviev	vea i	By:			SH/WI
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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Test
- 166.1 - 166.1 - 166.1 - 166.1 - 166.1 - 166.1 - 166.1 - 166.1 - 166.1 - 166.1	1.0	Vibracore	Casing		SAND: Light brown, medium to coarse grained sand ICE LENSE: Colorless to grey, medium strength, clear to cloudy texture, sand inclusions SAND, some GRAVEL, trace SILT: Grey to light brown, fine to coarse grained sand, subangular to rounded gravel SAND WITH SOME GRAVEL: grey to light brown, trace silt, subangular, fine to coarse grained, subangular to rounded, poorly bonded, no excess ice, (Nf)	Nf Nbe	<u>α</u>				14						
- - - - - 159.1	8.0-										5	0	67	33			
158.1-	9.0-		[9.0]	. (8.70 m: Light grey powder at 8.7m with angular pieces of quartz sandstone, possible bedrock Drilling Refusal. Drillhole BH16-C021 terminated at 9.0m.						9		07	33			

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11:24

Notes:

BOREHOLE REPORT

BH16-C022

Sheet 1 of 1

547,077.0 m

7,919,746.0 m

163.20 m

Client: Baffinland Iron Mines Project No.: H352034 Easting:
Northing:

Project: Mary River Expansion Study Stage 2 Datum: NAD83

Location: Proposed Rail Alignment Platform: Ground

Bottom Elevation: 154.10 m

Total Depth: 9.1 m

Surface Elevation:

Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig Date Logged: 11/11/2016 Logged By: UK

Dri	iller:	E.E	Beac	ham	пр	Hole Diameter (mm): 96	Date F	Revi	ew	ed:2/10/2017	Re	eview	ed E	Зу:			SH/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	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
Unobserved due to permafrost		3.0	Vibracore	H-Casing Ca	JO ₩ ₩ Y	structure, accessory components. PEAT, with SAND: Grey, black, fragmented SAND, trace SILT: Grey, medium to coarse grained 1.50 m: Loose, fine to coarse grained, poorly bonded, 2.60 m: Moderately banded	Nf Nbn Nf	Reco	Samp		199	O O	- Ber	2	Tjd	Pla		
	- 156.2 			[9.1]		6.40 m: Grey to Brown 7.00 m: Trace cobbles ICE LENSE: Grey to blue, Cloudy texture, minor sand and silt inclusions			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		24						-	
	- - - - 153.2	- - - - 10.0—				To Target Depth. Drillhole BH16-C022 terminated at 9.1m.												-

Contractor: Boart Longyear

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11:24

Notes:

BOREHOLE REPORT

BH16-C023

Easting:

Surface Elevation:

Sheet 1 of 2

547,304.0 m

165.90 m

Client: Baffinland Iron Mines Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

FIOJECT NO.: H352034

Datum: NAD83

Platform: Ground

Date Logged: 11/11/2016

Northing: 7,919,643.0 m

Bottom Elevation: 155.20 m

Total Depth: 10.7 m Logged By: MR

	COIIL	acic	JI. DO	art	Jong	ycai	rig type/ mounting. Willingonic rig	Date	.ogt	jeu		1/11/2010		LOÍ	gget	д Бу.	•			MR	
L	Drille	er:	Sa	mue	l Fly	nn	Hole Diameter (mm): 96	Date F	Revi	ewe	ed:2/	10/2017	\perp	Re	view	ed E	Зу:			SH/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	Co	Moisture ontent Profile	00	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
Ī	permafrost		-			7 77 7 77 77	PEAT, with SAND: Brown to dark grey, medium to coarse grained sand	Nf													Ŧ
	우	164.9	- 1.0- -				SAND, trace SILT: Dark grey to brown, medium to coarse grained sand	Nbn													-
	Unobs	163.9	2.0— —																		
t	- - - -	162.9	3.0-				SAND, trace GRAVEL: Grey to light brown, fine to coarse grained sand, subangular to rounded gravel	Nf	9	abla				16	0	93	7				-
	- - - -	161.9	4.0-				4.60 m to 6.20 m: Light brown, sand														-
	- - - -	160.9	5.0-	Vibracore	H-Casing		and silt, some gravel		9	abla		• 		17	12	44	45				-
100 100 100	- - -	159.9	6.0— — — —				ICE: Colorless to white, soft to moderate strength, clear to cloudy texture, minor silt and sand inclusions		9	~		•		15	12	44	45				-
- INTERNATIONAL	- - -	158.9	7.0-																		
יייייייייייייייייייייייייייייייייייייי	- - -	157.9	8.0-																		
	-	156.9	9.0-																		-
F		.00.8	10.0							_											+

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:

Oril			mue			Hole Diameter (mm): 96	Date		\Box					_	eviev		Ť			SH/V
water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristic (size, grading, shape, roundness), colou structure, accessory components.	Frozen So r, Description	Recovery	Sample Type	Co	Moi: onten	sture t Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Oth Tes
	-	-		[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-									 									
	- - -	140																		
	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																		

Project:

BOREHOLE REPORT

BH16-C024

Sheet 1 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment 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

	Cor	tract	or: Bo	art L	.ong	vear	Rig Type/ Mounting: MiniSonic Rig	Date Lo	ogq	ed:	11/12/2016			tal D gged					10.7 m MR
	Dril				l Fly		Hole Diameter (mm): 96				ed:2/10/2017			view					SH/WH
	Water	Elevation (m)	Depth (m)	Method	Casing	Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	5 0 7		e Type	Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
			- - -				SAND, trace SILT, trace GRAVEL: Light brown, medium to coarse grained sand, rounded to subangular gravel	Nf											-
	o permafrost	—164.0	1.0-																-
	Unobserved due to permafrost	—163.0	2.0-																-
	'n	—162.0	3.0-				3.00 m to 6.00 m: No gravel observed		5	Z									
10/03/2011 11:4-1		—161.0	4.0-																-
3.Gr. >>Dlawingrile>		—160.0	5.0— - - -	Vibracore	H-Casing					Z			18	0	90	10			-
		—159.0	6.0-				6.10 m to 10.70 m: Light reddish brown sand	Vx											-
RAIL ALIGINIMEIN I ALL		—158.0	7.0-										18						-
LOG ICE BOREHOLE		—157.0	8.0— — — —						2	Z									-
JIN I LIBRART.GLB LO		—156.0	9.0-					Vr											-
) INCARE	Note	<u>155.0</u>	10.0				<u> </u>										<u> </u>		

BAFFINLAND GINT LIBRARY.GLB. Log. ICE BOREHOLE. RAIL ALIGNMENT ALL_WITH ICE LOG_REV.3.GPJ. <

-STAWINGFIIB>> 13:09/2017 11:24

BOREHOLE REPORT

BH16-C024

Sheet 2 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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:

П														ŧ						SH/W
water	Elevation (m)	Depth (m)	Method	Casing	Craphio Log	Glapilic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	0	Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Tes
	- -	- - -		[10.7			SAND, trace SILT, trace GRAVEL: Light brown, medium to coarse grained sand, rounded to subangular gravel (Continued)	Nf (Continue		M				14						
		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—																		

BOREHOLE REPORT

BH16-C025

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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

Con	tracto	r: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	.og	ged	l:	11/12/2016		1		d By				7.6 m UK
Drill	er:	E.I	Bead	cham	р	Hole Diameter (mm): 96	Date F	Rev	iew	ed:	:2/10/2017		Re	viev	ved I	Ву:			SH/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	0	Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost	-162.0 -161.0 -159.0		Vibracore	H-Casing		GRAVELLY SILTY SAND: Brown, fine to coarse grained	Nbn Nf	8. B. C.					15	1	89	10			
- - -	-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 To Target Depth.	Vx		<u> </u>										
- - -	-155.0 -154.0					Drillhole BH16-C025 terminated at 7.6m.													

Project:

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-C026

Client: **Baffinland Iron Mines**

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

١,	Con	tracto	or: Bo	art	Long	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ed	: 11/12/2016			ogge					UK	
	Drill	er:	E.	Bea	char	np	Hole Diameter (mm): 96	Date R	evie	ewe	ed:2/10/2017		Re	viev	ved E	Зу:			SH/WH	
14/-4-1	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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
	15	-169.2				11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	SNOW and ROOTLETS SILTY SAND, trace GRAVEL: Dark brown, coarse grained sand	Nf												
-	Unobserved due to permarrost	-168.2	- - - 2.0-					Nbn											,	
	Unobserv	-167.2	3.0-				SILTY SAND, trace GRAVEL: Brown, fine to medium grained	Nbn												
1302/07/07		-166.2	- 4.0- - -				3.90 m to 4.30 m: Some cobbles and gravel ICE: Minor silt inclusions	Nbn		Z			14	6	69	24				-
Camina III		-165.2	5.0- - -	Vibracore	H-Casing		SAND and SILT, trace GRAVEL: Brown, fine grained to medium grained sand			\square				2	77	21				
	-	-164.2	- 6.0- - -				INFERRED BOULDERS SILTY SAND, trace GRAVEL: Grey, fine to coarse grained sand	Nf												
	-	-163.2	7.0- - -							Z			19							-
JOE BONEHOLE MAIL	-	-162.2	8.0- - - -	-					2	Z			13							-
INI LIBRARI GEB LOG		-161.2	9.0-																	
ا ا	lote	=160.2 S:	10.0-		<u> </u>															+

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-C026

Sheet 2 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

NAD83

Platform: Ground

Date Logged: 11/12/2016

Datum:

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

				-	year	Rig Type/ Mounting: MiniSonic Rig				1: 11/1				gge					U
Dril	ller:	E.I	Bea T	chan	np I	Hole Diameter (mm): 96	Date I	Rev	iew	ed:2/10	0/2017			view	ed E	Ву:			SH/W
Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Description	Recovery	Sample Type	Cor	Moisture ntent Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Tes
	- - -	-		[10.7]		SILTY SAND, trace GRAVEL: Grey, fine to coarse grained sand (Continued)	Nf (Continue	⊕d)											
	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-																	
-	- - 	- - -																	
Note	<u>150.2</u>	20.0					· · ·												

Contractor: Boart Longyear

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-C027

Easting:

550,416.0 m

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 11/12/2016

Northing: 7,917,928.0 m

Surface Elevation: 171.00 m **Bottom Elevation:** 158.80 m

Total Depth: 12.2 m Logged By: MR

Dr	iller:	Sa	mue	l Fly	nn	Hole Diameter (mm): 96	Date F	Revie	we	ed:2/10/2017		Re	eviev	ved E	Зу:			SH/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 Lype	Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unoserved due to permafrost		- - 1.0- - - 2.0- - - - 3.0-			10 0 0 0 0 0	SAND and GRAVEL: Peat, dark grey SAND and GRAVEL: Dark grey, medium to coarse grained sand, rounded to subrounded gravel SILTY SAND, trace GRAVEL: Light brown, medium to coarse grained sand, rounded to subangular gravel	Nf Nf Nf Nf											-
		4.0-						Z	Z			10	9	72	20			
	- 165.0 - - - - - - 164.0	6.0— — — — — — 7.0—	Vibracore	H-Casing		ICE: Grey, low to medium strength, cloudy texture SILTY SAND, trace GRAVEL: Light brown to grey, fine to coarse grained sand, rounded to subangular gravel	ICE Nf	Z	Z			16						-
		9.0-				ICE: Grey, low strength, cloudy texture, soil inclusions 7.90 to 12.20 m: Colourless to white, moderate strength, clear to cloudy texture	ICE											

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-C027

Sheet 2 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 11/12/2016

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

Oriller:	Sar	nuel	Fly	nn	Hole Diameter (mm): 96	Date I	Rev	iew	ed:2/10	0/2017		Re	view	ed E	Ву:			SH/WH
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	Cor	Moisture ntent Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	11.0				ICE: Grey, low strength, cloudy texture, soil inclusions (Continued)	ICE (Continu	ed)											
159.0	12.0-	[12.2]		To Target Depth.													
- - - - - 158.0	13.0-				Drillhole BH16-C027 terminated at 12.2m.													
157.0 	14.0-																	
156.0 	15.0—																	
155.0 	16.0-																	
154.0 	17.0-																	
—153.0 — — — ——152.0	18.0-																	
151.0	20.0																	

BOREHOLE REPORT

BH16-C028

Sheet 1 of 2

551,403.0 m

7,916,768.0 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Location:

Mary River Expansion Study Stage 2

Proposed Rail Alignment

NAD83

Bottom Elevation: 177.40 m

Platform: Ground

Datum:

Total Depth:

Easting:

Northing:

Surface Elevation:

11.6 m

189.00 m

	Con	tracto	or: Bo	art L	ona	vear	Rig Type/ Mounting: MiniSonic Rig	Date L	oaa	ed	: 11/12/2016			otai L ogge					11.6 m MR
	Drill				el Fly	-	Hole Diameter (mm): 96				ed:2/10/2017			view	-				SH/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		Sample Type	Moisture Content Profile	100	Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	Unobserved due to permafrost	-187.0 -186.0					SAND and GRAVEL, trace COBBLES: Light brown, medium to coarse grained sand, rounded to subangular gravel SAND, with GRAVEL: Grey, fine to coarse grained sand, rounded to subangular gravel	Nf Nf											-
ANTIGED TOUR TOUR DOTATIONED TOUR ANTIGURATION TO A TOUR TOUR TOUR TOUR TOUR TOUR TOUR TOUR		-184.0 -183.0 -182.0 -180.0	5.0- - - - - - - - - - - - - - - - - - -	Vibracore	H-Casing		SAND, trace SILT: Light grey, fine to course grained sand	Nf					7	0	6	94			-
	-	- 179.0	10.0				9.40 m to 10.70 m: Some gravel and cobbles			<u> </u>			18						

BAFFINLAND GINT LIBRARY.GLB. Log. ICE BOREHOLE. RAIL ALIGNMENT ALL_WITH ICE LOG_REV.3.GPJ. <

-STAWINGFIIB>> 13:09/2017 11:24 Notes:

BOREHOLE REPORT

BH16-C028

Sheet 2 of 2

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Surface Elevation:

Easting:

Northing:

551,403.0 m 7,916,768.0 m

189.00 m

Location: Proposed Rail Alignment

Platform: Ground **Bottom Elevation:** 177.40 m

Contractor: Boart Longyear

Date Logged: 11/12/2016

Datum:

Total Depth: 11.6 m Logged By: MR

Rig Type/ Mounting: MiniSonic Rig

Dri	ller:	Sa	mue	el Fly	nn	Hole Diameter (mm): 96	Date F	kevi	ew	ed:	:2/10/2017			view	/ed l	∃y:			SH/WI
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	0	Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Test
	-	-				SAND, trace SILT: Light grey, fine to course grained sand (Continued)	Nf (Continue												
	178.0 178.0	11.0-				SAND, some GRAVEL, trace COBBLES: Reddish brown, fine to coarse grained sand, angular to subrounded gravel	Nf		\square										
	- 177.0 	12.0-		[12.2]		10.80 m: Possible weathered bedrock, pulverized quartz sandstone 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-																	
		- 17.0- - -																	
	- 171.0 - -	- 18.0- - -																	
		19.0- - -																	
	169.0	20.0																	

BAFFINLAND GINT LIBRARY.GLB. Log. ICE BOREHOLE. RAIL ALIGNMENT ALL_WITH ICE LOG_REV.3.GPJ. <

-STAWINGFIIB>> 13:09/2017 11:24

BOREHOLE REPORT

BH16-C029

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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

	Cor	tracto	or: Bo	art L	.ona	vear	Rig Type/ Mounting: MiniSonic Rig	Date L	oaae	ed:	11/13/2016	1	otal I ogge	Depti d Bv				7.6 m UK
	Dril				cham		Hole Diameter (mm): 96				d:2/10/2017		eviev					SH/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	Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	Unobserved due to permafrost	-184.3 -183.3					SILTY SAND: Brown to reddish brown, fine grained sand	Nbn	Z	Z		21	1	75	25			- - - - - - - - - - - - - - - - - - -
הייו וייטייסיין איטוקרוופאר איטוקרוואסוטר איטוקרוואסוטר איטוקרוו		—181.3 —180.3	4.0-	Vibracore	H-Casing		3.70 m to 6.10 m: Low-strength pieces of rock		Σ.	Z								- - - - - - - - - -
ALIGNIMENT ALL WITH THE LOG NEW		—179.3 —178.3	6.0-		[7.6]			_	Σ.	Z								- - - - - -
NI LIBRART.GLD LOG INE DUNETIULE INNEL I	-	—177.3 —176.3	 8.0- 9.0-				To Target Depth. Drillhole BH16-C029 terminated at 7.6m.											- - - - - - - -
is a large	Note	<u>-175.3</u> S:	10.0							1								

BOREHOLE REPORT

BH16-C030

Sheet 1 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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:

(Con	tracto	or: Bo	art L	_ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ed:	11/15/2016			ed B				MR
	Orille	er:	Mie	chae	el Sc	ott	Hole Diameter (mm): 96	Date R	levie	we	d:2/10/2017			ewed				SH/WH
10/0+0/1	vvalei	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 I ype	Moisture Content Profile	Water Content	$\overline{}$			Liquid Limit	Plastic Index	Other Tests
	-		- - -				SAND, trace GRAVEL: Light brown, medium to coarse grained sand, rounded to subrounded gravel	Nf										
4000		-159.8	1.0-				CAND trees CHT trees CDAVEL Light	- //-	2	2								_
+00430000000000000000000000000000000000	I Aca and to be	-158.8	2.0-				SAND, trace SILT, trace GRAVEL: Light brown, fine to coarse grained sand	Vc	Σ	Z		1.	4					-
		-157.8	3.0-															- - - -
107/00/01	-	-156.8	4.0— - - -						Σ	Z								-
Silving Silvin	-	-155.8	5.0— —						2	Z		1	9 3	94	3			-
	-	-154.8	6.0— - - -	Vibracore	H-Casing		ICE and SOIL: White, low strength, cloudy texture, mixed with SILTY SAND	_										-
	-	-153.8	7.0— —															-
פטירו וסרר י מייריי	-	-152.8	8.0— -															-
יייי פייי פיייי	-	-151.8	9.0-															 - - -
	otes	-150.8	10.0			>												

BAFFINLAND GINT LIBRARY.GLB. Log. ICE BOREHOLE. RAIL ALIGNMENT ALL_WITH ICE LOG_REV.3.GPJ. <

-STAWINGFIIB>> 13:09/2017 11:24 Notes:



Contractor: Boart Longyear

BOREHOLE REPORT

BH16-C030

Sheet 2 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 11/15/2016

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

Dril	ler:	Mi	chae	l Sc	ott	Hole Diameter (mm): 96	Date I	Revi	iew	ed:2/10	/2017		Re	view	ed E	Зу:			SH/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	Con	Moisture tent Profile	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]	<u> </u>					ll i	ii								
DATE TRANSPORT TO BE LOG TO DETECTED TO THE TRANSPORT TO THE TOTAL TOTAL TRANSPORT TO THE T		13.0— 14.0— 15.0— 16.0— 16.0— 16.0— 16.0— 16.0— 16.0—				To Target Depth. Drillhole BH16-C030 terminated at 12.2m.													
		17.0-																	
	- 142.8 -	18.0-								 									
ייי בייייייייייייייייייייייייייייייייי	- - 141.8 - - -	19.0- - - -								 									
Note	<u>-140.8</u> es:	20.0-						<u> </u>											

BOREHOLE REPORT

BH16-C031

Easting:

Northing:

Surface Elevation:

556,864.0 m

7,915,216.0 m

170.00 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment Datum: NAD83

Ground

Bottom Elevation: 168.50 m

Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig **Date Logged:** 11/15/2016

Platform:

Total Depth: 1.5 m Logged By: UK

(m) ı			od	Soil Description							ınt						
Depth (m)	Method	Casing	Graphic Log	TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	C (Moisture ontent Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Test
- - - 1.0-				SAND, trace GRAVEL: Brown, fine to coarse grained sand, angular to subangular gravel	Nf												
2.0-				To Target Depth. Drillhole BH16-C031 terminated at 1.5m.				•		·							
3.0-																	
4.0-																	
5.0-																	
6.0-																	
7.0-																	
8.0-																	
9.0-																	
	20- - - - 30- - - - - - - - - - - - - - -	2.0- - - - 3.0- - - - - - - - - - - - - - - - - - -	1.5] - [1.5] - [1.5] [1.5]	2.0- - - 3.0- - - - - - - - - - - - - - - - - - -	To Target Depth. Drillhole BH16-C031 terminated at 1.5m. To Target Depth. Drillhole BH16-C031 terminated at 1.5m.	coarse grained sand, angular to subangular gravel To Target Depth. Drillhole BH16-C031 terminated at 1.5m.	coarse grained sand, angular to subangular gravel To Target Depth. Drillhole BH16-C031 terminated at 1.5m. To Target Depth. Drillhole BH16-C031 terminated at 1.5m.	coarse grained sand, angular to subangular gravel To Target Depth. Drillhole BH16-C031 terminated at 1.5m.	coarse grained sand, angular to subangular gravel To Target Depth. Drillhole BH16-C031 terminated at 1.5m.	Coarse grained sand, angular to subangular gravel To Target Depth. Drillhole BH16-C031 terminated at 1.5m.	coarse grained sand, angular to subangular gravel To Target Depth. Drillhole BH16-C031 terminated at 1.5m.	coarse grained sand, angular to subangular gravel To Target Depth. Drillhole BH16-C031 terminated at 1.5m.	Coarse grained sand, angular to subangular gravel To Target Depth. Drillhole BH16-C031 terminated at 1.5m.	Coarse grained sand, angular to subangular gravel To Target Depth. Drillhole BH16-C031 terminated at 1.5m.	Coarse grained sand, angular to subangular gravel To Target Depth. Drillhole BH16-C031 terminated at 1.5m.	Coarse grained sand, angular to subangular gravel To Target Depth. Drillhole BH16-C031 terminated at 1.5m. To Target Depth. Drillhole BH16-C031 terminated at 1.5m.	Coarse grained sand, angular to subangular gravel To Target Depth. Drillhole BH16-C031 terminated at 1.5m.

Contractor: Boart Longyear

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-C032

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 11/15/2016

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

				Ŭ	,	5 7.		55				- 30	,	,				IVIIX
	riller:	Mie	chae	el Sc	ott	Hole Diameter (mm): 96	Date F	Revie	we	ed:2/10/2017	I	Revi	ewe	d B	By:			SH/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	Domont Course		Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
<u> </u>		- - - - 1.0-			77 77 77 77 77 77 77 77 77 77 77 77 77	PEAT, with SAND and GRAVEL: Brown, medium to coarse grained sand, rounded to subangular gravel	Nf	_	Z									
Inobserved due to nermafrost	- 169.0	2.0-			<u> </u>	SILTY SAND, some GRAVEL: Light brown, medium to coarse grained sand, rounded to subangular gravel	Nf											-
ayriesdoul I		3.0-			.000	SILTY SAND and GRAVEL, trace COBBLES: Light brown, medium to coarse grained sand, rounded to subrounded cobbles	Nf	<u> </u>			1	1 1	0 7	71	19			
13/03/2017 11.57	167.0 	4.0- - - - - 5.0-	Vibracore	H-Casing			Vc	Σ										
V c. Gro V. Crawingriie		6.0-						X	Z									
77-00-100-100-100-100-100-100-100-100-10	- - -164.0 - - -	7.0-				ICE and SOIL: Dark grey to light brown, cloudy texture, ice mixed with silty sand	ICE	Σ										-
TOLE PAIC ALIGNMEN	163.0 	8.0- - - - - 9.0-		[9.1]	. O.	SILTY SAND and GRAVEL, trace	Vc	S										
ואאאו יטבם בעש וער מעייר	- - - - - -161.0	10.0-			, . O.	COBBLES: Light brown, medium to coarse grained sand, rounded to subrounded cobbles To Target Depth. Drillhole BH16-C032 terminated at 9.1m.												
N.	160.0 otes:	11.0-																

BOREHOLE REPORT

BH16-C201

Sheet 1 of 1

553,750.0 m

Easting: Client: **Baffinland Iron Mines** Project No.: H352034

Northing: 7,915,276.0 m Project: Mary River Expansion Study Stage 2 Datum: Surface Elevation: 178.00 m NAD83

Bottom Elevation: 175.60 m Location: Proposed Rail Alignment Platform: Ground **Total Depth:** 2.4 m

Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig **Date Logged:** 11/18/2016 Logged By: UK

				٠ .	year	Rig Type/ Mounting: MiniSonic Rig	Duto L	vyy	cu.	: 11/18/2016			gge	By:				UK
I	Oriller:	E.E	Bead	cham	р	Hole Diameter (mm): 96	Date R	evie	we	ed:2/10/2017		Re	view	ed E	By:			SH/WH
20,001	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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
to colonia of a	- 177.0 - 177.0 - 176.	1.0-	Vibracore	H-Casing		SAND, some GRAVEL, trace COBBLES: Reddish brown, fine to coarse grained sand, angular to subangular gravel, some silt												- - - - - -
1000	- 176.0 	2.0-		[2.4]		ROCK: Weak to medium strong, sedimentary, grey and white crystals			Z									 - -
	- - -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-																+
100	- - 169.0 -	9.0-																+
	168.0	10.0																_

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11:24 Notes:

BOREHOLE REPORT

BH16-C202

Sheet 1 of 1

166.90 m

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

Total Depth: 7.6 m

Bottom Elevation:

С	ontract	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date Lo	gge	ed:	11/16/2016			gge	•				MR
D	riller:	Sa	ımue	el Fly	'nn	Hole Diameter (mm): 96	Date Re	vie	we	d:2/10/2017		Re	view	ed E	Зу:			SH/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	Sample Lype	Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to permafrost			Vibracore	H-Casing		TOPSOIL, SILTY SAND, with GRAVEL SILTY SAND, with GRAVEL: Light brown, medium to coarse grained sand Crushed COBBLES and BOULDERS: Grey to pink, fine to coarse grained sand	Nf Nf											-
1000 TO THE	- 169.5 168.5 168.5 	5.0- 6.0- 7.0-		[7.6]		BOULDERS: Grey to light green, granitic gneiss and chloritic schist, medium to coarse grained, very thinly bedded, medium strength, slightly weathered INFERRED BEDROCK: Laminated to very thinly bedded, faintly weathered,												-
		9.0-				To Target Depth. Drillhole BH16-C202 terminated at 7.6m.												-

BAFFINLAND GINT LIBRARY.GLB. Log. ICE BOREHOLE. RAIL ALIGNMENT ALL_WITH ICE LOG_REV.3.GPJ. <

-STAWINGFIIB>> 13:09/2017 11:24

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-C203

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 11/17/2016

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

100	ontracto	or: Bo	an L	ong	year	RIG Type/ Mounting: MiniSonic Rig	Date L	.ogge	ea:	11/1//2016	L	ogge	а ву	:			UK
Dr	iller:	E.E	3eac	chan	np	Hole Diameter (mm): 96	Date F	Revie	we	d :2/10/2017	R	eviev	ved I	Ву:			SH/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	2 df : 2	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
rost	- - - - -176.0	- - - 1.0-				SILTY SAND, some COBBLES, trace BOULDERS: Grey, fine to coarse grained sand, angular to subangular cobbles	Nf	>									-
Unobserved due to permafrost	- - - 175.0	- - 2.0-				SILTY SAND, some GRAVEL: Brown, fine to coarse grained sand	Nf										- - -
Unobser	- - 174.0 -	3.0-				SILTY SAND: Brown, fine to medium grained	Nbn										-
100000	- 173.0 - - -	4.0-	Vibracore	H-Casing					z								-
	172.0 	5.0— — —				BOULDER: Sandstone, medium		Σ.	z								- - - -
		6.0— — — — — 7.0—				grained, medium bedded, weak WEATHERED ROCK: Mafic gneiss with crystalline fines observed, shiny face when fracutured, grey and white streaks			z								-
	- - - - -169.0	- - - 8.0-				BEDROCK: Gneiss, grey and white bedding layers, approximately 40 mm, thinly bedded,weak to medium quality											- - - - -
- CE - CG CE - EG	- - 168.0	9.0-		[9.1]		To Target Depth.			z								
IND GIN FIED CITY	- - - 167.0	- - 10.0-				Drillhole BH16-C203 terminated at 9.1m.											

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-C204

Easting: 555,659.0 m Client: **Baffinland Iron Mines** Project No.: H352034

Northing: 7,915,432.0 m Project: Mary River Expansion Study Stage 2 Datum: Surface Elevation: NAD83 173.00 m

Bottom Elevation: 170.30 m Location: Proposed Rail Alignment Platform: Ground **Total Depth:** 2.7 m

Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig Date Logged: 11/16/2016 Logged By: MR

	liacio	r: Bo	art L	.ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	.og	ge	d:	11/16/2016		Lo	ogge	d By	:			MR
Drille	er:	Sa	mue	l Fly	nn	Hole Diameter (mm): 96	Date F	Rev	iew	/ed	d:2/10/2017		Re	eviev	ved I	Зу:			SH/WH
Water Elevation (m) Depth (m) Method Casing Graphic Loq						Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	0	Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
ved due to permafrost	-172.0 -171.0	1.0-	Vibracore	H-Casing		···	Nf Nf												
- - -	-170.0 -169.0	3.0-		[2.7]															
-	-168.0 -167.0	5.0— - - - - 6.0— -				INFERRED BEDROCK: Grey, pulveriszed boulders of gneiss or Franklin diabase observed, subcohesive, no bedding													
-	-166.0 -165.0	7.0-																	
-	-164.0	9.0-				Drilling Refusal. Drillhole BH16-C204 terminated at 2.7m.	_												

BAFFINLAND GINT LIBRARY.GLB. Log. ICE BOREHOLE. RAIL ALIGNMENT ALL_WITH ICE LOG_REV.3.GPJ. <

- CarawingFile>> 13:09/2017 11:25

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

	Con	tracto	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date Lo	gg	ed:	11/21/2016		.ogg		•	•			UK
	Drill	er:	E.I	Bead	chan	пр	Hole Diameter (mm): 96	Date Re	vie	ewe	d:2/10/2017	F	Revie	we	d By	y:			SH/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	Kecovery	Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Grave		Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	Unobserved due to permafrost	-172.0 -171.0	1.0-				SAND, with GRAVEL, some COBBLES, trace BOULDERS: Brown, coarse grained sand, rounded to subangular cobbles and gravel GRAVELLY SILTY SAND: Brown to grey, coarse grained sand, rounded to subangular gravel	_		Z									-
2000	Unobserve	-170.0 -169.0	3.0-	Vibracore	H-Casing					<u> </u>		6	20) 4	17	33			- - - - -
	-	-168.0 -167.0	5.0-			+ + + + + + + +	INFERRED BEDROCK: Granitic, white, crushed and pulverized rock pieces		2	Z									-
	-	-166.0 -165.0	- - 7.0- - - - - 8.0-			+ + + + + + + + + + + + + + + + + + +			2	✓									-
J GIN I LIBRARY GLB LOG ICE BUREHULE	-	-164.0 -163.0	9.0-		[8.5]	+ + + + + + + + + + + + + + + + + + + +	Drilling Refusal. Drillhole BH16-C205 terminated at 8.5m.												
TINING.	Note		10.0						_		· · ·								

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

BOREHOLE REPORT

BH16-C206

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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

	Co	ntract	or: Bo	oart l	_ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	jed:	11/22/2016		1	gge	-				9.1 m UK
	Dri	ller:	E.	Bead	chan	np	Hole Diameter (mm): 96	Date R	levi	ewe	ed:2/10/2017		Re	view	ved E	Зу:			SH/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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
LOG ICE BORETOLE MAIL ALL'ANTH ICE LOG - NEV 3:0F3 - NOTAMINGHIEN 11.20	Unobserved due to permafrost		1.0	Vibracore	H-Casing		SAND: White to grey, pulverized rock, weak to moderate strength, fine grained SILTY SAND, some GRAVEL: Dark brown, fine to medium grained sand, angular to subangular gravel ICE, with Sandy SILT inclusions: Grey, cohesive, fine grained, hard, cloudy SAND and GRAVEL: Reddish brown SANDY SILT, trace GRAVEL: Dark grey, find grained sand BOULDERS: Grey, white to grey, pulverized rock, medium strong SANDY SILT, trace GRAVEL: Dark brown to grey, find grained sand INFERRED BEDROCK: Light grey, pulverized rock with intact pieces, medium strong	Nf Nf ICE Vc Vr Nbn		No. of the state o		>>•	53	<u>a</u>	<u>a</u>	<u>«</u>		d.	
AND GIN LIBRART.GLD	NI=/	164.0 	9.0-		[9.1]	+ + +	To Target Depth. Drillhole BH16-C206 terminated at 9.1m.												
Ĭ	Note	es:																	

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

BOREHOLE REPORT

BH16-C207

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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

	Con	tract	or: Bo	oart I	_ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	jed:	11/21/2016	1		ed By				7.3 m MR
	Drill	er:	Sa	amue	el Fly	/nn	Hole Diameter (mm): 96	Date R	levi	ewe	ed:2/10/2017	F	evie	wed l	Ву:			SH/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 10	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
67:1	Unobserved due to permafrost	-174.0 -173.0 -172.0		Vibracore	H-Casing		SAND and GRAVEL, some COBBLES: Brown, medium to coarse grained sand, subangular to rounded gravel and cobbles SAND, some GRAVEL, trace COBBLES: Grey to light yellow, medium to coarse grained sand, rounded to subangular gravel	Nf Vx	***************************************	Z		12						- - - - - - - - - - - - - - - - - - -
E LOG_REV 3. GPJ << DIAWIIIgFIIE// 13/03/2017 1		-170.0 -169.0	5.0-				INFERRED BEDROCK: Light grey,			<u> </u>		2						- - - - - - - - -
LIGNIMEN I ALL WITH IC		-168.0	7.0-		[7.3]		pulverized rock, with intact pieces of sandstone, medium strong Drilling Refusal.											-
I LIBRARY GLB LOG ICE BUREHULE KAIL AL		-167.0 -166.0					Drillhole BH16-C207 terminated at 7.3m.											
-INLAND GIN	Note	<u>-165.0</u> S:	10.0-	1							<u> </u>							

BOREHOLE REPORT

BH16-Q001

Sheet 1 of 1

505,308.0 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Bottom Elevation:

Easting:

Northing:

Total Depth:

Surface Elevation:

7,972,797.0 m 68.25 m

Location: Potential Quarry Location

Platform: Ground 63.65 m

4.6 m

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/5/2016

Datum:

Logged By: MR Reviewed By: SH/WH

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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
		- - - 1.0-				ORGANICS: Frozen organic soil SAND, some GRAVEL, trace COBBLES: Medium to coarse grained sand, fine to coarse gravel, light brown, subangular to rounded	Nf		X									_
to permafrost		2.0-	Vibracore	H-Casing		SAND and GRAVEL trace COBBLES: Coarse sand, fine to coarse gravel, light brown to grey, subangular to rounded	Nf		\searrow									- -
observed due		3.0-				3.00 m to 4.60 m: Trace COBBLES												
13/09/2017 11	64.3 	4.0-		[4.6]		To Target Depth. Drillhole BH16-Q001 terminated at												
OG_REV 3.GPJ < <drawingfile>></drawingfile>	62.3	- - - 6.0-				4.6m.												_
HOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ	- - 61.3	7.0-																_
		8.0— - - -																_
BAFFINLAND GINT LIBRARY.GLB LOG ICE BORE	59.3 	9.0-																
BAFFINLAND	<u></u> 58.3	10.0												<u> </u>	1	1		

BOREHOLE REPORT

BH16-Q7001

529,144.0 m

7,927,494.0 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Location:

Mary River Expansion Study Stage 2

Potential Quarry Location

Datum: NAD83

Platform:

Ground

Total Depth:

Easting:

Northing:

Surface Elevation:

Bottom Elevation:

184.20 m 3.6 m

187.80 m

	Con	itracto	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	.og	ged	d: 10/24/2016		gge					CS CS
	Drill	ler:	E.E	3eac	chan	пр	Hole Diameter (mm): 96	Date F	lev	iew	red: 2/10/2017	Re	view	ved E	Зу:			SH/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
	Water	- - - 186.8	- - - 1.0-				Silty GRAVEL: Light brown, pulverized rock flour (limestone), light grey, subangular to angular limestone, up to 80mm			\times								
	Unobserved due to Water	- 	- 2.0- - -	Vibracore	H-Casing		SILT, some GRAVEL, trace SAND: Light brown, angular, fine to coarse			\square		11						- - - -
	-		3.0-		[3.6]		LIMESTONE: Pulverized, subrounded to round, grey			X								
13/09/2017 11:25	-		4.0— — —				To Target Depth. Drillhole BH16-Q7001 terminated at 3.6m.											-
3.GPJ < <drawingfile>></drawingfile>	-		5.0— — —															-
WITH ICE LOG_REV 3.	-		6.0— — —															-
KAIL ALIGNMEN I ALL_V	-		7.0— — —															-
		- 179.8 - -	8.0— — —															-
ND GINT LIBRARY.GLB LOG ICE BOREHOLE	-	—178.8 -	9.0— — — —															-
ے ا	\perp	177.8	10.0															

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25 Notes:

Location:

BOREHOLE REPORT

BH16-Q7002

530,561.0 m

Easting: Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Potential Quarry Location

NAD83

Platform: Ground

Datum:

Northing: 7,928,150.0 m Surface Elevation: 284.00 m

Bottom Elevation: 277.14 m

Total Depth: 6.9 m

Contrac					Rig Type/ Mounting: MiniSonic Rig	Date I	_	_				ogge	-				RS/C
Oriller:	_	Bea	acha	Ť	Hole Diameter (mm): 96	Date F	⊀ev	iew	red:2/10/2017		_	eviev	wed I	Ву:			SH/W
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 Profil	e 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Test
283.0 283.0 283.0 282.0 282.0 281.0 280.0 	3.1	HO.3 Corina	asina		No recovery Silty GRAVEL, some COBBLES: Brown, fine to coarse gravel, subangular to angular No recovery LIMESTONE: Grey, fragmented, angular to subangular, limestone bedrock Silty GRAVEL, with COBBLES: Light brown, cobbles and gravel are angular to subangular, grey			8									
277.0 		-			To Target Depth. Drillhole BH16-Q7002 terminated at 6.9m.					 							
- - 275.0 -	9.0	- - - - -								 							

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

BOREHOLE REPORT

BH16-Q7003

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Potential Quarry Location

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

	Cor	tracte	or: Bo	art l	_ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogge	ed:	10/24/2016	Logge	d By:		9.1 m RS
	Dril	ler:	E.I	Зеа	chan	пр	Hole Diameter (mm): 96	Date R	evie	we	d :2/10/2017		ved By:		SH/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	odiliple i ype	Moisture Content Profile				Other Tests
0.72	Unobserved due to Permafrost	—199.0 —199.0		<u>.</u>	БU		SILT and GRAVEL, trace SAND: Fine grained, angular, beige/grey 1.50 m to 5.00 m: Visible ice layers, up to 5 mm thick	Vs	<u> </u>	<					- - - - - - - - - - - - - - - - - - -
6 KEV S.GPJ SSDIGWIIIgFIII6/7 15/03/2017 11.4				Vibracore	H-Casing		SAND: Fine to medium, brown Gravelly SILT: Well graded, grey	Nbn	Σ						-
NIC ALIGINIMEN I ALL WITH I OF LO			7.0— 8.0—				Start of Coring at 7.3m. Continued on Rock Core Log sheet.	_							
IN I LIBRARY GLB LOG ICE BUREHULE RA			9.0-												- - - - - - - - - - - - - - - - - - -
IN LAIN D	Note	<u>190.0</u>	11.0-	<u> </u>	<u> </u>					_					



BOREHOLE LOG

ROCK CORE FORMAT

BH16-Q7003

531,053.0 m

7,929,065.0 m

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Datum: NAD83

Location: Potential Quarry Location

Platform: Ground

Bottom Elevation: 191.90 m **Total Depth:**

Easting:

Northing:

Surface Elevation:

9.1 m RS

201.00 m

	Cor	ntracto	or: Bo	art L	.ona	/ear	Ria Tvo	e/ Mounting:	MiniSonic Rig	Bearing:	N/A	D	ate Lo	oaaed:	10/24/2	2016			gged By:		RS RS
	Dril				ham			ameter (mm):		Plunge:	Vertica				2/10/20						
+	וווע		□.1	Jeac	ııdıi		i ioie Di	ameter (IIIII):	Rock Descrip		v ei tica	ם וג	ale C	iiecked:	2/10/20			Ke.	viewed By:	SH/\	/VH
	Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Geological Unit	colour,	ROCK TYF n size, texture general defec minor constitu	PE; and fabric, ct condition	S,	Weathering/ Cementation		mated ength	Is ₍₅₀₎ [UCS] MPa	Sp	efect acing mm [00.1]	RQD %			
BAFFINLAND GINT LIBRARY.GLB Log CORED BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV3.GPJ < <drawningfile>> 04/102017 16:45</drawningfile>	S	- 200.0 199.0 197.0	1.0 —		[9.1]			Resuming LIMESTON pulverized I	<i>in Rock Core</i> E: Bedrock, fr rock sample	Format 7.3	/	× 0		□ 3		007	580	RO			
LIBR	Note		11.0																		
GINT																					
LAND																					
AFFINI																					
₩.																					

BOREHOLE REPORT

BH16-Q7004

Sheet 1 of 3

529,264.0 m

7,927,466.0 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Datum:

Easting:

Northing:

Surface Elevation:

282.80 m

	Loc	atior	ղ։	Р	oter	ntial Quarry Location	Platf	or	m:	Ground	Во	ttom	n Ele	evati	on:	272.20 m
_	Contractor: Boart Longyear					Rig Type/ Mounting: MiniSonic Rig				d: 10/25/2016		tal D gged	-			10.6 m
	riller:			cham		Hole Diameter (mm): 96		_	_	ved:2/10/2017		yged view				RS/CS
	T	L.I	Deac	IIaII			Date	VE V	lew	/eu.2/10/2017	Re	view	reu i	эу.		SH/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						Other Tests
AND GINT LIBRARY GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <- DrawingFile> 13/09/2017 11;25 Unobserved due to Permafrost			Vibracore	H-Casing		SILT and GRAVEL: Grey, pulverized limestone No recovery Start of Coring at 4.6m. Continued on Rock Core Log sheet.		α								
BAFFINLAND GINT	272.8 otes:	10.0														



Client:

BOREHOLE LOG

ROCK CORE FORMAT

BH16-Q7004

Sheet 2 of 3

529,264.0 m

7,927,466.0 m

Project No.: H352034

Project: Mary River Expansion Study Stage 2 **Datum:**

Baffinland Iron Mines

NAD83

Date Logged: 10/25/2016

Location: Potential Quarry Location Platform:

Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig Bearing: N/A

Ground

i i u

Total Depth:

Logged By:

Easting:

Northing:

Surface Elevation:

Bottom Elevation:

272.20 m 10.6 m RS/CS

282.80 m

								e/ Mounting: MiniSonic Rig		N/A		ate Log				Logged		RS/CS	
L	Dril	ler:	E.f	Bead	cham	р	Hole Di		Plunge:	Vertica	al D	ate Che	cked:	2/10/20	17	Review	red By:	SH/WH	_
	Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Geological Unit	Rock Descript ROCK TYPE Grain size, texture a colour, general defect minor constitue	E; and fabric, condition	S,	Weathering/ Cementation	Estima Strenç ⊞≒⊥≥.	gth	Is ₍₅₀₎ [UCS] MPa	Defect Spacing mm [00]	RQD %			
16.45		- 281.8 - 281.8 - 280.8 - 279.8																	
RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ < <drawingfile>> 04/10/2017 16:45</drawingfile>		- - - - 277.8	5.0 —					Resuming in Rock Core F LIMESTONE: Light grey to bedded, weak to medium s faintly weathered	brown, th	nickly				- - - - -					
TH ICE LOG_REV 3.GPJ		- 276.8 - 276.8	6.0 —					6.00 m to 7.70 m: Medium thickly bedded, fresh limes strong						- - - -					
IL ALIGNMENT ALL_WI		275.8 - - - 274.8	7.0 —	HQ-3 Coring	외			7.70 m to 10.60 m: Weak		m				- - - -		99			
BAFFINLAND GINT LIBRARY.GLB LOG CORED BOREHOLE RAI		- 273.8 273.8 	9.0 —					strong, subhorizontal joints	•					- - - - - -		- 25			
BAFFINLAND GINT LIBRA	Note		10.0 —																



E.Beachamp

Baffinland Iron Mines

Potential Quarry Location

Mary River Expansion Study Stage 2

Client:

Project:

Location:

Driller:

BOREHOLE LOG

ROCK CORE FORMAT

BH16-Q7004

Sheet 3 of 3

Easting:

529,264.0 m

Northing: Surface Elevation: 7,927,466.0 m 282.80 m

Bottom Elevation:

272.20 m

Total Depth:

10.6 m RS/CS

Logged By:

Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig Bearing: N/A Date Logged: 10/25/2016 Hole Diameter (mm): 96 Plunge:

Datum:

Platform:

Vertical **Date Checked: 2/10/2017**

Project No.: H352034

NAD83

Ground

Reviewed By: SH/WH

L		iici.			JIIaii	۳.		ameter (mm). 90 mange. Vertica		 	. 2/10/20					viewed by.	H/VVH
	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	timated rength	Is ₍₅₀₎ [UCS] MPa	S	paci paci mm	ng I	RQD %		
		-	-		[10.6]						-				. 68		
		-	-					To Target Depth.			-	Ħ					
	ŀ	271.8 _	11.0 —					Drillhole BH16-Q7004 terminated at 10.6m.			_		İ				
	ŀ	-	-								-						
		270.8	12.0 —								-						
		-	-								-						
		-	-								-						
		— 269.8 –	13.0 —								_		 				
	ŀ	-	-								-						
16:45	ŀ	- 268.8	14.0 —								-						
0/2017	}	-	-								-		İ				
>> 04/7		-	-								-		İ				
awingFile		— 267.8 –	15.0 —								-						
J < <drain< td=""><td></td><td>-</td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td></drain<>		-	-								-						
EV 3.GP	ŀ	- 266.8	16.0 —								-						
LOG_R		-	-								-						
/ITH ICE		- -	-								-						
T ALL_V	ŀ	265.8 -	17.0								-						
BNMEN.		-	-								-		İ				
SAIL ALI		- 264.8	18.0 —								_		i				
HOLE F		-	-								-		İ				
D BORE		-	-								-						
CORE		— 263.8 –	19.0 —								-						
3LB Log		-	-								-						
BAFFINIAND GINT LIBRARY.GLB Log CORED BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ < <drawingfile>> 04/10/2017 16:45</drawingfile>			20.0 —								-						
GINT	Note	es:															
INLAND																	
BAFF																	

BOREHOLE REPORT

BH16-R003

Sheet 1 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment 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

	Cor	tracte	or: Bo	art L	.ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ed:	10/5/2016			gge					UK	
	Dril	ler:	Va	nce	Mad	lden	Hole Diameter (mm): 96	Date R	evie	we	ed:2/10/2017		Re	view	ed E	Зу:			SH/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 Lype	Moisture Content Profile 0 50 100	0	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
DIGINI LIBRARY.GLB LOGICE BOREHOLE RAIL ALIGNMENI ALL_WITHICE LOG_R	Unobserved due to permafrost	—60.5 —60.0 —59.5 —59.5 —58.0 —57.5 —56.5			H-Casing		SAND and GRAVEL: Fine to coarse grained sand 3.00 m to 4.6 m: Trace Cobbles	Nf Nf												

BAFFINLAND GINT LIBRARY.GLB. Log. ICE BOREHOLE. RAIL ALIGNMENT ALL_WITH ICE LOG_REV.3.GPJ. <

-CDrawingFile>> 13:09/2017 11:25 Notes:

BOREHOLE REPORT

BH16-R003

Easting:

Sheet 2 of 2

504,513.0 m

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Northing: 7,975,552.0 m Surface Elevation: 61.00 m

Bottom Elevation: 55.40 m

Total Depth: 5.6 m Logged By: UK

	Contr	actor	: Bo	art L	.ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	.ogg	ged	d: 10	0/5/2016		gge	d By:				5.6 m UK	
	Drille	r:	Va	nce	Mad	den	Hole Diameter (mm): 96	Date F	Revi	ew	ed:2	/10/2017	Re	view	ed E	Ву:			SH/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	O	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
	-		- - -				SAND and GRAVEL: Fine to coarse grained sand (Continued)	Nf (Continue												-
	-	5.5	5.5-		[5.6]	0 0	To Target Depth. Drillhole BH16-R003 terminated at 5.6m.													
	- 5 -	4.5	6.5-																-	- - -
	- - - - -	4.0	7.0—																- -	-
	5 	3.5	7.5—																	-
	5 	3.0	8.0-																	-
SI SECTION EN	5	2.5	8.5—																-	- - -
200	5	2.0	9.0-																<u>-</u>	- - -
מולו בוכוימינים ביו	5 	1.5	9.5																	- - -

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

Notes:

BOREHOLE REPORT

BH16-R004

Sheet 1 of 1

507,259.0 m

Easting: Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Northing: 7,970,638.0 m Surface Elevation: 43.00 m

Bottom Elevation: 38.43 m

Total Depth: 4.6 m Logged By: MR

Co	ontract	or: Bo	art L	.ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	.ogg	jed	l: 10/6/2016		1		d By:				4.6 m MR	
Dr	iller:	Sa	mue	l Fly	'nn	Hole Diameter (mm): 96	Date F	Revi	ew	red:2/10/2017		Re	view	ved E	Ву:			SH/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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
ground contributed from the Landau much and the contributed from the con			Vibracore	H-Casing C		SAND with GRAVEL: Dark brown, medium to coarse grained sand, Rounded to sub rounded gravel SAND, some SILT, trace GRAVEL: Fine to coarse grained sand, rounded to subrounded gravel SAND and COBBLES, with GRAVEL, some SILT: Light brown to grey, fine to course grained sand, rounded cobbles	Nf Nf	Rec				30	8	74	18				
1 2	38.5	4.5-		[4.6]															ļ
	38.0	5.0-			, , ,	To Target Depth. Drillhole BH16-R004 terminated at 4.6m.													

BOREHOLE REPORT

BH16-R005

Sheet 1 of 1

509,249.0 m

7,968,499.0 m

84.00 m

Easting: Client: **Baffinland Iron Mines** Project No.: H352034 Northing:

Project: Mary River Expansion Study Stage 2 Datum: NAD83

Location: Proposed Rail Alignment Platform: Ground **Bottom Elevation:** 79.43 m **Total Depth:** 4.6 m

Surface Elevation:

Date Logged: 10/6/2016 Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig Logged By: UK

Dr	iller:	Va	nce	Mad	lden	Hole Diameter (mm): 96	Date R	eviev	ved:2/10/2017	F	Revie	wed l	Ву:			SH/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	OO Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
Unobserved due to permafrost		0.5	Vibracore	H-Casing Ca		structure, accessory components. SAND and GRAVEL, some SILT: Fine to coarse grained sand, subangular gravel SAND, some SILT, trace GRAVEL: Fine to coarse grained sand, angular to subangular gravel	Nf Nbn	Reco		1		78	18	ΓΙΘ	Pla		
		3.5— 4.0— - 4.5—		[4.6]				×		1	0					-	
	79.0	- - - 5.0			R - G	To Target Depth. Drillhole BH16-R005 terminated at 4.6m.											

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25 Notes:

Contractor: Boart Longyear

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

BOREHOLE REPORT

BH16-R006

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 10/6/2016

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

Oriller	: '	Van	ce I	Mad	den	Hole Diameter (mm): 96	Date R	evie	we	ed:2/10/2017		Re	view	ed E	Зу:			SH/WH
1 6								_	_				_		<u> </u>	_		311/7/11
vvater Flevation (n	Depth (m)	()	Method		Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery Sample Type	Sample Lype	Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	8		Vibracore	H-Casing		SAND and GRAVEL, trace SILT: Coarse grained sand, angular gravel	Nf Nbn											-
	3 3					Drillhole BH16-R006 terminated at 2.9m.												-
	770	77.8	77.8 1.0- 1.00 pp	77.8 1.0	Dustried of ann payagoon 77.3 1.5—77.8 2.5—77.8 3.0—77.8 3.0—77.3 3.5—77.8 4.0—77.3 3.5—77.8 4.0—77.3 4.5—77.3	77.8 1.0	SAND: Organic, dark brown To Target Depth. To Target Depth. To Target Depth. Drillhole BH16-R006 terminated at 2.9m.	SAND: Organic, dark brown Nf SAND: Organic, dark brown Nf Nf SAND and GRAVEL, trace SILT: Coarse grained sand, angular gravel Ng SAND and GRAVEL, trace SILT: Coarse grained sand, angular gravel Ng SAND and GRAVEL, trace SILT: Coarse grained sand, angular gravel Ng Ng Ng Ng Ng Ng Ng Ng Ng N	SAND: Organic, dark brown Nf SAND: Organic, dark brown Nf SAND: Organic, dark brown Nf SAND: Organic, dark brown Nf SAND: Organic, dark brown Nf Nf Nf Nf SAND: Organic, dark brown Nf Nf Nf Nf Nf SAND: Organic, dark brown Nf Nf Nf Nf Nf Nf SAND: Organic, dark brown Nf Nf Nf Nf Nf Nf Nf SAND: Organic, dark brown Nf Nf Nf Nf Nf Nf SAND: Organic, dark brown Nf Nf Nf Nf Nf Nf SAND: Organic, dark brown Nf Nf Nf Nf Nf Nf Nf SAND: Organic, dark brown Nf Nf Nf Nf Nf Nf Nf Nf Nf N	SAND: Organic, dark brown Nf SAND: Organic, dark brown Nf SAND: Organic, dark brown Nf SAND: Organic, dark brown Nf SAND: Organic, dark brown Nf Nf SAND: Organic, dark brown Nf SAND: Organic, dark brown Nf Nf SAND: Organic, dark brown Nf Nf SAND: Organic, dark brown Nf Nf SAND: Organic, dark brown Nf Nf SAND: Organic, dark brown Nf Nf SAND: Organic, dark brown Nf SAND: O	SAND: Organic, dark brown Nf Nf Nf Nf Nf Nf Nf Nf Nf N	SAND: Organic, dark brown Sand S	SAND: Organic, dark brown SAND and GRAVEL, trace SILT: Coarse grained sand, angular gravel SAND and GRAVEL, trace SILT: Coarse grained sand, angular gravel Nhbn Nhbn Nhbn Nhbn To Target Depth. Drillhole BH16-R006 terminated at 2.9m.	SAND: Organic, dark brown Nf SAND and GRAVEL, trace SILT: Coarse grained sand, angular gravel SAND and GRAVEL, trace SILT: Coarse grained sand, angular gravel Nf Nh Nh Nh Nh Nh Nh Nh Nh Nh	SAND: Organic, dark brown SAND: Organic, dark brown Nf SAND: Organic, dark brown Nf SAND: Organic, dark brown Nf NF NF Coarse grained sand, angular gravel SAND: Organic, dark brown NF NF NF ND ND ND ND ND ND ND	SAND: Organic, dark brown Nf Nf SAND: Organic, dark brown Nf Nf SAND: Organic, dark brown Nf Nf SAND: Organic, dark brown Nf Nf Nf SAND: Organic, dark brown Nf Nf Nf SAND: Organic, dark brown Nf Nf Nf SAND: Organic, dark brown Nf Nf Nf SAND: Organic, dark brown Nf Nf Nf SAND: Organic, dark brown Nf Nf Nf Nf SAND: Organic, dark brown Nf Nf Nf Nf SAND: Organic, dark brown Nf Nf Nf Nf SAND: Organic, dark brown Nf Nf Nf SAND: Organic, dark brown Nf Nf SAND: Organic, dark brown Nf Nf SAND: Organic, dark brown Nf Nf SAND: Organic, dark brown Nf Nf SAND: Organic, dark brown Nf Nf SAND: Organic, dark brown Nf Nf Nf SAND: Organic, dark brown Nf Nf Nf SAND: Organic, dark brown Nf Nf Nf Nf Nf Nf Nf Nf Nf N	SAND: Organic, dark brown SAND: Organic, dark brown Nf SAND and GRAVEL, trace SILT: Coarse grained sand, angular gravel Nbn Nbn Ni Ni Ni Ni Ni Ni Ni Ni Ni N	SAND: Organic, dark brown SAND: Organic, dark brown Nf SAND: Organic, dark brown Nf SAND: Organic, dark brown Nf Nf Nf No No No No No No No

BOREHOLE REPORT

BH16-R007

Sheet 1 of 1

510,940.0 m

Easting: Client: **Baffinland Iron Mines** Project No.: H352034

Northing: 7,967,349.0 m Project: Mary River Expansion Study Stage 2 Datum: Surface Elevation: 83.00 m NAD83

Bottom Elevation: 78.43 m Location: Proposed Rail Alignment Platform: Ground **Total Depth:** 4.6 m

Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig Date Logged: 10/6/2016 Logged By: UK

	Com	racio	or: Bo	ant	ong	year	RIG Type/ Mounting: MiniSonic Rig	Date L	.ogge	a:	10/6/2016		LO	gge	Ву	:			UK
L	Drille	er:	Va	nce	Mad	lden	Hole Diameter (mm): 96	Date F	Revie	we	ed:2/10/2017		Re	view	ed E	Зу:			SH/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	Sample Lype	Moisture Content Profile	00	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	-	-82.5 -82.0	0.5=				SAND, some GRAVEL, some SILT: Reddish brown, fine to coarse grained sand, angular to subangular gravel	Nf	}	3									- - - - - - - - - - - - - - - - - - -
REV 3.GPJ << Drawnightee>> 15/08/2017 11.23	Unobserved du	-81.5 81.0	1.5= - - 2.0- - - - 2.5- - - - 3.0-	Vibracore	H-Casing		SAND, some SILT, trace Gravel: Grey, fine grained to coarse grained sand, angular to subangular gravel	Nbn		3			13	1	87	13			- - - - - - - - - - - - - - - - - - -
	-	-79.5	3.5—				SAND, with GRAVEL: Grey, fine to coarse grained sand, angular to subanbgular gravel GRAVEL: Coarse, angular to	Nf Nf											- - - - - -
SED LOG ICE BONEHOLE MAIL AL	- - -	-79.0 -78.5	4.0		[4.6]		subangular						10						- - - - - - -
D. I NAVIGUA I INDI CANA	-	- 78.0	5.0				To Target Depth. Drillhole BH16-R007 terminated at 4.6m.												

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25 Notes:

BAFFINLAND GINT LIBRARY.GLB. Log. ICE BOREHOLE. RAIL ALIGNMENT ALL_WITH ICE LOG_REV.3.GPJ. <

-CDrawingFile>> 13:09/2017 11:25

BOREHOLE REPORT

BH16-R008

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

NAD83

Platform: Ground

Datum:

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

	Coi	ntract	or: Bo	art I	ona	ıvear	Rig Type/ Mounting: MiniSonic Rig	Date L	oaa	ed:	: 10/7/2016	1	otal [ogge	-				4.6 m MR
		ler:		mue	_	-	Hole Diameter (mm): 96				ed:2/10/2017		eviev	-				SH/WH
	Water	Elevation (m)	Depth (m)	Method	Casing	Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil		e I ype	Moisture Content Profile 0 50 100	Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	to Permafrost						SAND with GRAVEL: Medium to coarse grained sand, fine to coarse gravel, light brown, subangular to angular	Nf		×								- - - - - - - - - - - - - - - - - - -
3.GFJ < <diawiiigfiie< td="">10/109/2011 11.20</diawiiigfiie<>	Unobserved due to Permafrost		1.5—				SAND with GRAVEL, trace COBBLES: Light brown to grey, coarse grained sand, fine to coarse gravel, rounded to subangular gravel	Nf		<u> </u>								- - - - - - - - - - - - - -
TOLE TAIL ALIGNIMENT ALL WITH TOE LOG NE			3.0-				SAND and GRAVEL, some COBBLES: Light brown, fine to coarse grained sand, fine to coarse gravel, rounded to subrounded	Nf										- - - - - - - -
TI TIERRAN I GEB LOY INC. DOINEIL			4.5				To Target Depth. Drillhole BH16-R008 terminated at 4.6m.											-
Š	Note	es:																

Location:

BOREHOLE REPORT

BH16-R009

Easting:

Northing:

Surface Elevation:

Sheet 1 of 1

514,367.0 m

7,965,535.0 m

79.00 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project: Mary River Expansion Study Stage 2

Datum: NAD83

Proposed Rail Alignment

Platform: Ground **Bottom Elevation:** 74.43 m

Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig

Total Depth: 4.6 m

Date Logged: 10/8/2016 Logged By: MR Driller: Samuel Flynn Date Reviewed: 2/10/2017 Reviewed Bv: Hole Diameter (mm): 96 SH/WH

D	riller:	Sa	mue	l Fly	/nn	Hole Diameter (mm): 96	Date F	Revi	ew	ed:2/10/2017	Re	eviev	ved I	Ву:			SH/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
	- - - -78.5	0.5—				SAND: Organics, dark brown SAND, some GRAVEL: Light brown, fine to coarse grained sand, rounded to subrounded gravel	Nf										
Unobserved due to Permafrost		1.0-							X		23						- - - - - -
Unobserved du	- - - - -77.0	2.0-				SILTY SANDY GRAVEL, with COBBLES: Medium to coarse grained sand, rounded to subrounded cobbles	Nbn	3	X								- - - - - -
		2.5— ———————————————————————————————————															- - - - - - - -
	- - - - -75.5	3.5-				SILTY SANDY GRAVEL, some COBBLES: Light brown, fine to coarse grained sand, fine to coarse gravel, rounded to subrounded cobbles	Nf										- - - - -
		4.0— ———————————————————————————————————						,	X								
	74.0	- - - 5.0-				To Target Depth. Drillhole BH16-R009 terminated at 4.6m.											-

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25 Notes:

BOREHOLE REPORT

BH16-R010

Sheet 1 of 1

515,332.0 m

80.00 m

Easting: Client: **Baffinland Iron Mines** Project No.: H352034

Northing: 7,963,810.0 m Project: Mary River Expansion Study Stage 2 Datum: Surface Elevation: NAD83

Bottom Elevation: 75.43 m Location: Proposed Rail Alignment Platform: Ground **Total Depth:** 4.6 m

Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig Date Logged: 10/8/2016 Logged By: UK

				-	,	3 . 7 , F33 .		55					99-1	,				OK	
Di	riller:	Va	nce	Mad	lden	Hole Diameter (mm): 96	Date F	evi	ew	red:2/10/2017		-	view	ed E	By:			SH/WH	4
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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
Unobserved due to Permafrost	- - - -79.5 - - -					1.50 m to 2.50 m: Some silt 2.50 m to 4.00 m: Sand with some gravel	Nf												
	75.0	- - - 5.0-				To Target Depth. Drillhole BH16-R010 terminated at 4.6m.													-

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25 Notes:

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11.25

Notes:

BOREHOLE REPORT

BH16-R011

Sheet 1 of 1

516,719.0 m

Easting: Client: **Baffinland Iron Mines** Project No.: H352034 Northing: 7,962,461.0 m

Project: Mary River Expansion Study Stage 2 Datum: NAD83

Location: Proposed Rail Alignment Platform: Ground

Ria Type/ Mounting: MiniSonic Ria

Surface Elevation: 94.70 m **Bottom Elevation:** 90.13 m

Total Depth: 4.6 m

C	ontract	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ged	1: 10/8/2016	Lo	ogge	d By	:			UK	
Di	riller:	Va	nce	Mad	lden	Hole Diameter (mm): 96	Date F	levi	ew	red: 2/10/2017	R	eviev	ved I	Зу:			SH/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	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
Unobserved due to Permafrost						SAND, some SILT: Brown, fine to coarse grained sand GRANITE: Pinkish brown, 75 mm, pieces of granite in frozen sand	Nf Nf				19		86	14				
	89.7	- - - 5.0-				Drilling Refusal. Drillhole BH16-R011 terminated at 4.6m.												

BOREHOLE REPORT

BH16-R012

Easting:

Bottom Elevation:

Sheet 1 of 1

516,716.0 m

7,962,464.0 m

106.75 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

Northing: Surface Elevation: NAD83

Location:

Proposed Rail Alignment

Platform: Ground

Datum:

102.75 m

Ria Type/ Mounting: MiniSonic Ria

Total Depth: 4.0 m

	Con	tracto	or: Bo	art L	ong	ıyear	Rig Type/ Mounting: MiniSonic Rig	Date L	.ogge	ed:	10/8/2016		Lo	gge	d By	:			UK
L	Dril	er:	Va	nce	Mad	dden	Hole Diameter (mm): 96	Date F	Revie	we	ed:2/10/2017		Re	viev	ved I	Зу:			SH/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	odi pio	Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
		-106.3	- - - 0.5- -				SAND, some GRAVEL, some COBBLES: Brown, well graded, subangular to angular gravel												
	to Permafrost	-105.8	1.0—				SAND, some SILT, trace GRAVEL: Brown, loose, angular to subangular gravel	Nf	>										-
13/03/2017 11:23	Unobserved due to Permafrost	-105.3 -104.8	1.5-				1.50 m to 3.00 m: Greyish brown, fragmented rock pieces	Nf											
יר בססביים מיינים איזיים מיינים איזיים מיינים איזיים מיינים איזיים מיינים איזיים מיינים איזיים מיינים איזיים מ		-104.3 -103.8	2.5- - - - - - - 3.0-				SAND and GRAVEL: Brown, angular to subangular gravel	Nbn					10	1	81	18			
CALCALIGRAMENT ALL WITH IC		-103.3 -102.8	3.5—																
GIN LIBRAN LOLD LOG TOL DOTTETTOL		-102.8 -102.3	4.5— - 4.5— -				Drilling Refusal. Drillhole BH16-R012 terminated at 4.0m.												
}	Note	- 101.8	5.0-			<u> </u>	<u> </u>			_					<u> </u>				

BAFFINLAND GINT LIBRARY.GLB. Log. ICE BOREHOLE. RAIL ALIGNMENT ALL_WITH ICE LOG_REV.3.GPJ. <

-CDrawingFile>> 13:09/2017 11:25

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

BOREHOLE REPORT

BH16-R013

Easting:

Surface Elevation:

Sheet 1 of 1

518,856.0 m

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground Northing: 7,959,178.0 m

107.00 m **Bottom Elevation:** 102.43 m

Total Depth: 4.6 m Logged By: UK

	Co	ntract	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ed:	10/8/2016		l		d By:				4.6 m UK
	Dri	ller:	Va	ince	Mad	dden	Hole Diameter (mm): 96	Date R	evie	ewe	ed:2/10/2017		Re	viev	ved E	Зу:			SH/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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	oermafrost		0.5-				SAND, trace GRAVEL: Brown, well graded, angular to subangular gravel			X									-
13/09/2017 11:25	Unobserved due to permafrost		- 1.5- - - - - - 2.0- -				SAND, with GRAVEL: Brown, rounded to subangular gravel	Nbn											-
THE LOG NEW SOLD AND AWARDENIES.		- 	- 2.5- - - - - 3.0- -				SAND, some SILT: Brown to grey, fine grained sand	Nbn	K				16	0	85	15			-
LOG TOE BONEHOLE MAIL ALIGINMENT ALL_VIII		- 103.5 103.0 	3.5— 4.0—				Possible GRANITE: Dark grey streaks, dense			X			16						-
II SINI CIBRANT GEB	Note		4.5- - - - - 5.0-			+ + + +	Drilling Refusal. Drillhole BH16-R013 terminated at 4.6m.	_											

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-R014

Easting:

Sheet 1 of 1

519,701.0 m

Client: Baffinland Iron Mines Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

•

NAD83

Platform: Ground

Date Logged: 10/8/2016

Datum:

 Northing:
 7,957,349.0 m

 Surface Elevation:
 111.00 m

Bottom Elevation: 106.50 m

Total Depth: 4.5 m Logged By: MR

Ι,	JON.	tracto	or: Bo	art L	Long	year	RIG Type/ Mounting: MINISONIC RIG	Date L	ogge	ea.	: 10/8/2016		Log	geo	I By:				MR
1	Orill	er:	Sa	mue	el Fly	/nn	Hole Diameter (mm): 96	Date F	evie	we	ed:2/10/2017	\perp	Rev	iew	ed E	Зу:			SH/WH
10/0401	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	Sample Lype	Moisture Content Profile 0 50 10	0	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	-		- - -				SILTY SAND: Fine grained	Nf											
	-	-110.5	0.5 - - -				Silty SAND, with GRAVEL, trace COBBLES: Fine gravel, fine to coarse grained sand	Nf	Σ	3									- !
(2)		-110.0 -109.5	1.0- - - - 1.5-																
02:11 CONTRACT		-109.0	- - - 2.0-				Silty SAND, trace GRAVEL: Subangular to angular gravel, medium to coarse grained sand	Nf					11 -	11	69	20			
awiigi iero	-	-108.5	- - - 2.5-						2										-
	-	-108.0	3.0-																-
	-	-107.5	3.5—																-
רטק וטב פטוירווטרר י	-	-107.0	4.0— — — —				Sandy GRAVEL, trace COBBLES: Pinkish grey to light brown, coarse grained sand, rounded to subrounded gravel	Nf	K	K									
ו בופראיו : כבנ	-	-106.5	4.5 				To Target Depth. Drillhole BH16-R014 terminated at 4.5m.												
5		- _{106.0}	5.0									\perp							
			0.0									_							

BAFFINLAND GINT LIBRARY,GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

Notes:

BOREHOLE REPORT

BH16-R015

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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

(ont	racto	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ged	: 10/8/2016	1	ogge	-				4.5 m MR	
[Prille	er:	Sa	ımue	l Fly	'nn	Hole Diameter (mm): 96	Date R	levi	ew	ed:2/10/2017	Re	eview	ved E	Зу:			SH/WH	
Wotor.	Vale	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	
N Indicate the management of the first of the state of th		114.5 114.0 113.5 1112.0 111.5 111.0	1.0				GRAVEL with SAND, trace SILT, trace COBBLES: Light brown, fine to coarse gravel, rounded, fine to coarse gravel, rounded, fine to medium grained sand, poorly bonded SAND with SILT, trace GRAVEL: Light brown, fine to medium grained sand, fine gravel	Nf Nf	Re	us V		13	2	73	24				
	- - - -	110.5					To Target Depth. Drillhole BH16-R015 terminated at 4.5m.												- - - - -

Contractor: Boart Longyear

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11.25

Notes:

BOREHOLE REPORT

BH16-R016

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 10/8/2016

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

"	Jilliact	01. D0	uit L	-0119	ycui	rig Type/ Mounting. Willingonic rig	Date L	oge	Ju	и.	10/0/2010	-	ogge	шБу				MR
Dr	iller:	Sa	mue	el Fly	/nn	Hole Diameter (mm): 96	Date F	evi	ew	/ec	! :2/10/2017	R	evie	wed I	Ву:			SH/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	0	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	-	_			7 7 7 7 7 1 3 1 1	SAND: Organic, dark grey				П								-
	- - - 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											-
Ļ	-	1.0-						*		1		32						-
Permafrost	- - -	- - -							X]		32						-
Unobserved due to		1.5-					Nbe											
Onobse	- - 110.0	2.0-				SAND, with GRAVEL, trace SILT: Fine	Nbe	*	X			15	8	55	28			-
	- - 109.5	2.5-				to coarse grained sand, fine to coarse gravel, rounded												-
	- - 109.0	3.0-																-
	- - 108.5 -	3.5-																-
	- - 108.0 -	- 4.0- -						Š	X									-
	-	-																-
	107.5—	-4.5 - - -				To Target Depth. Drillhole BH16-R016 terminated at 4.5m.												-
_	107.0	5.0-									<u>i i i </u>							

BOREHOLE REPORT

BH16-R017

Sheet 1 of 1

115.00 m

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment Datum: NAD83

Platform: Ground Easting: 521,737.0 m Northing: 7,952,929.0 m

Bottom Elevation: 110.40 m

Surface Elevation:

Total Depth: 4.6 m

Contra	ctor:	Boa	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ged:	10/9/2016	L	ogge	d By	:			UK
Driller	:	Var	ice I	Mad	lden	Hole Diameter (mm): 96	Date R	evi	ewe	ed: 2/10/2017	R	eviev	ved I	Зу:			SH/WH
Water Elevation (m)	Denth (m)	Deptili (III)	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	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Jnobserved due to permafrost.	1.5	0.5-	Vibraone	H-Casing		SILTY SAND and GRAVEL: Brown, fine to coarse grained sand	Nf	2			29						
-	0.0	5.0		0]	⊥i '/A'¹ai	To Target Depth. Drillhole BH16-R017 terminated at 4.6m.											-

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

BAFFINLAND GINT LIBRARY GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile> 13.092017 11.25

Notes:

BOREHOLE REPORT

BH16-R018

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Ground

Platform:

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

	Con		. w. Do	ort I	000		Dia Tomal Mauntines MiniConia Dia	Doto I			10/0/2016		tal D	-				4.6 m	
			or: Bo		_	-	Rig Type/ Mounting: MiniSonic Rig		-		ed: 10/9/2016		gged	-				UK	
-	Drill	er:	Va	nce	Mad	lden	Hole Diameter (mm): 96	Date R	evi	ew	wed:2/10/2017		view	ed E	By:			SH/WH	1
	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	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
	Unobserved due to permafrost.	-112.5 -112.0 -111.5 -111.0		Vibracore	H-Casing (Casing	SILTY SAND, some Gravel: Brown, fine gravel, rounded to subangular gravel SILTY SAND with GRAVEL: Grey, fine sand, fine to coarse gravel, rounded to subrounded 2.40 m to 3.00 m: Gravel is fine to coarse, well bonded (Nbn) 3.00 m to 3.90 m: Brown to grey, Subangular gravel, fine to coarse SILTY SAND and BOULDERS: Crushed, grey with white stratification	Nf Nbn	Re	es S										
1		-108.5	4.5-		[4.6]		To Target Depth.											-	Ŧ
	F		-				Drillhole BH16-R018 terminated at 4.6m.												F
;		-108 O	5.0-				-												1
F		- 100.0_ '	5.0							_									f

BOREHOLE REPORT

BH16-R019

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2 Datum:

Location: Proposed Rail Alignment

NAD83

Platform: Ground Easting: 521,994.0 m Northing: 7,950,962.0 m

Surface Elevation: 112.30 m **Bottom Elevation:** 107.70 m

	Co	ntracto	or: Bo	art L	ong.	vear	Rig Type/ Mounting: MiniSonic Rig	Date L			10/9/2016		otal E	-				4.6 m UK	
		ller:			_	lden	Hole Diameter (mm): 96				ed:2/10/2017		eview					SH/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 I ype	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	•
•		- - - - 111.8	 0.5 -				SILTY SAND, with GRAVEL, trace COBBLES: Brown, rounded to subangular gravel, well graded	Nf	<u>«</u>	6								-	-
	to permafrost.	- 	1.0— — — —				GRAVEL and SAND: Brown, rounded to subround gravel	Nf	}									-	- - - -
5717 710	Unobserved due to permafrost.	—110.8 — — — — —110.3	1.5— — — — — 2.0—		1		SAND,with GRAVEL, with COBBLES: Brown, rounded to subangular gravel	Nf										-	- - - -
v s.gp. skulawiigriiezz is/08/z		 109.8 	2.5— ———————————————————————————————————	Vibracore	H-Casing		SILTY SAND with GRAVEL: Brown, rounded to subangular gravel, fragmented rock	Nf										-	
ALL_WITH ICE LUG_RE		—109.3 — — — — —108.8	3.0-				3.00 m to 4.00 m: Grey	Nbn										-	- - - - -
GLB Log ICE BUREHULE RAIL ALIGINILINI			4.0-		[4.6]		4.00 m to 4.60 m: Some cobbles	Nf										-	
ID GIN I LIBRART		- - - - 107.3	- - 5.0-				To Target Depth. Drillhole BH16-R019 terminated at 4.6m.												-
Ś	Note	es:																	Γ

BAFFINIAND GINT LIBRARY GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25 Notes:

BOREHOLE REPORT

BH16-R020

Sheet 1 of 1

521,842.0 m

7,949,969.0 m

112.90 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Surface Elevation: 117.50 m

Easting:

Northing:

Bottom Elevation:

Location:

Proposed Rail Alignment

Platform: Ground

4.6 m

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Drillhole BH16-R020 terminated at

Datum:

Total Depth:

Date Logged: 10/9/2016 Logged By: UK Driller: Hole Diameter (mm): 96 Date Reviewed: 2/10/2017 Vance Madden Reviewed By: SH/WH Elevation (m) Field Water Conten Soil Description Graphic Log $\widehat{\Xi}$ Moisture Percent Sand Other Method ype Liquid Limit Casing TYPE; plasticity or particle characteristics Content Profile Depth (Frozen Soil **Tests** Water (size, grading, shape, roundness), colour, structure, accessory components. Description Sample. 0 50 100 SAND and GRAVEL, some SILT, some Nf COBBLES: Brown, angular to subangular gravel -117.0 Unobserved due to permafrost. -116.0 SILTY SAND, with GRAVEL, with Nf COBBLES: White to grey, angular to subangular gravel, crushed rock -115.5 2.0-Vibracore H-Casing 3.0-SILT and SAND: Brown to grey, angular Nbn to subangular gravel -114.0 3.5 -113.5 4.0-0 57 43 --113.0 4.5 [4.6] To Target Depth.

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG REV 3.GPJ «CDrawingFile» 13/09/2017 11:25

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

BOREHOLE REPORT

BH16-R021

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

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

0	on	tracto	or: Bo	art L	_ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ed:	10/9/2016				epu I By:				4.5 m MR	
	rill	er:	Sa	mue	el Fly	/nn	Hole Diameter (mm): 96	Date R	evie	we	ed:2/10/2017		Rev	riew	ed E	By:			SH/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 I ype	Moisture Content Profile 0 50 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
		-122.8	- - - 0.5- -				SILTY SAND, some GRAVEL, trace COBBLES: Light brown to grey, fine to medium grained sand, fine to coarse gravel, rounded to subangular	Nf											-	
Inobserved due to permetrost		-122.3 -121.8	- 1.0- - - - - 1.5-																-	
povaoshoul		-121.3	2.0-	Vibracore	H-Casing		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 -120.3	2.5— — — — — 3.0—				SILTY SAND, some GRAVEL: Light	Nf	<										-	
	- - - -	-119.8	- - 3.5- - -				brown to reddish brown, fine to medium grained sand, fine gravel, rounded	· ·											-	
	-	-119.3	4.0- - - - - - - -		[4.5]														-	
	 - - -	-110.0	- - - -				To Target Depth. Drillhole BH16-R021 terminated at 4.5m.													
N	otes	<u>-118.3</u> 3:	5.0	•	•			•			· · ·									F

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-R022

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 10/9/2016

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

	Co	ntracto	or: Bo	an L	.ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	.ogge	ea:	10/9/2016	[ogge	a By	:			MR
L	Dri	ller:	Sa	mue	l Fly	/nn	Hole Diameter (mm): 96	Date F	Revie	we	d:2/10/2017	R	eviev	ved	Ву:			SH/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	odific odino	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
		- - - - 140.9	0.5—				SILTY SAND and GRAVEL, trace COBBLES: Grey to light brown, angular to subangular gravel, fine to coarse,rounded to subrounded, coarse grained sand	Nf										
	permafrost.	- - 140.4 - -	1.0-															-
1.23	Unobserved due to permafrost.		1.5— - - - - 2.0—															-
Diawiighii6// 10/00/2011			2.0— — — — — — —	Vibracore	H-Casing													
IN ICE LOG NEV 3.GF3 VV		- - 138.4 - -	3.0-				SILT and SAND, some GRAVEL: TILL, grey, fine to coarse grained sand, fine to coarse gravel, rounded to subangular	Nbn										-
AL ALIGINIEN ALL_VII			3.5— — — —															-
ו רסן וכב פטאבווטרר יי		—137.4 — — — —	4.0-		[4.5]						•	9	13	44	44			
GIIN I LIBRART.GLE							To Target Depth. Drillhole BH16-R022 terminated at 4.5m.											
}		136.4	5.0		<u> </u>	I		1		_		-						

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

BAFFINIAND GINT LIBRARY GLB Log ICE BOREHOLE RAIL ALIGNIMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13.09/2017 11.25

BOREHOLE REPORT

BH16-R023

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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

	_		_											Deptl				4.0 m	
	Cor	tracte	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ged:	: 10/10/2016	Lo	gge	d By	:			MR	
	Dril	ler:	Sa	mue	l Fly	nn	Hole Diameter (mm): 96	Date F	levi	ewe	ed:2/10/2017	Re	viev	ved I	Зу:			SH/WH	1
	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	
oin I Library (Jolb Log Ice Borehole, Rail Alignmen I All, With Ice Log, Key 3, GF) < Chraming Files>> 13/03/2017 11:29	Unobserved due to Permaffrost				H-Casing		SILTY SAND, some GRAVEL: Light brown, fine to medium grained sand, coarse gravel, rounded to subrounded SAND and SILT: Grey, fine to medium grained Drilling Refusal. Drillhole BH16-R023 terminated at 4.0m.	Nbn					0	61	39				
HINLAINU	Note	-153.0 S:	5.0-					<u> </u>			1 1 1								‡

BOREHOLE REPORT

BH16-R024

Easting:

Northing:

Surface Elevation:

Bottom Elevation:

Sheet 1 of 1

522,558.0 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Location:

Proposed Rail Alignment

Datum:

7,946,129.0 m 153.00 m 148.40 m

Platform: Ground

4.6 m

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/10/2016

Total Depth: Logged By: UK

Drill	er:	Va	ance	Mad	den	Hole Diameter (mm): 96	Date F	Rev	iew	ed:2/10/2017	R	eviev	ved E	Зу:			SH/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
Unobserved due to Permafrost	152.5 152.0			бı		SILTY SAND and GRAVEL: Brown, angular to subangular gravel	Nf				9	30	38	32			-

Nbn

To Target Depth.

3.0-

3.5

Drillhole BH16-R024 terminated at

Notes:

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11.25

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

Contract	or: Bo	oart L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	.og	ged	1: 10/10/2016			otal [ogge	-				4.6 U
riller:	Va	ance	Mad	lden	Hole Diameter (mm): 96	Date F	Revi	ew	ed:2/10/2017		_	eviev	ved I	Зу:			SH/W
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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Tes
- 153.3 - 153.3 - 152.8 - 152.8 - 152.8	0.5-				SANDY SILT, some GRAVEL, trace COBBLES: Grey, angular to subabgular gravel	Nf		X			18	13	33	54			
- 152.3 	1.5-		H-Casing			Nbn											
- 151.3 - - - - 150.8	2.5-)-H			Vx					15	16	43	41			
- 150.3 - - - - - 149.8	3.5-	-						\times			16						
- - 149.3	4.5-		[4.6]		To Target Depth. Drillhole BH16-R025 terminated at 4.6m.												

Project:

BOREHOLE REPORT

BH16-R026

Sheet 1 of 1

Client: **Baffinland Iron Mines**

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

Coı	ntracto	or: Bo	art I	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date I	_og	ged	: 10	/10/2016		Lo	gge	d By	:			Uł
Dril	ller:	Va	nce	Mac	lden	Hole Diameter (mm): 96	Date I	Rev	iew	ed:2/1	10/2017		-	viev	ved I	Зу:			SH/WF
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	Cc	Moisture ontent Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Test
	- - -	-			0.00	SAND with GRAVEL, trace SILT: Grey, granular, organics	Nf												
Permafrost	- 151.5 - -	0.5 - - -				SILTY SAND, wtih GRAVEL: Brown, rounded to subangular GRAVEL	Nf												
유	- 151.0 	- 1.0- -				0.90 m to 3.00 m : Fragmented rock			X				27						
Unobserved due	- 150.5 	1.5- -																	
	- - 150.0 	2.0-	core	H-Casing															
	- - 149.5 - -	- 2.5- -	Vibracore	H-C															
-	- - 149.0 -	3.0-					Nbn												
	- 148.5 	3.5-																	
	- - 148.0 -	4.0-							X	•			8						
	- - 147.5	4.5-		[4.6]															
-	- - - 	5.0-				To Target Depth. Drillhole BH16-R026 terminated at 4.6m.													
Vote		5.0=							_										

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-R027

Easting:

Sheet 1 of 1

523,442.0 m

Client: Baffinland Iron Mines Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

,

NAD83

Platform: Ground

Datum:

Date Logged: 10/10/2016

 Northing:
 7,942,265.0 m

 Surface Elevation:
 171.10 m

Bottom Elevation: 166.50 m

Total Depth: 4.6 m Logged By: UK

Contract	(or : B0	art L	.ong	year	RIG Type/ Mounting: MiniSonic Rig	Date L	.ogg	jea:	10/10/2016	L	ogge	а ву	:			UK
Driller:	Va	nce	Mad	lden	Hole Diameter (mm): 96	Date F	Revie	ewe	ed:2/10/2017	R	eview	ved E	Зу:			SH/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
- 170.6 - 170.6 - 170.6 - 170.6 - 170.6 - 169.6 - 169.6 - 169.1 - 168.6 - 168.	1.0- -		H-Casing Cas	Gre	structure, accessory components. SAND, with SILT, with COBBLES: Brown, rounded to subrounded cobbles 0.45 m to 1.10 m: Crushed limestone cobbles and boulders SAND and SILT, with GRAVEL: Brown 1.50 m to 3.00 m: Inferred rock/cobbles, fragmented, cobbles rounded to angular SILTY SAND, with GRAVEL, with COBBLES: Brown, rounded to subangular gravel	Nf Nf Nbn		ldmeS X	0 50 100	S S S S S S S S S S S S S S S S S S S	222	JJBd 43	35 35	Liqu	Se d	
——————————————————————————————————————	4.5-		[4.6]		To Target Depth.			_								_
-	-				Drillhole BH16-R027 terminated at 4.6m.											
166.1	5.0						_	_		_	-		_	=		

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11.25

Contractor: Boart Longyear

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11.25

BOREHOLE REPORT

BH16-R028

Sheet 1 of 1

Client: **Baffinland Iron Mines**

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment Project No.: H352034

Datum: NAD83

Platform: Ground

Date Logged: 10/10/2016

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

					J.	,	5 3.		5.					55-	,				IVIIX
1	Oriller	: _	Sa	mue	l Fly	nn	Hole Diameter (mm): 96	Date F	Revi	ew	ved:2/10/2017		Re	view	ved E	Зу:			SH/WH
10,040,11	water Flevation (m)	Elevation (III)	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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	- - - -	1.8	- 0.5-				SAND and SILT, some GRAVEL: Light grey,fine to coarse grained sand, angular to subangular gravel	Nf											
+ C C C C C		1.3	- - - 1.0-						,	X			3						
70000		0.8	1.5—				Gravelly Silty SAND: Grey, dark grey mixed, fine to coarse grained sand, fine to coarse gravel, rounded to subrounded	Nf											
19/2017 11:25	- - - -17	70.3	2.0-	Vibracore	H-Casing				9	X									
o soliawingrijest isk	_ _ 16	9.8	- 2.5- -																
WITH ICE LOG REV 3.GF	——16 ——	9.3	3.0-				SANDY SILT, with GRAVEL, with COBBLES: Fine to medium grained sand, fine to coarse gravel, rounded to subrounded	Nf	3	X									
ALL.	-16	8.8	3.5-		[3.6]														
E KAIL ALIGNMEN	-	88.3	- - 4.0-			e, 19,1	Drilling Refusal. Drillhole BH16-R028 terminated at 3.6m.												
LOG ICE BUREHULE	-		-																
NI LIBRARY.GLB L		67.8	4.5— — —																
		7.3	5.0																
N	lotes:																		

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-R029

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

NAD83

Platform: Ground

Datum:

Date Logged: 10/11/2016

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

			orig		Rig Type/ Mounting. Willingonic rag		- 5	900		10/11/2010			55	л Бу				MF
Driller:	Sa	mue	l Fly	nn	Hole Diameter (mm): 96	Date F	Revi	iew	ec	d :2/10/2017			view	ed E	Зу:			SH/WF
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	0	Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Test
- 185.5 185.0 184.5	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												
184.5 - - - - - - - - - - - - - - - - - - -	1.5— 2.0— 2.5—	Vibra	H-C		GRAVEL and COBBLES, some SAND: Grey, subgranular to angular gravel, fine to coarse, fine to coarse grained sand	Nf		X										
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— — — —																	

HATCH LIBRARY DEVELOPMENT COPY GLB Log ICE BOREHOLE BAFFINLAND BOREHOLES_REV 1.GPJ <<DrawingFile>> 29/08/2018 11:41

BOREHOLE REPORT

BH16-R030

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Datum: NAD83

Location: Mary River 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

1	Contra	acto	r: Bo	art l	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ge	d: 10/11/2016	Lo	ogge	d By	:			UK
L	Driller	:	Va	nce	Mac	lden	Hole Diameter (mm): 96	Date R	evi	ev	ved:2/10/2017	R	eviev	ved I	Ву:			SH/WH
3	water	evalion (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour,	Frozen Soil Description	Recovery	Sample Type	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
3	\$ <u> </u>		ă	Ž	Ö	Ō	structure, accessory components.		Rec	Sam		ij	Pe	Pe	Pe	Ę	ä	
100		'8.3	0.5				SAND with SILT, with GRAVEL: Brown, angular to subangular gravel	Nf										- - - -
		7.8	- - - 1.0-				SANDY SILT, with GRAVEL, with COBBLES: Grey, angular to subangular gravel	Nf	,	X								- - - -
-		77.3	- - 1.5-	ė	g					X								- - - - -
11.000000000000000000000000000000000000	- - - - 17	6.8	2.0-	Vibracore	H-Casing		Pulverized rock with fragments of rocks, angular, sharp edges	Nf										- - - - -
	- - 17	6.3	2.5—						s s	X		10						- - - -
	- - - - -	5.8	3.0-															- - - - -
	17	5.3	3.5-		[3.6]					\langle								+
:	- - - -17	4.8	4.0-				Drilling Refusal. Drillhole BH16-R030 terminated at 3.6m.											-
	- - - - - -	4.3	4.5— — — —															
 -	lotes:	3.8	5.0	<u> </u>								_						

BOREHOLE REPORT

BH16-R032

Sheet 1 of 1

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Surface Elevation:

Easting:

Northing:

525,991.0 m 7,936,109.0 m

168.75 m

Location: Proposed Rail Alignment

Platform: Ground

Datum:

Bottom Elevation: 166.05 m **Total Depth:**

2.7 m

Contrac				-	Rig Type/ Mounting: MiniSonic Rig					11/2016			Lo	gge	d By	:			UI
Water Elevation (m)		Method		Graphic Log lab	Hole Diameter (mm): 96 Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour,	Frozen Soil		Sample Type	Cor	Moistur ntent Pi	rofile		Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	SH/W Othe Test
Unobserved due to Permafrost Water	0.5-		Cag	319	structure, accessory components. SILTY SAND, some GRAVEL, some COBBLES: Brown to grey, fine to coarse grained sand		Recovery	Samp	0	50		100	Field	Per	Perc	Perc	Liqu	Plas	
98 - 167.3 - 167.3 - 166.8		-	H-Casing		LIMESTONE: Pulverized rock, white to grey, angular rock fragments, weak to moderate strength	_		\boxtimes											
- 			[2.7]		Drilling Refusal. Drillhole BH16-R032 terminated at 2.7m.						 								
- - 165.3 - -	3.5-									 									

BOREHOLE REPORT

BH16-R033

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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:

Dril			ance	T		Hole Diameter (mm): 96	1	Ė	T	T	d:2/10/2017	+	Ť	wed	Ť	T		SH/WF
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	C	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Tests
Unobserved due to Permafrost						sand, subrounded to rounded gravel SAND and GRAVEL, with SILT, trace COBBLES: Grey, fine to coarse gravel,	Nf Nf		X									
		2.0- - - - - 2.5- - - - -	Vibrac	H-Casing		subrounded gravel	Nif.		X			7						
-		3.5		[4.2]			Nf		X	7								
- - - -	- 159.5 	 4.5- - - - - 5.0-				To Target Depth. Drillhole BH16-R033 terminated at 4.2m.												

BOREHOLE REPORT

BH16-R034

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Drillhole BH16-R034 terminated at

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 10/12/2016

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

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

	Oriller	r:	Sa	mue	l Fly	nn	Hole Diameter (mm): 96	Date R	evie	ved:2/1	0/2017	F	Revie	wed	Ву:			SH/WH	
Wotor.	vvater	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	Co	Moisture ontent Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
Hoopserved due to Dermefroet	- 110 DO DO DO DO DO DO DO DO DO DO DO DO DO	75.1	0.5				SAND and GRAVEL, trace silt: Light brown, grey mixed, fine to coarse grained sand, rounded	Nf										-	
11.23	- 17 - -	74.1	1.5—	ore	sing		GRAVELLY SILTY SAND: Light brown, grey mixed, angular to subangular gravel, fine to coarse grained sand	Vx										-	
LOG NEV 3.613 NO IMMINISTREY 1903	-	73.1	- 2.5- - - - - 3.0-	Vibracore	H-Casing							8	3 27	40	32			-	
ENOLE PAIL ALIGINMENT ALL_WITH TOE	-	72.1	3.5									g	•					-	
KAKY.GLB LOG ICE BURE	- - - - - -	71.1	- - 4.5- -		[4.5]	000000000000000000000000000000000000000	To Target Depth.												- - - -

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25 Notes:

BOREHOLE REPORT

BH16-R035

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: 527,423.0 m

Northing: 7,932,310.0 m Surface Elevation: 186.00 m

Bottom Elevation: 181.40 m

Total Depth: 4.6 m

	Con		ew Do	ort I	000	voor	Die Tyme/ Mayuntines, MiniCania Die	Dete I		al.	10/12/2016	1		Depti				4.6 m
			or: Bo		_	-	Rig Type/ Mounting: MiniSonic Rig		-		: 10/12/2016			d By				UK
ŀ	Dril		Va	ince	Mac	lden	Hole Diameter (mm): 96	Date R	levi	ewe	ed:2/10/2017		view	ved E	3y: □			SH/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
			0.5-				SAND, with GRAVEL, with SILT: Grey to brown, angular to subangular gravel GRAVEL, with SAND, with COBBLES:	Nf Nf										-
	Unobserved	—185.0	- 1.0- - -				SAND and GRAVEL, some SILT: Grey, fine grained sand	Nf		X								-
		—184.5	1.5- - -				GRAVELLY SILTY SAND: Grey	Nbn										-
10103/2011 11:40		—184.0	2.0- - - -	Vibracore	H-Casing													-
יב אבות אייושות א פרבי אבות ה	-	-183.5	2.5- - - - - 3.0-										24	42	34			-
MAINIEIN ALL_VIII I I I L	-	—182.5	3.5-				LIMESTONE: Framnebted rock, light											-
ICE BUREHOLE KAIL ALIG	 - - - - -		- 4.0- - -				grey to white, pulverized, angular, sharp edges			X								-
-B Log	ļ	—181.5	4.5-		r4 0°													<u> </u>
JOINT LIBRARY			- -		[4.6]		To Target Depth. Drillhole BH16-R035 terminated at 4.6m.											_
1	Note	<u>-181.0</u> S:	5.0-				·					_						
=																		

BAFFINI AND GINT LIBRARY GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ </br>

BOREHOLE REPORT

BH16-R036

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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

Co	ontract	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogge	d:	10/12/2016	L	ogge	d By	:			UK	
Dr	riller:	Va	nce	Mad	den	Hole Diameter (mm): 96	Date R	eviev	ved	1 :2/10/2017	+	evie	wed	Ву:			SH/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	0	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
Unobserved due to Permafrost			Vibracore	H-Casing		Gravelly SAND, some SILT, trace COBBLES: Organic, grey to brown, angular to subangular gravel SAND and SILT, with GRAVEL trace COBBLES: Brown to grey, angular to subangular gravel SILT and COBBLES, with SAND: Brown	Nf Nf				100		42	35				
	167.0	- - - 5.0-		[4.6]		To Target Depth. Drillhole BH16-R036 terminated at 4.6m.												 - - -

BAFFINIAND GINT LIBRARY.GLB. Log. ICE BOREHOLE. RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ. <-DrawingFile>> 13/09/2017 11:25

BOREHOLE REPORT

BH16-R037

Easting:

Northing:

Surface Elevation:

Bottom Elevation:

Sheet 1 of 1

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Location:

Datum:

7,929,786.0 m 162.25 m

527,873.0 m

Proposed Rail Alignment

Platform: Ground 157.65 m 4.6 m

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/12/2016

Total Depth: Logged By: UK

	oi. bo				Rig Type/ Mounting. Willisonic Rig					10/12/2010			yye	– ,				Ur
Driller:	Va	nce	Mad	lden	Hole Diameter (mm): 96	Date F	Rev	iew	ed	1:2/10/2017		_	view	ed E	By:			SH/WI
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	0	Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Test
-	-				SAND, trace SILT: Reddish brown,	Nf		П	Т		\top							
-	-				angular													
ļ	_									iii								
161.8	0.5-									i i i								
F	_									iii								
Ł	-									i i i								
-161.3	1.0-							X										
afros	-																	
Pern	-																	
op – 160.8	1.5					Nha												
Unobserved due to Permafrost	-					Nbn												
psen	-																	
- 160.3	2.0-									1 1 1								
-	-		g.															
ļ	-	Vibracore	H-Casing															
159.8	2.5-	₹	主															
109.6	2.5-							X		•		20	0	91	9			
Ė	-							M										
-	-																	
—159.3 —	3.0-									!!!								
ŀ	-																	
F	-																	
158.8	3.5-																	
F	-																	
-	-																	
158.3	4.0-							X				20						
-	-							M										
ţ	-																	
157.8	4.5-		[4.6]															
	-				To Target Depth.			П										
E	-				Drillhole BH16-R037 terminated at 4.6m.													
157.3	5.0																	
Notes:																		

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

BOREHOLE REPORT

BH16-R038

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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

	Coı	ntracto	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ed:	10/12/2016		l		d By				4.5 m MR	
	Dril	ler:	Sa	ımue	el Fly	/nn	Hole Diameter (mm): 96	Date R	evie	we	ed:2/10/2017				ved E				SH/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 Lype	Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
		- - - - -163.5	- - - 0.5-				SAND, trace SILT, trace GRAVEL: Light brown, reddish brown mixed, medium to coarse grained sand, rounded to subrounded gravel	Nf											-	
	ermafrost	- 163.0 -	- 1.0- - -						\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \										-	-
	Unobserved due to Permafrost		- 1.5= - -					Vc											-	- - -
27.11.10.20000	Unok	- 162.0 - -	2.0-	Vibracore	H-Casing				K				16	2	89	9			-	-
יייוו ופוווייים וחייי כרם		- 161.5 - -	2.5— — —		_														-	- - - -
		- 161.0 - -	3.0-																-	-
ALIGININIEN 1 ALL_11		- 160.5 - -	3.5— — —																-	- - - -
ICE BOREHOLE RAIL		- 160.0 - -	- 4.0- - -										8						-	- - - -
GINI LIBRART.GLB LOG		- 	4.5 -		[4.5]		To Target Depth. Drillhole BH16-R038 terminated at 4.5m.													- - - -
} =	Note	159.0	5.0-					1						<u> </u>	<u> </u>		<u> </u>			ŧ

Project:

BAFFINLAND GINT LIBRARY.GLB. Log. ICE BOREHOLE. RAIL ALIGNMENT ALL_WITH ICE LOG_REV.3.GPJ. <

-CDrawingFile>> 13:09/2017 11:25

BOREHOLE REPORT

BH16-R039

Sheet 1 of 1

Client: **Baffinland Iron Mines**

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

	Cor	tracte	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ged	1: 10/12/2016			gge					4.5 III MR
	Dril	ler:	Sa	amue	el Fly	/nn	Hole Diameter (mm): 96	Date F	evi	iew	ed:2/10/2017		Re	view	ed E	Зу:			SH/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	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
			0.5-	-			SAND, trace SILT, trace GRAVEL: Light brown, reddish brown mixed, medium to coarse grained sand, rounded to subrounded gravel	Nf											-
63	Unobserved due to Permafrost.	—164.8 —164.3	1.0- - - - 1.5- - -					Nbn					20	3	94	3			-
S.GPJ < <ur>S.GPJ <<ur>S.GPJ <</ur></ur>	⊃ - - - - -	—163.8 —163.3	2.0-	Vibracore	H-Casing					\boxtimes									-
ALIGNIMEN I ALL_WITH ICE LOG_REV	-		3.0-																-
GLB LOG ICE BUREHULE KAIL A	-	- 161.8 - - - -	4.0-		[4.5]					\boxtimes									-
AND GIN I LIBRARY.	Note		- - - 5.0-				To Target Depth. Drillhole BH16-R039 terminated at 4.5m.												

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-R040

Easting:

Sheet 1 of 1

528,686.0 m

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

NAD83

Ground

Platform:

Datum:

Date Logged: 10/13/2016

Northing: 7,927,755.0 m Surface Elevation: 166.00 m

Bottom Elevation: 161.40 m

Total Depth: 4.6 m Logged By: UK

riller:	Va	ance	Mac	lden	Hole Diameter (mm): 96	Date F	Rev	ewe	ed:2/10/2017			view	ed E	Зу:			SH/WH
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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	1.0	Vibracore	H-Casing		SAND and SILT, trace GRAVEL: Reddish brown to grey, angular to subangular gravel	Nf					19						
-	-		[4.6]	<u>դուս վեր</u>	To Target Depth. Drillhole BH16-R040 terminated at 4.6m.												

BOREHOLE REPORT

BH16-R041

528,605.0 m

7,927,754.0 m

Client: **Baffinland Iron Mines**

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment Project No.: H352034

Datum: NAD83

Platform: Ground

Bottom Elevation: Total Depth:

Easting:

Northing:

Surface Elevation:

164.50 m

166.00 m

1.5 m

Driller:	V	ance	Mad		Hole Diameter (mm): 96	Date I	Rev	iew	ed: 2/	10/2017			view	ved I	Зу: 			SH/WI
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	C 0	Moisture ontent Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Test
M	0.5 1.0 2.0 2.5	Vibracore	O H-Casing		To Target Depth. Drillhole BH16-R041 terminated at 1.5m.		Rec	Seri						<u>a</u>	ă.			
—161.5 —	4.5	- - - -																

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

Notes:

BOREHOLE REPORT

BH16-R042

162.50 m

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground Easting: 528,517.0 m Northing: 7,927,713.0 m

Surface Elevation: 167.00 m

Total Depth: 4.5 m

Bottom Elevation:

С	ontract	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ged	: 10/14/2016		ogge	-				4.5 m MR	
D	riller:	Sa	ımue	l Fly	nn	Hole Diameter (mm): 96	Date R	levi	ew	ed:2/10/2017	Re	eview	ed E	Ву:			SH/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	
Unobserved due to Permafrost.	- - - - -166.5	1.5- - - - - - - - - - - - - - - - - - -		H-Casing (Casing))	SAND, trace GRAVEL: Reddish brown, light brown mixed, medium to coarse grained sand, angular to subangular gravel,	Nf	Re									-	
בספ וכר בסייבו יייבר ייבר יייבר יבר ייבר יייבר יייבר יייבר יייבר ייבר 63.5 163.0 163.0	3.5- - - - - 4.0- - - - - 4.0-		[4.5]		3.30 m to 4.60 m: Trace to some gravel	Nbn	,	X		15						-		
	162.0					To Target Depth. Drillhole BH16-R042 terminated at 4.5m.												-

BOREHOLE REPORT

BH16-R043

Easting:

Northing:

Surface Elevation:

Sheet 1 of 2

528,428.0 m

7,927,675.0 m

167.00 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Location: Proposed Rail Alignment Platform: Ground

Datum:

Bottom Elevation: 158.00 m

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Total Depth: 9.0 m Logged By: MR

Date Logged: 10/13/2016

Dri	ller:	Sa	mue	el Fly	/nn	Hole Diameter (mm): 96	Date F	Revi	iew	ed:2/10/2017		_	viev	ved I	Ву:			SH/W
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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Test
	-	-				SAND: Grey to light brown, fine to coarse grained	Nf											
	-	-				30a.100 g. a10a												
	- 166.5	0.5-																
	-	-																
	-	-																
	— —166.0	1.0-																
afrost	-	-																
Perm	-	-																
lue to	165.5	1.5-																
rved c	-	-								liii								
Unobserved due to Permafrost.	-	-																
<u>آ</u>	—165.0 —	2.0-																
	-	-																
	-	-																
	—164.5 —	2.5-																
	-	-							X									
	— —164.0	3.0-																
	-	-					Vc											
	-	-																
	— —163.5	3.5-																
	-	-																
	-	-																
	—163.0 —	4.0-							X	•		15						
	-	-							M									
	-	-	core	sing														
	 162.5 	4.5-	Vibracore	H-Casing		4.50 m to 7.50m: Trace gravel	Nf											
	-	-																
		5.0=																
Note	es:	0.0																

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

BOREHOLE REPORT

BH16-R043

Sheet 2 of 2

167.00 m

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment Datum: NAD83

Platform: Ground Easting: 528,428.0 m Northing: 7,927,675.0 m

Surface Elevation:

Bottom Elevation: 158.00 m

Total Depth: 9.0 m Logged By: MR

	Con	tracto	or: Bo	art L	_ong	year	Rig Type/ Mounting: MiniSonic Rig	Date Lo	gg	ed:	10/13/2016		1	gge	d By				9.0 m MR
	Drill	er:	Sa	amue	el Fly	'nn	Hole Diameter (mm): 96	Date Re	vie	we	d :2/10/2017			view					SH/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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
3/08/2017 11:25		-161.5 -161.0					SAND: Grey to light brown, fine to coarse grained (Continued)	Nf (Continued	Т	×									
IGNINEIN ALL WITH INE LOG NEV 3.0F3 SCHIAWIIGHIES	-	-159.5 -159.0					7.50 m to 9.00 m: Light brown, fine to medium grained sand, no gravel	Nf											
AND GINT LIBRART.GLB LOG TOE BOREHOLE RAIL ALTG	Note	-158.0 -157.5	9.5-		[9.0]		To Target Depth. Drillhole BH16-R043 terminated at 9.0m.						7						

BOREHOLE REPORT

BH16-R044

Easting:

Northing:

Surface Elevation:

Sheet 1 of 1

528,736.0 m

7,926,992.0 m

167.00 m

Client: Baffinland Iron Mines

Project No.: H352034

Datum:

Project:

Mary River Expansion Study Stage 2

NAD83

Location:

Proposed Rail Alignment

Platform: Ground **Bottom Elevation:** 162.50 m

Total Depth: 4.5 m

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

	Dri	ller:	Va	nce	Mad	den	Hole Diameter (mm): 96	Date R	eviev	ve	d:2/10/2017		Re	view	ed l	Ву:			SH/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	: - C	Moisture Content Profile	00 	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
•			- - - 0.5-				SANDY GRAVEL, trace COBBLES: Light brown, fine to coarse gravel , angular to subangular gravel												-
) Permafrost		1.0—						X	N I									-
67	Unobserved due to Permafrost	—165.5 —	1.5 - -			6. C	SAND, some SILT, some GRAVEL: Light brown, rounded to subrounded gravel, medium to coarse grained sand												-
Igr 6/2 3/03/2017 1.	ו	165.0 	2.0— — — — — — 2.5—	Vibracore	H-Casing				X				11						-
IT ICE LOG_NEV 3.GFJ ~~DIAW		 164.0 	3.0-																-
AIL ALIGINIMEIN I ALL_VII			3.5-																-
LOG ICE BUREHULE RA			4.0- - - -		[4.5]				X				16						_
IND GIN I LIBRAN I DEC		—162.5— — — ——162.0	4.5— — — — — — 5.0—				To Target Depth. Drillhole BH16-R044 terminated at 4.5m.												
41	Note																		

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25 Notes:

BOREHOLE REPORT

BH16-R045

528,961.0 m

7,926,756.0 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Platform:

Datum:

NAD83

Ground

Surface Elevation: **Bottom Elevation:**

Easting:

Northing:

Total Depth:

134.25 m 4.5 m

138.75 m

Project:

Location:

Mary River Expansion Study Stage 2

Proposed Rail Alignment

Contra						Rig Type/ Mounting: MiniSonic Rig					28/2016			ogge					C
Driller:		va	псе	iviad	lden	Hole Diameter (mm): 96	Date F	kev	ew	ea:2/1	0/2017		-	eviev	ved I	Βy:			SH/W
Water Flevation (m)	בוכאמנוסוו (ווו	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	Co 0	Moisture ntent Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Test
	7.3	0.5—	Vibracore	H-Casing		To Target Depth. Drillhole BH16-R045 terminated at 4.5m.				•			21						
	38	5.0									<u>i i i</u>		<u>_</u>	<u>L</u>	<u> </u>	<u> </u>		<u> </u>	
133	. a a	5.0							_				_						

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-R046

Sheet 1 of 1

133.60 m

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 10/28/2016

Easting: 529,065.0 m Northing: 7,926,599.0 m

Surface Elevation: 138.20 m

Bottom Elevation:

Total Depth: 4.6 m

Logged By: RS

١٠	ontract	or: Bo	an L	ong	year	RIG Type/ Mounting: MINISONIC RIG	Date	.ogg	jea:	10/28/2016	"	ogge	а ву	:			RS
D	riller:	E.I	Beac	chan	np	Hole Diameter (mm): 96	Date F	Revi	ewe	ed:2/10/2017	R	eviev	ved I	Ву:			SH/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
Unobserved due to Permafrost	-137.7 -137.2 -136.7 -136.2					SAND, some GRAVEL, trace SILT: Light brown, subrounded to rounded gravel, medium to coarse grained sand SAND and GRAVEL, trace SILT: Fine to medium grained sand SILT: Organics, peat, dark brown, black, organic odour, frozen	Nf Nf	,		•	6						-
DONE DATE TO THE TREE TO THE TANK THE T	- 135.7 - 135.2 - 134.7 - 134.2	2.5— 3.0—	Vibracore	H-Casing		SILTY SAND: Grey, fine to medium grained sand, brown layers	Nbn				40						-
		- 4.5= -		[4.6]		To Target Depth. Drillhole BH16-R046 terminated at 4.6m.											-
5	133 2	50-								<u> i i i </u>							
	133.2	5.0															

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

Notes:

BAFFINLAND GINT LIBRARY.GLB. Log. ICE BOREHOLE. RAIL ALIGNMENT ALL_WITH ICE LOG_REV.3.GPJ. <

-CDrawingFile>> 13:09/2017 11:25

Notes:

BOREHOLE REPORT

BH16-R053

Sheet 1 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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

	Con	tracto	or: Bo	art I	ona	vear	Rig Type/ Mounting: MiniSonic Rig	Date Le	oaa	ed:	10/28/2016		otal [ogge					6.1 m RS	
	Drill				ham		Hole Diameter (mm): 96				ed:2/10/2017		eviev						
ł			L.L	Jeac	IIaII			Date K	evie	VVE	:u. 2/10/2017	_	eviev	veu i	эу.			SH/WH	1
	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 Lype	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
	Unobserved due to Permafrost	-162.8 -162.3 -161.8 -160.8 -159.8 -159.8	0.5- - - - - - - - - - - - - - - - - - -	Vibracore Me	H-Casing Ca	Gr.	structure, accessory components. SAND, trace SILT, trace GRAVEL: Light grey to brown, medium to coarse grained sand	Nf		Huse		Telephone and the second of th	Per Control of the Co	- Ber	Ded .	Πά	Pla Pla		
=		158.3	5.0							_		_							#

BOREHOLE REPORT

BH16-R053

Sheet 2 of 2

528,238.0 m

7,928,027.0 m

163.25 m

157.20 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Ground

Location: Proposed Rail Alignment Datum:

Bottom Elevation:

Surface Elevation:

Easting:

Northing:

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/28/2016

Platform:

Total Depth: 6.1 m Logged By: RS

Dril	ler:	E.I	Bead	cham	пр	Hole Diameter (mm): 96	Date F	Rev	iew	ed:	:2/10/2017			view	/ed l	Зу:			SH/WI
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	0	Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Test
	- - -	- - -				SAND, trace SILT, trace GRAVEL: Light grey to brown, medium to coarse grained sand (Continued)	Nf (Continue												
-	- 157.8 - -	5.5 -				5.50 m to 6.10 m: Fine to medium grained sand	Nf		X				23						
	- - 157.3	6.0-		[6.1]															
	-	-				To Target Depth. Drillhole BH16-R053 terminated at													
	- - 156.8	6.5-				6.1m.													
	-	-																	
	- - 156.3	7.0-																	
	-	-																	
	- 155.8	7.5-																	
	- - -	-									įįį								
-	- 155.3	8.0-																	
	- - -	-																	
	- 154.8	8.5-																	
-	-	-																	
	- 154.3 -	9.0-																	
	- -	-																	
ļ	153.8 	9.5-																	
	- -	-																	
_	_{153.3} _	10.0																	

BAFFINI AND GINT LIBRARY GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ </br>

BOREHOLE REPORT

BH16-R067

Sheet 1 of 1

Client: Baffinland Iron Mines Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

,

Datum: NAD83

Ground

Platform:

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

	Cor	tracte	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	ged:	11/24/2016	L	ogge	d By	:			MR
	Dril	ler:	Mi	chae	el Sc	ott	Hole Diameter (mm): 96	Date F	levi	ewe	ed:2/10/2017	R	evie	wed I	Ву:			SH/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
		- - - - - - - - - - - - - - - - - - -	- - - 0.5- -			77 77 77 77 77 77 77 77 77 77 77 77 77	PEAT, with SAND, with GRAVEL, trace COBBLES: Dark brown to black, Organic, medium to coarse grained sand, rounded to subrounded cobbles	Nf										-
	Unobserved due to permafrost		1.0- - - - - 1.5-				SAND, trace GRAVEL, trace COBBLES: Dark grey to dark brown, medium to coarse grained sand, rounded to subrounded cobbles	Nf		X		16	3	60	37			- - - - - - -
02.11 /1U2/WU/E	Unobservec		- - 2.0- - -	Vibracore	H-Casing													- - - - - -
LUG_REV 3.GPJ < <ui< td=""><td>-</td><td></td><td>2.5- - - - - 3.0-</td><td> </td><td>工</td><td></td><td></td><td></td><td></td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>- - - - - - - -</td></ui<>	-		2.5- - - - - 3.0-		工					X								- - - - - - - -
RAIL ALIGININEN I ALL_WITH ICE	-	- - 185.5 -	3.5- - -	-														_ _ _ _ _ _ _ _
GLB Log ICE BOREHOLE R	-	—185.0 - - - - - - - - - - - -	4.0- - - - - 4.5-		[4.6]				,									-
ND GIN I LIBRARY.		- - - 184.0	- - - 5.0-				To Target Depth. Drillhole BH16-R067 terminated at 4.6m.											
3	Note	s:																

Contractor: Boart Longyear

BOREHOLE REPORT

BH16-R068

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 11/24/2016

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

0	ontracto	or: Bo	an L	.ong	year	RIG Type/ Mounting: MINISONIC RIG	Date L	.ogg	gea	11/24/2016	-	ogge	d By	:			MR
Dı	iller:	Mi	chae	l Sc	ott	Hole Diameter (mm): 96	Date F	Revi	ew	ed:2/10/2017	R	evie	wed I	Зу:			SH/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	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
W Unobserved due to permafrost	- - - - - - - - - - - - - - - - - - -			H-Casing Ca		SAND: Light brown to yellowish grey, fine to medium grained sand SAND, trace SILT, trace GRAVEL: Dark brown, Organic, fine to medium grained sand	Vx	Reco	Samu Samu Samu Samu Samu Samu Samu Samu		원 42 15 15 15 15 15 15 15 15 15 15 15 15 15		- Be	9A	DIT I	P P R	
100 100 100 100 100 100 100 100 100 100	- - - - - - - - - - - - - - -	4.0-		[4.6]													- - - - - -
	- - - 178.5	-5.0-				To Target Depth. Drillhole BH16-R068 terminated at 4.6m.											-

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11.25

Notes:

Contractor: Boart Longyear

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11.25

BOREHOLE REPORT

BH16-R069

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 11/23/2016

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

	Driller:		E.B	eac	ham	пр	Hole Diameter (mm): 96	Date F	evie	ewe	ed:2/10/2017		Rev	view	ed E	Зу:			SH/WH	
	Water Flevation (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	0	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
	- - - - - 151	1.5	0.5—				Sandy SILT, with GRAVEL, with COBBLES: White to grey, fine grained sand, angular to subangular gravel													-
	- - - 151	1.0	1.0-							X		:	21	19	41	40				-
	- - - - - -	0.5	1.5—																	
gFIIe>> 15/08/2017 11.25	- - - - -		2.0-	Vibracore	H-Casing															-
OG_REV 3.GPJ SSDIAWIII			2.5—							X									-	-
IGINIMEIN I ALL WITH I CE L	- - - 148 -	3.5	3.5-																-	- - -
ICE BUREHULE KAIL AL	- - 148 - -	3.0	4.0-							X										-
INI LIBRARY.GLB LOG		7.5	4.5-		[4.6]		To Target Depth. Drillhole BH16-R069 terminated at 4.6m.													-
INLAIND G	Notes:	7.0	5.0																	ļ

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

Notes:

BOREHOLE REPORT

BH16-R070

Sheet 1 of 1

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2 Datum:

Location: Proposed Rail Alignment

NAD83

Platform: Ground Easting: 540,273.0 m

Northing: 7,921,201.0 m Surface Elevation: 146.00 m

141.40 m **Total Depth:** 4.6 m

Bottom Elevation:

C	ontract	or: Bo	art L	.ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	.ogg	ged	d: 11/23/2016		1	gge	-				4.6 m MR	
Di	riller:	Mi	chae	l Sc	ott	Hole Diameter (mm): 96	Date F	Revi	ew	ved:2/10/2017		Re	view	ed E	Ву:			SH/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 Profil	e 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
We control of the con	- - - - -145.5 - - - -	20	Vibracore	H-Casing Ca	B 등 점 Gr	structure, accessory components. PEAT, GRAVELLY SAND: Brown, coarse grained sand SAND, trace GRAVEL: Brown to light brown, fine to medium grained sand, angular to subangular gravel 1.50 m to 3.00 m: Light brown, some silt	Nf Nf Nf		ames X			8 8	O O	19d 84	16 16	Пр	Pla		
	141.0			[4.6]		To Target Depth. Drillhole BH16-R070 terminated at 4.6m.													+

BAFFINLAND GINT LIBRARY.GLB. Log. ICE BOREHOLE. RAIL ALIGNMENT ALL_WITH ICE LOG_REV.3.GPJ. <

-CDrawingFile>> 13:09/2017 11:25

BOREHOLE REPORT

BH17-B001

Sheet 1 of 4

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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:

Co	ontract	or: Bo	art L	_ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogge	ed:	4/22/2017				d By				UK
	iller:				or Sam					d:6/8/2017				ved E				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 Lype	Moisture Content Profile 0 50 10	00	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
						SILTY SAND: Brown, fine grained sand	Nf											-
2		1.5- - - -				SAND, trace SILT: Grey, fine grained sand	Nbn											-
	123.0 	2.0-	Sonic Drilling	CASING								26	0	93	7			-
		2.5- - - - 3.0-	Sonic	NO CV														-
	- - 121.5 - -	3.5-																-
	- 121.0 - - -	- 4.0- - - -																-
		4.5-		[5.0]		SILT, trace SAND: Black organics, fine grained sand	Nbn											-
No	tes:	5.0																

Project:

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

BOREHOLE REPORT

BH17-B001

Sheet 2 of 4

Client: **Baffinland Iron Mines**

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

	Contra	acto	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	ogg	jed:	4/22/2017	- 1		ged E				UK
	Driller	:	En	nile a	and/d	or Sam	Hole Diameter (mm): 100	Date R	evie	ewe	ed:6/8/2017	F	evi	ewed	By:			CH/WH
	Water Elevation (m)	Lievation (III)	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 10	Field Water Content	Demont Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
67.11.73	- - - - - - - - - - - - - - - - - - -	9.5 9.0 8.5	5.5				SILT, trace SAND: Black organics, fine grained sand (Continued)	Nbn (Continue Vs				37	· · · · · ·	6	94			-
ALL_WITH ICE LOG_REV 3.GPJ < <drawingfile>> 13/09/201</drawingfile>	- - - - -11 - -	7.5	7.5- - - - 8.0- - - 8.5-	Sonic Drilling	NO CASING		SILTY SAND, trace GRAVEL, trace COBBLES: Dark grey, fine to medium grained, well graded sand; multi-coloured, fine to coarse, rounded cobbles	Vx										-
U GINT LIBRARY.GLB LOG ICE BOREHOLE KAIL ALIGNMENT.	- - - - - - - - - - - - - - - - - - -	6.0	9.0-		[10.0]		8.80 m: Inferred boulders SILT with SAND, trace GRAVEL: Dark grey, fine to coarse grained, well graded sand; multi-coloured, fine to coarse, rounded gravel	-				100		65	5 29			-
5	Notes:	0.0	10.0															

BOREHOLE REPORT

BH17-B001

Easting:

Northing:

Surface Elevation:

Sheet 3 of 4

529,031.0 m

7,916,747.0 m

125.00 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11.25

Notes:

Mary River Expansion Study Stage 2

NAD83

Location: Proposed Rail Alignment Platform:

Bottom Elevation: 108.50 m

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Ground

Total Depth: 16.5 m Logged By: UK

Date Logged: 4/22/2017

Datum:

Dri	iller:	En	nile a	and/d	or Sam	Hole Diameter (mm): 100	Date R	evi	ew	red: 6/8/2017	F	Revie	wed	Ву:			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
		10.5-				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		X		4:	2 7	30	63			
		12.0-	Sonic Drilling	NO CASING		12.20 m: Inferred boulder	Nf										-
		13.0—	0	2		12.80 m: Grey, inferred boulder			\times		1:	2					-
	- - - - -111.0	14.0-				13.70 m to 16.50 m: Grey, fine grained sand; multi-coloured, fine, rounded gravel			\times								-
		14.5—		[15.0]				-									-

Contractor: Boart Longyear

BOREHOLE REPORT

BH17-B001

Sheet 4 of 4

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 4/22/2017

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

C	ntracto	or: Bo	an L	ong	year	RIG Type/ Mounting: MiniSonic Rig	Date L	.ogg	jec	d: 4/22/2017		Lo	gge	а ву:				UK
Dr	iller:	En	nile a	and/	or San	Hole Diameter (mm): 100	Date F	Revi	ew	red: 6/8/2017		Re	view	ed E	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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	- - - - - - - - - - - - - - - - - - -	- - - 15.5- - - - 16.0- -	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						- - - - - - - - - - - - - - -
		16.5— — — — — — — ———————————————————————			<u> </u>	Drilling Refusal. Drillhole BH17-B001 terminated at 16.5m.					1							
	107.5 	- 17.5- - - -																- - - - - -
	107.0 	18.0— — — — — —																-
		- - 19.0- -																 - - - -
	105.5 																	-
	105.0	20.0				<u> </u>												

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11.25 Notes:

Contractor: Boart Longyear

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

BOREHOLE REPORT

BH17-B002

Sheet 1 of 6

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 4/18/2017

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: AΒ

	Drille	r:	Em	nile a	and/d	or Sam	Hole Diameter (mm): 100	Date F	Reviev	ved:6/8/2017		Re	view	ved E	Зу:			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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
	- - - - 1: - -	24.5					SAND, some SILT: Brown, medium to fine grained, well graded sand					19	0	88	12			-	
	-	23.0	2.0	Sonic Drilling	NO CASING													-	
	-	22.0	3.0—				ORGANIC SILT, some SAND: Black, fine grained sand with strong organic odour.	Nbn			,	37	0	16	84			-	
ביין ביינולים ביטן וכב ביטורים וייני	- - - -	21.0	4.0— 4.5— 4.5—		[5.0]			Nbe Nbn Vx										-	
	Notes:	20.0	5.0		[0.0]			l		<u> </u>			l	<u> </u>		<u> </u>			ŧ

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

Notes:

BOREHOLE REPORT

BH17-B002

Sheet 2 of 6

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

NAD83

Platform: Ground

Datum:

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

Co	ntracto	or: Bo	art L	.ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	.ogg	ged	d: 4/18/2017			ed By				25.6 m AB
Dri	ller:	En	nile a	and/d	or Sam	Hole Diameter (mm): 100	Date F	Revi	ew	red:6/8/2017	R	evie	wed	Ву:			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
Wa			Sonic Drilling Met	NO CASING Cas	Grand Control of the control of the		Nbn (Continue		lgmpl Sampl	0 50 100	24			52	Fidn	Plas	
		8.0— 8.5— 9.0—		[10.0]		9.10 m to 12.20 m: Black, medium to fine grained, well graded sand; multicoloured, rounded to subrounded gravel	Nbe Nf										

Project:

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

BOREHOLE REPORT

BH17-B002

Sheet 3 of 6

Client: **Baffinland Iron Mines**

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

Co	ntract	or: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date Logged:	4/18/2017	1		d By				25.6 M AB
Dr	iller:	En	nile	and/	or San		Date Reviewe				ved E				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.	Recovery Sample Type	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
		- - - 10.5- - - - - 11.0-				SILTY and SAND: Brown, fine to coarse grained, well graded sand (Continued)	Nf (Continued)								-
	- - - - - - - - - - - - - - - - - - -	- 11.5- - - - 12.0-							9	3	66	32			-
		- - 12.5- - -	Sonic Drilling	NO CASING		SAND, some SILT, trace to some GRAVEL: Brown, fine to coarse grained, poorly graded sand									-
	—112.0 —	13.0-													-
		14.0- - - - - 14.5-													-
No	110.0 tes:	15.0=		[15.0]											

Contractor: Boart Longyear

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11.25

Notes:

BOREHOLE REPORT

BH17-B002

Sheet 4 of 6

Client: **Baffinland Iron Mines**

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment Project No.: H352034

Datum: NAD83

Platform: Ground

Date Logged: 4/18/2017

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: AΒ

D	riller:	En	nile a	and/d	or San	Hole Diameter (mm): 100	Date F	Revi	ew	ed:6/8/2017	R	eviev	ved l	Ву:			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
	- - - - -109.5	- - - - 15.5—				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— — —	Illing	ING													- - - -
	107.5 	17.5— — — —	Sonic Drilling	NO CASING			Nbe		X								- - -
	107.0 	18.0— — —															- - - -
	106.5 	18.5— — — — —				18.60 m to 19.80 m: Some GRAVEL: Multi-coloured, well graded; rounded gravel	Nf		X	•	8	15	66	20			- - - -
		- - - 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										-

Contractor: Boart Longyear

BOREHOLE REPORT

BH17-B002

Sheet 5 of 6

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 4/18/2017

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

	Contrac	tor: bu	an L	Long	year	RIG Type/ Mounting: MiniSonic Rig	Date L	ogge	ea:	4/18/2017	"	ogge	d By	:			AB
L	Driller:	En	nile a	and/	or San	Hole Diameter (mm): 100	Date R	evie	we	d :6/8/2017	R	eviev	ved I	Ву:			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	Sample Lype	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
		20.5-				to coarse gravel SAND, some SILT, trace to some GRAVEL: Brown, fine to coarse grained, poorly graded sand (Continued)	Nbn										-
		21.0-															
		21.5=				21.30 m to 24.40 m: SILTY SAND, trace GRAVEL: Brown, fine grained sand	Nf										-
	—103.0 - -	22.0-	ling	NG					7								-
,		22.5-	Sonic Drilling	NO CASING													-
	- 102.0 - - -	23.0-															-
		23.5-									15	1	72	27			-
	- 101.0 - -	24.0-															-
	100.5 	24.5-			+ +	Inferred BEDROCK, grey, rock flour, Granitic	-										-
F	100.0	25.0		[25.0]	+ + + +												

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

Notes:

BOREHOLE REPORT

BH17-B002

Sheet 6 of 6

529,323.0 m

Easting: Client: **Baffinland Iron Mines** Project No.: H352034

Northing: 7,916,577.0 m Project: Mary River Expansion Study Stage 2 Datum: Surface Elevation: 125.00 m NAD83

Bottom Elevation: 99.40 m Location: Proposed Rail Alignment Platform: Ground **Total Depth:** 25.6 m

Date Logged: 4/18/2017 Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig Logged By: AΒ

	oi. bo			,	Rig Type/ Mounting. Willisonic Rig		- 3	9	1. 4/10				33-	и Бу				Al
Driller:	En	nile a	and/d	or San	Hole Diameter (mm): 100	Date I	Revi	ew	ed :6/8/2	2017		Re	view	ved E	Зу:			CH/WF
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	Cor	Moisture ntent Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Tests
- - - - 99.5	- - - - 25.5-	Sonic Drilling	NO CASING	+ +	Inferred BEDROCK, grey, rock flour, Granitic (Continued)													
- - 99.0	26.0—				Drilling Refusal. Drillhole BH17-B002 terminated at 25.6m.													
	26.5— — — — — — — 27.0—																	
- - - - -97.5																		
- - 97.0 -	28.0— —																	
- 96.5 - - - - - -	28.5— — — — — 29.0—																	
- - - - - - -95.5	29.5—																	
95.0 Notes:	30.0																	

Contractor: Boart Longyear

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11.25

BOREHOLE REPORT

BH17-C001

Sheet 1 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 4/13/2017

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: AΒ

				•	•	5		٠.	•				55-	-,				AD
I	Driller:	En	nile a	and/	or Sam	Hole Diameter (mm): 100	Date F	Revi	ew	ved:6/8/2017		Re	view	ed E	Зу:			CH/WH
20,000	vvater 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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	- - - -73.5	 0.5 1.0				ORGANICS: Brown, fine grained, black mottling GRAVELLY SAND, some COBBLES: Grey, well graded, fine grained sand; Coarse, rounded to subrounded gravel												
	- 72.5 - - - - 72.0	1.5-				SAND: Multi-coloured, coarse grained, poorly graded 2.10 m: Black mottling	Nf		\times									
	- - -71.5 - - - -71.0	2.5— - - - - - - - 3.0—	Sonic Drilling	NO CASING	ાં પ્રાપ		NE											
	- - - -70.5	3.5-				SAND and SILT, some GRAVEL: Reddish brown, poorly graded, coarse grained sand; coarse, rounded gravel 3.40 m to 3.70 m: Inferred cobbles	Nf Nf					7	14	49	37			
ים בספ וסב בסוגבווסבר ויסור אבו		4.0-				3.70 m to 6.10 m: Grey, coarse grained, well graded sand; rounded to sub-angular, coarse gravel	INI											
	69.0 lotes:	5.0—		[5.0]					X									

Contractor: Boart Longyear

BOREHOLE REPORT

BH17-C001

Sheet 2 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment Datum: NAD83

Platform: Ground

Date Logged: 4/13/2017

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

L	Drille	r:	Em	nile a	and/	or Sam	Hole Diameter (mm): 100	Date Re	evie	ewe	ed:6/8/2017	R	evie	wed	Ву:			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	
	- - - - - - -	8.5	- - - 5.5-				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 (Continue Nf	d)	X								-	
	- - -6 -	6.80	6.0-)			6.10 m to 7.60 m: No gravel encountered, light brown, fine to coarse grained sand											-	
77.1	- - -	7.5	6.5— - - - - 7.0—	Sonic Drilling	NO CASING													-	- - - -
	- - - - -	6.5	- - - 7.5-				7.30 m: Inferred cobbles		<			3	0	48	52			-	-
	- - - - - - 6	66.0	- - - 8.0-		[8.2]	50000000000000000000000000000000000000	7.60 m to 8.20 m: Grey, fine grained Sand; well-graded, rounded gravel											-	
	- - 6	55.5	8.5— —			2 1 1 1	Drilling Refusal. Drillhole BH17-C001 terminated at 8.2m.											-	
	- 6 - -	55.0	9.0—															-	
	6 	4.5	9.5—															-	
F	Notes:	m.u .	10.0																Ē

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25 Notes:

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

BOREHOLE REPORT

BH17-C002

Sheet 1 of 3

116.00 m

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground Easting: 519,532.0 m Northing: 7,957,667.0 m

Surface Elevation:

Bottom Elevation: 105.30 m

Total Depth: 10.7 m Logged By: UK

	Contra	ctor	r: Bo	art L	.ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	.ogg	ged	l: 4/13/2017				Jepu d By				UK
	Driller	:	Em	nile a	and/d	or Sam	Hole Diameter (mm): 100	Date R	Revi	ew	ed:6/8/2017		Re	viev	ved I	Зу:			CH/WH
	Water Flevation (m)	בוכאמוסוו (ווו)	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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	- - - -	5.5	- - - 0.5-				SAND, trace GRAVEL: Brown, fine to medium grained sand; coarse, rounded gravel	Nf											-
	- - - - -11! - -	5.0	- - 1.0- - -			00000	COBBLES and BOULDERS, some SAND, trace GRAVEL: White, subangular cobbles; Inferred boulders	Nf		\times									-
13/03/2017 11.23			1.5-	ing	J.G		GRAVELLY SAND, some SILT: Grey, fine to coarse grained sand; coarse gravel	Nf											-
Carrie Solo Samuel III	- 11: - - - - -		2.5	Sonic Drilling	NO CASING		ICE: Clear to cloudy texture 3.00 m to 9.10 m: White cloudy texture	ICE					10	22	59	19			-
	- - - - 11: -	2.5	3.5																-
GLB LOG ICE BUREHULE RA	- 11: - - - - -		4.0— - - - - 4.5—																-
AIND GINT LIBRART.	Notes:	1.0	5.0		[5.0]														

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

BOREHOLE REPORT

BH17-C002

Sheet 2 of 3

116.00 m

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground Easting: 519,532.0 m Northing: 7,957,667.0 m

Bottom Elevation: 105.30 m

Total Depth: 10.7 m Logged By: UK

Surface Elevation:

	Con	tracto	or: Bo	art L	_ong	year	Rig Type/ Mounting: MiniSonic Rig	Date Logged	: 4/13/2017	1	ged By				10.7 m UK
	Drill	er:	En	nile	and/d	or Sam	Hole Diameter (mm): 100	Date Reviewe	ed:6/8/2017	Revi	ewed	Ву:			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.	Recovery Sample Type	Moisture Content Profile 0 50 100	Field Water Content	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	-	-110.5 -110.0	5.5- - - - - - - - - -				ICE: Clear to cloudy texture (Continued)	ICE (Continued)							
13/US/ZU1/ 11.23	-	-109.5 -109.0	6.5- - - - - 7.0- -	rilling	CASING										
LL_WITH ICE LOG_REV 3.GPJ SSDIAWING	-	-108.5 -108.0	7.5- - - - 8.0- - -	Sonic Drilling	NO CA										
S LOG ICE BUREHULE KAIL ALIGNIMEN I A	-	-107.5 -107.0	8.5- - - 9.0- - - 9.5-				8.80 m to 9.10 m: Ice with silt Inclusions								-
FINLAND GINT LIBRARY.GLB	Note	-106.0	9.5- - - - - 10.0-		[10.0]										

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11.25

Notes:

BOREHOLE REPORT

BH17-C002

Sheet 3 of 3

105.30 m

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground Easting: 519,532.0 m Northing: 7,957,667.0 m

Surface Elevation: 116.00 m

Total Depth: 10.7 m

Bottom Elevation:

	Contra	ector:	Boo	rt I /	ากสง	war.	Rig Type/ Mounting: MiniSonic Rig	Date Logged:	4/13/2017	1	otal D ogged					10.7 m
																UK
ŀ	Driller		Emi	ie a	nd/c	or Sam	,	Date Reviewe	d:6/8/2017	_	eview	ed E	By:			CH/WH
	Water Elevation (m)	Denth (m)	nepun (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Description 5 5	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	- - - - - -	5.5 1	10.5		NO CASING		ICE: Clear to cloudy texture (Continued)	ICE (Continued)								-
	- - 10	5.0 1	11.0-				To Target Depth. Drillhole BH17-C002 terminated at 10.7m.									- - - - -
67:1	- - -		11.5-													- - - -
ing inches	- - -		12.0-													-
	- - -		13.0													- - - -
755	_ _ _ 	2.5 1	13.5—													-
	- - -		14.0													- - - -
LOG 101 201 111	- - - -		-													- - -
	- - -		14.5													-
F		1														

BOREHOLE REPORT

BH17-C003

Sheet 1 of 2

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Northing: Surface Elevation:

Bottom Elevation:

Easting:

7,957,541.0 m 118.25 m

520,130.0 m

Location: Proposed Rail Alignment

Platform: Ground

Datum:

109.15 m 9.1 m

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 4/14/2017

Total Depth: Logged By: UK/AB

Dri	iller:	En	nile a	nd/o	r Sam	Hole Diameter (mm): 100	Date R	evie	wed:6/8/2017	Re	eviev	ved E	Зу:			CH/WH
	(m) r	<u></u>			Log	Soil Description			Moisture	Content	/el	P	s			
_	tior	π) I	р	g	jc	TYPE; plasticity or particle characteristics	Frozen Soil	9)	ater (Gra	Sanc	Fine	i i	ndex	Other

vvalei	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	Cont	loisture ent Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Tests
	- - - 117.8 -	0.5-				SILTY SAND: Brown, fine to medium grained sand Inferred BOULDERS, GRAVELLY SAND: Brown, coarse grained sand; Fine to coarse, rounded to sub-angular gravel													
-	- 	- 1.0- - - - - 1.5-																	
	- - - 116.3 -	2.0—							\bigotimes										
-	- 	2.5— — — — — — 3.0—	Sonic Drilling	NO CASING															
	- - - - 114.8	3.5—				GRAVELLY SILTY SAND: Grey, coarse grained, poorly graded sand; Multi-coloured, coarse, rounded gravel			\times	•			7	33	46	21			
	- 114.3 - - -	4.0-				4.00 m to 4.60 m: Inferred boulders													
-		4.5— — — — — 5.0—		[5.0]	0 6	SILTY SAND, trace GRAVEL: Light brown, well graded sand	Nf												

Contractor: Boart Longyear

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11.25

Notes:

BOREHOLE REPORT

BH17-C003

Sheet 2 of 2

520,130.0 m

7,957,541.0 m

118.25 m

109.15 m

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

NAD83

Platform: Ground

Date Logged: 4/14/2017

Datum:

Bottom Elevation:

Easting:

Northing:

Surface Elevation:

Total Depth: 9.1 m

Logged By: UK/AB

Di	riller:	En	nile a	and/d	or Sam	Hole Diameter (mm): 100	Date Reviewed: 6/8/2017		Re	view	ed B	y:			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.	Sar Re	ture Profile 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	-	-				SILTY SAND, trace GRAVEL: Light brown, well graded sand (Continued)	Nf (Continued)								
		5.5 -						 	24	4	73	23			-
		6.0-				6.10 m to 9.10 m: Some cobbles, rounded to sub-rounded, multi-coloured,									- - - -
	111.8 	6.5 -				up to 10 cm diamater									- - - -
		7.0-													- - -
	110.8 	7.5—	Sonic Drilling	NO CASING											-
	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			-
1	_ _ _ 108.8	9.5-				To Target Depth. Drillhole BH17-C003 terminated at 9.1m.									-
	-	- - -		[10.0]											
=	108.3	10.0	_	_					_						-

Contractor: Boart Longyear

BOREHOLE REPORT

BH17-C004

Sheet 1 of 3

116.30 m

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

NAD83

Platform: Ground

Date Logged: 4/14/2017

Datum:

Easting: 520,486.0 m Northing: 7,956,367.0 m Surface Elevation:

Bottom Elevation: 105.60 m

Total Depth: 10.7 m Logged By: AΒ

				Ū	,	3 . // po 33 .		-				-99-	•				Ab	
Dr	iller:	En	nile a	and/d	or Sam	Hole Diameter (mm): 100	Date F	evi	ewe	ed:6/8/2017	_	eviev	ved I	Ву:			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	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
						SAND, some SILT, trace GRAVEL: Grey, well graded, sand; Fine to coarse, rounded to sub-rounded gravel			X								-	
		1.5— 2.0—				1.80 m to 3.0 m: Some cobbles											-	
	_ _ 113.8 _ _ _ _	2.5—	Sonic Drilling	NO CASING				<u> </u>	X								-	
	113.3 	3.0-				SILTY SAND: Light brown, fine to coarse grained, poorly graded sand	Nf										-	-
		3.5—				3.40 m: Inferred boulder			X									-
		4.0— — — —				4.30 m: Inferred boulder											<u>-</u>	
	111.8 	4.5— - - - - 5.0—		[5.0]			Vx											- - -

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25 Notes:

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

Notes:

BOREHOLE REPORT

BH17-C004

Sheet 2 of 3

105.60 m

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground Easting: 520,486.0 m Northing: 7,956,367.0 m

Surface Elevation: 116.30 m

Total Depth: 10.7 m

Bottom Elevation:

c	ontract	or: Bo	art L	.ong	year	Rig Type/ Mounting: MiniSonic Rig	Date Logge	ed:	4/14/2017		gge	-				AB	
	riller:	En	nile a	and/d	or Sam	Hole Diameter (mm): 100	Date Revie	we	ed:6/8/2017	Re	view	ed E	Ву:			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	046	Moisture Content Profile 0 50 100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
		5.5				SILTY SAND: Light brown, fine to coarse grained, poorly graded sand (Continued)	Nf (Continued)									-	
	- - - - -108.8	- - - 7.5-	Sonic Drilling	NO CASING		7.20 m: Inferred Boulder SILTY SAND, trace GRAVEL: Brown,				30	9	75	17			-	
	- - 108.3 - -	8.0- - -		_		well graded sand, multi-coloured, fine, rounded to subangular gravel										-	
	- 107.8 - - - - - - - - - 107.3	8.5- - - - - - 9.0-														-	- - - -
		9.5-		[10.0]		9.10 m to 9.80 m: Some inferred fragmented cobbles				10	8	60	32			-	

Contractor: Boart Longyear

BOREHOLE REPORT

BH17-C004

Easting:

Sheet 3 of 3

520,486.0 m

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 4/14/2017

Northing: 7,956,367.0 m Surface Elevation: 116.30 m

Bottom Elevation: 105.60 m

Total Depth: 10.7 m Logged By: AB

	Contract	or: Bo	art L	.ong	year	RIG Type/ Mounting: MINISONIC RIG	Date	.og	ge	a:	4/14/2017	LC	ogge	а ву				AB
	Driller:	En	nile a	and/d	or Sam	Hole Diameter (mm): 100	Date F	Revi	iew	ved:	:6/8/2017	R	eviev	ved E	Зу:			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	0	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	- - - - -105.8	10.5—		NO CASING		SILTY SAND, trace GRAVEL: Brown, well graded sand, multi-coloured, fine, rounded to subangular gravel (Continued)			X									
	- - 105.3 - -	11.0-				To Target Depth. Drillhole BH17-C004 terminated at 10.7m.												
	- 104.8 - - -	11.5= - -																
		12.0-																-
6		12.5— — —																
		13.0-																
		13.5— —																
1	- - 102.3 -	14.0- -																-
110000	_ 101.8 	14.5—																-
: : : :	101.3	15.0-																
. 1																		

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11.25

Notes:

BOREHOLE REPORT

BH17-C005

Easting:

Northing:

Total Depth:

Surface Elevation:

Bottom Elevation:

Sheet 1 of 2

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Location:

Notes:

Proposed Rail Alignment

Platform: Ground 185.00 m 175.90 m

525.227.0 m

7,938,527.0 m

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

9.1 m

Date Logged: 4/14/2017

Datum:

Logged By: UK

Driller: Emile and/or Sam Hole Diameter (mm): 100 Date Reviewed: 6/8/2017 Reviewed By: CH/WH (E) Field Water Conten Soil Description Elevation $\widehat{\Xi}$ Moisture Percent Sand Graphic L Other Plastic Index ype Method Liquid Limit Casing TYPE; plasticity or particle characteristics Content Profile Depth (Frozen Soil **Tests** Water (size, grading, shape, roundness), colour, structure, accessory components. Description Sample T 0 50 100 SILTY SAND: Grey, fine grained, poorly Nf Nbn -183.5 ICE and SILTY SAND: Ice rich, grey, Vr poorly graded sand BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG REV 3.GPJ «CDrawingFile» 13/09/2017 11:25 -183.0 2.0-CASING Sonic Drilling -182.5 9 3.0-SILTY SAND, some GRAVEL: Grey, Nf fine to coarse grained sand; coarse, rounded to subrounded, well graded gravel. 3.5 -181.0 4.0-4.60 m to 6.10 m: Some cobbles, trace Nbn boulders

Contractor: Boart Longyear

BOREHOLE REPORT

BH17-C005

Sheet 2 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

NAD83

Platform: Ground

Date Logged: 4/14/2017

Datum:

Easting: 525,227.0 m Northing: 7,938,527.0 m

185.00 m **Bottom Elevation:** 175.90 m

Surface Elevation:

Total Depth: 9.1 m Logged By: UK

	Contr	acto	or: Bo	an L	.ong	year	RIG Type/ Mounting: MiniSonic Rig	Date Logg	ea	1: 4/14/2017		Lo	gge	a By	:			UK
L	Drille	r:	En	nile a	and/	or San	Hole Diameter (mm): 100	Date Revie	w	ed:6/8/2017		Re	view	ved E	Зу:			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	Sample Type	Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	- - - - - - -	79.5	5.5-				SILTY SAND, some GRAVEL: Grey, fine to coarse grained sand; coarse, rounded to subrounded, well graded gravel. (Continued)	Nf (Continued)	X	•		7	19	57	24			-
	- - -	79.0	6.0— — — — —															-
2000	-	78.0	- - - 7.0- -						X									-
	- - 1 - -	777.5	- 7.5- - - -	Sonic Drilling	NO CASING				\									-
	- - -	77.0	8.0— — — — 8.5—				8.50 m to 8.80 m: Some sand	Nbn	X									-
NETICE 1311	- - - 1	76.0	9.0-				To Target Depth.											-
כווין בובוייייייייייייייייייייייייייייייי	- - -	75.5	9.5—		[10.0]		Drillhole BH17-C005 terminated at 9.1m.											-
ŧ	1	75.0	10.0						_				_					

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25

Notes:

Contractor: Boart Longyear

BOREHOLE REPORT

BH17-C006

Easting:

Sheet 1 of 3

527,315.0 m

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 4/15/2017

Northing: 7,932,504.0 m

Surface Elevation: 178.60 m **Bottom Elevation:** 167.90 m

Total Depth: 10.7 m Logged By: AΒ

Dr	iller:	Em	nile a	and/d	or Sam	Hole Diameter (mm): 100	Date R	eviev	/ed : 6/8/2017	R	eviev	ved E	Ву:			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
		0.5-				SILTY SAND, inferred BOULDERS: Grey, fine grained, poorly graded sand; grey boulder fragments		×								_
		1.0— 1.5—														-
	176.6 	2.0—	Sonic Drilling	CASING				X								_
	— 176.1 — — — — 175.6 —	2.5	Sonic I	NO CA		SAND and SILT, some GRAVEL, ICE Inclusions: Brown sand; multi-coloured, fine, rounded gravel	Vr									-
I	175.1 	3.5— — — — 4.0—					Vc	X		14	19	43	38			-
	- - -174.1 - - - - 173.6	4.5— - - - - - - - 5.0—		[5.0]												

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:25 Notes:

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:26

BOREHOLE REPORT

BH17-C006

Sheet 2 of 3

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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

	Contrac	ctor: Bo	oart l	_ong	year	Rig Type/ Mounting: MiniSonic Rig	Date Log	ge	ed: 4/15/2017			otai L ogge	-				AB
	Driller:	Er	nile	and/	or Sam	Hole Diameter (mm): 100	Date Rev	iev	wed:6/8/2017		Re	view	ed E	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	Sample Type	Moisture Content Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	- - - - - - - - - - - - - - - - - - -		-			SAND and SILT, some GRAVEL, ICE Inclusions: Brown sand; multi-coloured, fine, rounded gravel (Continued)	Vr (Continued) Nbe										
15/09/2017 11:20	— 172.1 - - - - - 171.6 - -		rilling	CASING		SILT and SAND, inferred BOULDERS: Light brown silt; fine grained, well graded sand; grey boulder fragments		XX									
ALL_WITH IOE LOG_REV 3.0F3 SSDIAWIIIgn		6 8.0-	Sonic	NO CA		GRAVELLY SAND and SILT, ICE Inclusions: Light brown silt; angular gravel; possible boulders	Vx	IXXX			16	22	42	27			
GLB LOG ICE BUREHULE KAIL ALIGNIMEN I	- 169.6 	6 9.0-	-				Vr										
AIND GINT LIBRART.	168.6 Notes:			[10.0]	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0												

BOREHOLE REPORT

BH17-C006

Sheet 3 of 3

527,315.0 m

Easting: Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2 Datum: NAD83

Location: Proposed Rail Alignment Platform:

Ground

Northing: 7,932,504.0 m Surface Elevation: 178.60 m

Bottom Elevation: 167.90 m

Total Depth: 10.7 m

Continuo	tor: Bo	art L	ong	year	Rig Type/ Mounting: MiniSonic Rig	Date I	_og	ged	d: 4	4/15/2017		Lo	gged	d By	:			AB
Driller:	En	nile	and/d	or Sam	Hole Diameter (mm): 100	Date I	Revi	iew	ed:	6/8/2017			view	ed E	Зу:			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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
- - - - - 168.1	- - - 10.5-	Sonic Drilling	NO CASING		GRAVELLY SAND and SILT, ICE Inclusions: Light brown silt; angular gravel; possible boulders (Continued) 10.40 m to 10.70 m: Inferred Boulders	Vx (Continue												
- - -167.6 - - - - -	- 11.0- - - - - 11.5-		[10.7]	1115	To Target Depth. Drillhole BH17-C006 terminated at 10.7m.													
- - - - -166.6	12.0-																	
166.1 165.6	12.5-																	
- - 165.1	13.5-																	
- - 164.6 - - -	14.0-																	
164.1 	14.5-																	

Project:

BAFFINIAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNIMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13.09/2017 11:26

Notes:

BOREHOLE REPORT

BH17-C006B

Sheet 1 of 2

Client: **Baffinland Iron Mines**

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: $0.00 \; \text{m}$

Bottom Elevation: -6.10 m

Total Depth: 6.1 m

	Contrac	etor: Bo	ort I	ona	voor	Rig Type/ Mounting: MiniSonic Rig	Dato I	000	nod.	• 4/17/2017	1	otal D					6.1 m	
										: 4/17/2017		ogged					UK	
ŀ	Driller:		nile a	and/d	or Sam	Hole Diameter (mm): 100	Date R	evi	ewe	ed:6/8/2017	+	eview	ed E	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	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
	- - - - 0.5	0.5-				SILTY SAND, some COBBLES: Brown, fine grained sand; rounded to sub-rounded cobbles	Nf										_	- - - -
	- 1.0 - - - - - 1.5	1.0-				SILTY SAND: Reddish brown, fine to medium grained sand	Nf										-	
24:1:1:25:20:00:00:00:00:00:00:00:00:00:00:00:00:	- - - 2.0	2.0-	rilling	SING			Nbn										- - -	
J L L C C		2.5- - - - - 3.0-	Sonic Drilling	NO CASING													-	
	- - 3.5 - - -	3.5- - - -	-				Nbn										<u>-</u>	
Old Electricity and the second	4.0 	4.0-	-	[5.0]				;									-	- - - - -
ŧΕ	-5.0	5.0				<u> </u>		_										-

Contractor: Boart Longyear

BOREHOLE REPORT

BH17-C006B

Sheet 2 of 2

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 4/17/2017

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

Dri	ller:	En	nile a	and/	or San	Hole Diameter (mm): 100	Date I	Rev	iew	ed:6/8/201	7		Re	eviev	ved I	3v:			CH/WH
						Soil Description							_			- , .			OI I/VVII
Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Frozen Soil Description	Recovery	Sample Type	Moi Conten	sture It Profile	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	-	-			批	SILTY SAND: Reddish brown, fine to medium grained sand (Continued)	Nf (Continue												
	-	-	ρ	G															
		5.5	Sonic Drilling	NO CASING															
	- -	-	Sonic	9															
	-	-									ii								
	-6.0	6.0-		[6.1]															
	-	-				To Target Depth. Drillhole BH17-C006B terminated at													
	6.5	6.5-				6.1m.													
	-	-																	
	-	-																	
	7.0	7.0								i	iί								
	-	-																	
	-	-																	
	 -7.5	7.5—																	
	-	_																	
	8.0	8.0-																	
	- -	-								i	i i								
	- -	-																	
	8.5 	8.5-																	
	-	-																	
	9.0	9.0-																	
	-	-																	
	-	-								j	İ								
	9.5	9.5-																	
	-	-																	
		-								 									
Vote	es:	10.0																	
NOTE	es:																		

Contractor: Boart Longyear

BAFFINLAND GINT LIBRARY.GLB Log ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ «CDrawingFile» 13.092017 11.28

Notes:

BOREHOLE REPORT

BH17-C007

Sheet 1 of 1

127.40 m

Client: **Baffinland Iron Mines** Project No.: H352034

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

Datum: NAD83

Platform: Ground

Date Logged: 4/22/2017

Easting: 528,564.0 m Northing: 7,917,138.0 m

Surface Elevation: 132.00 m

Total Depth: 4.6 m Logged By:

Bottom Elevation:

AB

	Contra	ctor: E	oan	Lon	gyea	ır	RIG Type/ Mounting: WilniSonic Rig	Date L	ogg	jea	d: 4/22/2017		LC	gge	а ву	:			AB
L	Driller:	E	mile	and	or S	Sam	Hole Diameter (mm): 100	Date F	evi	ew	ved:6/8/2017		Re	view	ed E	Зу:			CH/WH
	Water Elevation (m)	Depth (m)	Method	Casing	o daga	GIAPING 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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	- - - - - 131. - - - 131.	0 1.	- - - - - - - - - - - - - - - - - -				ORGANIC SILT, some SAND: Brown sand, dark grey organics, some rootlets		*	X									
	— 130 — — 130 — — 130 — — 129	0 2.	Sonic Drilling	NO CASING			SILT and SAND, trace GRAVEL: Light brown, fine to coarse grained, well graded sand	Nbe Vc	*	X									
	- 129 		-				3.70 m to 4.60 m: Grey, fine grained	Vr Vs											
מוויי בינויסיים במלו וכר מכויביו וכרב		5 4.	-	[4.6			To Target Depth. Drillhole BH17-C007 terminated at 4.6m.		***************************************				14	10	37	53			-
F	127	J. 5.				_			_										

BOREHOLE REPORT

BH17-C010

Sheet 1 of 1

529,961.0 m

7,916,702.0 m

0.00 m

4.6 m

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Location:

Proposed Rail Alignment

Datum:

Bottom Elevation: -4.60 m

Platform: Ground

Total Depth:

Easting:

Northing:

Surface Elevation:

Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig Date Logged: 4/20/2017

Logged By: AΒ

Water Elevation (m)				or Sam	Hole Diameter (mm): 100		_		ed:6/8/2017		_		ed E				CH/WH
Water	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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
-	-				SAND, trace SILT, trace GRAVEL: Brown, very dense, fine to coarse grained sand, well graded	Nf											
	0.5-							X									
	1.0- - - -																
	1.5-					Nbe											
	2.0-	Sonic Drilling	NO CASING														
- 2.5 - - -	2.5— — —	So	N								14	1	88	11			
	3.0-					Nf											
	3.5— — —							X			15	0	90	9			
	4.0— — — —																
-4.5	4.5-		[4.6]		To Target Depth.												
-5.0	5.0				Drillhole BH17-C010 terminated at 4.6m.												

BOREHOLE REPORT

BH17-C011

Easting:

Northing:

Surface Elevation:

Bottom Elevation:

Sheet 1 of 1

Client: **Baffinland Iron Mines**

Project No.: H352034

Project:

Mary River Expansion Study Stage 2

NAD83

Location:

Proposed Rail Alignment

7,917,478.0 m 168.00 m 163.40 m

532,072.0 m

Platform: Ground

Datum:

Total Depth:

	Cont	tracto	or: Bo	art L	.ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	og	ged	l:	4/19/2017			d By				UK
	Drille	er:	En	nile a	and/	or San	Hole Diameter (mm): 100	Date R	evi	ew	ed:	6/8/2017	R	evie	wed	Ву:			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	0	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	-		-				SILTY SAND: Dark brown, organic	Nf											
	- - -	-167.5 -167.0					SILTY SAND, trace COBBLES: Brown, fine grained sand, rounded to subrounded cobbles	Nf		\times									-
	-	-166.5	1.5-				1.50 m to 3.0 m: No cobbles	Vs											+
	-		-				encountered	Vr											-
017 11:26	-	-166.0	2.0-	ВL	g														
GNMENT ALL_WITH ICE LOG_REV 3.GPJ < <drawingfile>> 13/09/2017 11:26</drawingfile>	-		- -	Sonic Drilling	NO CASING														-
l < <drawingf< td=""><td>-</td><td>-165.5</td><td>2.5-</td><td>o)</td><td>2</td><td></td><td></td><td></td><td></td><td>\bigotimes</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>†</td></drawingf<>	-	-165.5	2.5-	o)	2					\bigotimes									†
REV 3.GPJ	-	-165.0	3.0-																-
TH ICE LOG	-		-																-
IT ALL_WIT	F	-164.5	3.5-					Nbn											_
ALIGNME	-		- -																
HOLE RAIL	-	-164.0	4.0-							X			17	0	76	24			
IBRARY.GLB LOG ICE BOREHOLE RAIL ALI	F		-							M									
GLB Log		-163.5	4.5-		[4.6]														_
BRAR	-		-				To Target Depth. Drillhole BH17-C011 terminated at												

BAFFINLAND GINT LIBRARY.GLB | Notes:

Client:

BAFFINLAND GINT LIBRARY.GLB LOG ICE BOREHOLE RAIL ALIGNMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13/09/2017 11:26

BOREHOLE REPORT

BH17-C012

Sheet 1 of 1

533,228.0 m

Baffinland Iron Mines Project No.: H352034

Project: Mary River Expansion Study Stage 2 Datum: NAD83 Northing: 7,918,553.0 m
Surface Elevation: 182.66 m

Location:Proposed Rail AlignmentPlatform:GroundBottom Elevation:178.06 mTotal Depth:4.6 m

 Contractor:
 Boart Longyear
 Rig Type/ Mounting:
 MiniSonic Rig
 Date Logged:
 4/19/2017
 Logged By:
 UK

 Driller:
 Emile and/or Sam
 Hole Diameter (mm):
 100
 Date Reviewed:6/8/2017
 Reviewed By:
 CH/WH

	Oriller:	:	Em	nile a	and/	or Sar	n Hole Diameter (mm): 100	Date F	Revie	wed:6/8/2017		Re	view	ved I	Ву:			CH/WH	
10/0401	Vater Flevation (m)	Elevation (III)	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	100	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
	- - - - 18:	32.2	0.5-				SILTY SAND: Dark grey, fine grained sand	Nf											 - - - -
	- 18' - - -	31.7	1.0— - - - -																
	18 ⁻ 180	31.2	1.5					Vx											
	 - - -	30.2	2.5—	Sonic Drilling	NO CASING		ICE: White, cloudy texture	ICE											
	- 179 - - -	79.7	3.0				GRAVELLY SILT and SAND: Brown, fine grained sand; coarse, angular to sub-angular gravel	Nf											
	-	79.2	3.5—																- - - -
10.10.10.10.10.10.10.10.10.10.10.10.10.1	178 - - - -		4.0— — — — 4.5—		Mes							8	25	35	40				+
	- - - -	77.7	- - - 5.0-		[4.6]		To Target Depth. Drillhole BH17-C012 terminated at 4.6m.												- - - -
N	lotes:																		

BAFFINIAND GINT LIBRARY GLB Log ICE BOREHOLE RAIL ALIGNIMENT ALL_WITH ICE LOG_REV 3.GPJ <<DrawingFile>> 13.09/2017 11:26

BOREHOLE REPORT

BH17-C013

Client: **Baffinland Iron Mines** Project No.: H352034

Project: Mary River Expansion Study Stage 2

Location: Proposed Rail Alignment

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: Logged By:

	Con	tracto	or: Bo	art L	_ong	year	Rig Type/ Mounting: MiniSonic Rig	Date L	.ogg	jed:	: 4/18/2016	- 1	ogo.		-				4.6 m UK
	Drill	er:	Er	nile	and/	or San	Hole Diameter (mm): 100	Date F	Revi	ewe	ed:6/8/2017	F	Revi	ewe	ed B	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	Derrent Gravel	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	-	-181.7 -181.2					SAND and SILT, some GRAVEL: Brown, fine grained sand; coarse, sub-rounded to rounded gravel	Nf	,			14	4 1.	22 .	43	46			-
13/03/2017 11.20	-	-180.7 -180.2	1.5-	Sonic Drilling	CASING		ICE and SILTY SAND: Grey, fine grained sand, stratified to irregular oriented ice formation	ICE + SOIL		X									-
יייייייייייייייייייייייייייייייייייייי	-	-179.7 -179.2	- 2.5- - - - - 3.0-	Sonic	OON														-
	- - - -	-178.7	3.5-																- - - - - -
LB LOG ICE BUREHULE RAIL	- - -	-178.2 -177.7	4.0- - - - - 4.5-		[4.6]														-
בובונים: כ	-	= 177.2			[+.0]		To Target Depth. Drillhole BH17-C013 terminated at 4.6m.												
3	Note	s:	0.0																

HATCH LIBRARY V1.01.GLB Log ICE BOREHOLE KM 86 RAIL BRIDGE ABUTMENTS.GPJ <<DrawingFile>> 05/03/2018 16:27

Notes: Hole not located directly on abutment.

BOREHOLE REPORT

BH17-BR86-1

Sheet 1 of 4

Client: **Baffinland Iron Mines Corporation** Project No.: H353004

Project: Mary River Expansion Project

Location: North West Abutment

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

١,	Contra	cto	r: Bo	art L	.ona	vear	Rig Type/ Mounting: MiniSonic Rig	Date L	.oac	aed	l: 10/1/2017	1	otal E ogge	-				39.6 m R.S
	Oriller:				_	ndrew	Hole Diameter (mm): 100 mm				ed:2/10/2018		eviev					H.G
							Soil Description					_						11.0
20,40,40	Vater Flevation (m)		Depth (m)	Method	Casing	Graphic Log	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
	-		-			禁	Sandy GRAVEL, trace Silt: Brown.	unfrozen										
	- 141 -	1.9	1.0-				SAND, trace Silt: Brown to greyish-brown, medium to fine grained, well graded. Ice poor soil.	Nbn										-
	- 140 -	0.9	2.0-															
	- 138 - -	9.9	3.0-															-
	- 138 - -	8.9	4.0-															ļ
	- 137 - -	7.9	5.0— —				ICE	ICE										
	- 136	6.9	6.0-															-
	- - - 135	5.9	7.0-				SAND, trace Silt: Alternating layers of grey sand and brown silty sand, poorly graded, medium to fine grained. Ice poor soil.	Nbn										- - - - -
	- - -134 - -	4.9	8.0— - - -															- - - - -
	- 133 - - -	3.9	9.0-															- - - -
	132 	2.9	10.0-															 - - -
H	131	1.9 I	11.0		_	Harla.	1											

Project:

BOREHOLE REPORT

BH17-BR86-1

Sheet 2 of 4

Client: **Baffinland Iron Mines Corporation**

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

Co	ontracto	ctor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig Date Logged: 10/1/2017												R.S
Dr	iller:	Br	ent l	ИсА	ndrew	Hole Diameter (mm): 100 mm	Date Reviewed	! :2/10/2018	Re	viewe	l By:			H.G
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 Sample 1/ye	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Fines	Liquid Limit	Plastic Index	Other Tests
		- - 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— — — — — — — — — — — — — — — — — — —												+ - - - - -
		15.0— - - - - - 16.0—												-
														- - - - - -
	_ 124.9 _ _ _ _ _	- 18.0- - - -												- - - - - -
	123.9 	19.0-												
	- - 121.9 - -	21.0-												 - - - - - -
	120.9	22.0-												-

HATCH LIBRARY V1.01.GLB Log ICE BOREHOLE KM 86 RAIL BRIDGE ABUTMENTS.GPJ <<DrawingFile>> 05/03/2018 16:27

Notes: Hole not located directly on abutment.

Project:

Contractor: Boart Longyear

BOREHOLE REPORT

BH17-BR86-1

Sheet 3 of 4

Client: **Baffinland Iron Mines Corporation**

Mary River Expansion Project

Rig Type/ Mounting: MiniSonic Rig

Location: North West Abutment Project No.: H353004

Datum: NAD83

Platform: Ground

Date Logged: 10/1/2017

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

	Contrac	ior: BC	Jail L	Long	year	Rig Type/ Mounting: Minisonic Rig	Date Logged: 10/1/2017		Log	ggea	ву:				R.S	
-	Driller:	Br	ent N	VICA:	ndrew	Hole Diameter (mm): 100 mm	Date Reviewed: 2/10/2018		+ -	viewe	ed By	y:			H.G	
	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 Percentage Program Profile Content Pro	50	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
	- 119.1 - 119.1 - 118.1 - 117.3 - 116.1	24.0- - - - - - - - 25.0- - -				SAND, trace Silt: Alternating layers of grey sand and brown silty sand, poorly graded, medium to fine grained. Ice poor soil. (Continued)	Nbn (Continued)								-	
SCHIAMINGFIRES US/US/2016 16.2/	- - - - - - - - - - - - - - - - - - -	-													-	
NIM SO RAIL BRIDGE ABUTIMENTO.GPJ	—113.9 ————————————————————————————————————	30.0-	-			29.30m to 29.4m: Some fine gravel.									-	
RARY VI.UI.GLB LOG ICE BUREHULE	— 110.9 —— 109.9	32.0-													-	

HATCH LIBRARY V1.01.GLB Log ICE BOREHOLE KM 86 RAIL BRIDGE ABUTMENTS.GPJ <<DrawingFile>> 05/03/2018 16:27

Notes: Hole not located directly on abutment.

BOREHOLE REPORT

BH17-BR86-1

Sheet 4 of 4

Client: Baffinland Iron Mines Corporation Project No.: H353004 Easting: 542,257.3 m

Project: Mary River Expansion Project Datum: NAD83 Northing: 7,922,181.7 m

Surface Elevation: 142.93 m

Location:North West AbutmentPlatform:GroundBottom Elevation:103.33 mTotal Depth:39.6 m

Contractor:Boart LongyearRig Type/ Mounting:MiniSonic RigDate Logged:10/1/2017Logged By:R.SDriller:Brent McAndrewHole Diameter (mm):100 mmDate Reviewed: 2/10/2018Reviewed By:H.G

	Dri	ler:	Bre	ent N	ЛсAr	idrew	Hole Diameter (mm): 100 mm	Date F	levi	iew	ed:2/1	0/2018		Re۱	∕iew	ed E	By:			H.G
	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	Co	Moisture ontent Profile	50	rieid 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 (Continue	ed)											-
		- 107.9 - - -	35.0— - - - -				SAND, with SILT: Brown, fine grained. Ice poor soil.	Nbn												-
		106.9 	36.0— — — — — — — —				35.0m to 37.8m: Dark brownish-grey.													-
16:27		- - - - 104.9	38.0—				g),													-
< <drawingfile>> 05/03/2018 16:27</drawingfile>		- - - 103.9 -	39.0—																	-
ABUTMENTS.GPJ < <dre></dre>		- 102.9 - -	40.0— — —				To Target Depth. Drillhole BH17-BR86-1 terminated at 39.6m.				•									-
86 RAIL BRIDGE		- 101.9 - - -	41.0— - - - -																	-
RARY V1.01.GLB Log ICE BOREHOLE KM		—100.9 - - - - - -	42.0— — — — — 43.0—																	-
RARY V1.01.GLB 1	:	- - - -	- - - 44.0-																	-

Notes: Hole not located directly on abutment.

HATCH LIBRARY V1.01.GLB Log ICE BOREHOLE KM 86 RAIL BRIDGE ABUTMENTS.GPJ <<DrawingFile>> 05/03/2018 16:27

Project:

HATCH LIBRARY V1.01.GLB Log ICE BOREHOLE KM 86 RAIL BRIDGE ABUTMENTS.GPJ <<DrawingFile>> 05/03/2018 16:27

Notes: Hole is directly on North West Abutment.

BOREHOLE REPORT

BH17-BR86-2

Sheet 1 of 4

Client: **Baffinland Iron Mines Corporation**

Mary River Expansion Project

Location: North West Abutment Project No.: H353004

NAD83

Platform: Ground

Datum:

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

														Depti				39.6 m
9	Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig Date Logged: 10/26/2017											Lo	ogge	d By	:		U	.K and R.S
1	Orille	r:	Br	ent N	ИсAı	ndrew	Hole Diameter (mm): 100 mm	Date R	evie	we	d:2/10/2018	Re	eviev	wed I	Зу:			H.G
10/040	יישופו	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	Sample Lype	Moisture Content Profile 0 25 50	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
TOTAL INTEGER INTEGER THE TREATH		142.0 141.0 141.0 141.0 141.0 141.0 141.0		Method	Casing	Graphic	(size, grading, shape, roundness), colour,	Frozen Soil Description unfrozen Nbn Nbn	Recovery Sample Time	- Compa 1yd		14 23 18 37		72 93 91 91	2 7 9 5	Liquid Limi	Plastic Inde	Tests
	-1 -1 - - - -	133.0	10.0— - - - - - 11.0—									22	0	89	11			

Project:

Contractor: Boart Longyear

BOREHOLE REPORT

BH17-BR86-2

Sheet 2 of 4

Client: **Baffinland Iron Mines Corporation**

Mary River Expansion Project

Rig Type/ Mounting: MiniSonic Rig

Location: North West Abutment Project No.: H353004

Datum: NAD83

Platform: Ground

Date Logged: 10/26/2017

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

Dı	iller:	Bre	ent N	ЛсАr	ndrew	Hole Diameter (mm): 100 mm	Date R	evi	ewe	ed:2/10/2018		Re	view	ed E	Ву:			H.G	
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	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 (Continue	ed)				23						-	
	- - - 130.0	- - 13.0-																-	
	- - 129.0 -	- 14.0- - -																	-
		- 15.0 - -																	-
		16.0— — — —																-	-
	126.0 	17.0— — — — — — —																	
	- - - - -124.0	19.0-																-	-
	- - - -123.0	20.0-										22	0	90	10				
	- - 122.0 -	21.0—																-	-
	121.0	22.0																	Ė

HATCH LIBRARY V1.01.GLB Log ICE BOREHOLE KM 86 RAIL BRIDGE ABUTMENTS.GPJ <<DrawingFile>> 05/03/2018 16:27

Project:

Contractor: Boart Longyear

BOREHOLE REPORT

BH17-BR86-2

Sheet 3 of 4

Client: Baffinland Iron Mines Corporation

Mary River Expansion Project

Rig Type/ Mounting: MiniSonic Rig

Location: North West Abutment

Project No.: H353004

Datum: NAD83

Platform: Ground

Date Logged: 10/26/2017

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

	Contrac	tor: Bo	art L	ong	year	Rig Type/ Mounting: Minisonic Rig	Date Lo	99	ea:	10/26/2017	LC	ogge	а ву			U	.K and R.S
ļ	Driller:	Br	ent N	ИсА	ndrew	Hole Diameter (mm): 100 mm	Date Re	vie	we	ed:2/10/2018	Re	eviev	ved E	Зу:			H.G
	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	Necovery Commis Time	Sample I ype	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
		24.0-				SAND, trace to some Silt: Alternating layers of grey sand and brown silty-sand, poorly graded. Ice poor soil. (Continued)	Nbn (Continued	T			25						- - - - - - - - - - - - - - - - - - -
		-															
	——116.0 ————————————————————————————————————	-	-														-
		-									26						- - - - - - - -
200000000000000000000000000000000000000	- - - 112.(31.0-	-														- - - - - - - -
10000	—111.0 — — — ————110.0	-															

Notes: Hole is directly on North West Abutment.

HATCH LIBRARY V1.01.GLB Log ICE BOREHOLE KM 86 RAIL BRIDGE ABUTMENTS.GPJ <<DrawingFile>> 05/03/2018 16:27

Contractor: Boart Longyear

BOREHOLE REPORT

BH17-BR86-2

Client: **Baffinland Iron Mines Corporation** Project No.: H353004

Rig Type/ Mounting: MiniSonic Rig

Project: Mary River Expansion Project

Location: North West Abutment

Datum: NAD83

Platform: Ground

Date Logged: 10/26/2017

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

- ···				,	g - /pg		- 3.	J					-990				U	.N aliu N.
								ew	ed:2/10	0/2018		_	eviev	ved E	By:			H.0
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 ntent Profile	50	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Test
	34.0-				SAND, trace to some Silt: Alternating layers of grey sand and brown silty-sand, poorly graded. Ice poor soil. (Continued)	Nbn (Continue												
- - - - - - - - - - - - - - - - - - -	37.0-				37.4m to 39.3m: Trace Organics, dark brownish-grey to black, thin lenses of organics.							27						
	40.0-				SAND, and SILT: Brown, fine grained. \text{lce poor soil.} To Target Depth. Drillhole BH17-BR86-2 terminated at 39.6m.	Nbn				• 		25	0	61	39			
- - -102.0 - -	41.0-																	
	42.0-																	
—100.0 - - -	43.0																	

BOREHOLE REPORT

BH17-BR86-3

542.304.8 m

7,922,141.4 m

Client: **Baffinland Iron Mines Corporation**

South East Abutment

Project No.: H353004

Project:

Location:

Mary River Expansion Project

NAD83

Datum: Platform:

Ground

Bottom Elevation: Total Depth:

Logged By:

Surface Elevation:

Easting:

Northing:

103.78 m 39.6 m

143.38 m

Contractor: Boart Longyear

Rig Type/ Mounting: MiniSonic Rig

Date Logged: 10/22/2017

U.K Driller: Hole Diameter (mm): 100 mm Date Reviewed: 2/10/2018 Brent McAndrew Reviewed By: H.G (E) Field Water Conten Soil Description Elevation Ξ Moisture Percent Sand Graphic L Other Method ype Liquid Limit Casing TYPE; plasticity or particle characteristics Content Profile Depth (Frozen Soil **Tests** Water (size, grading, shape, roundness), colour, structure, accessory components. Description 0 25 50 SAND with Gravel, trace Silt: Brown. unfrozen 142.4 1.0 14 21 69 10 SAND, trace to some SILT: Brown and Nbn greysish- brown, medium to fine 2.0grained. Ice poor soil. 23 0 93 3.0 24 0 94 6 5.0 0 89 11 HATCH LIBRARY V1.01.GLB Log ICE BOREHOLE KM 86 RAIL BRIDGE ABUTMENTS.GPJ <<DrawingFile>> 05/03/2018 16:27 6.0 6.1m to 9.0m: Colour changes to uniform dark brown. 8.0 26 0 78 22 SAND, trace Silt: Alternating layers of Nbn grey sand and brown silty sand, poorly graded, medium to fine. Ice poor soil.

-133.4

10.0

Project:

Contractor: Boart Longyear

BOREHOLE REPORT

BH17-BR86-3

Client: **Baffinland Iron Mines Corporation**

Mary River Expansion Project

Rig Type/ Mounting: MiniSonic Rig

Location: South East Abutment Project No.: H353004

Datum: NAD83

Platform: Ground

Date Logged: 10/22/2017

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

				. 3		3 7, 3								99-	_,				0.10	
Dr	iller:	Bre	ent N	/IcAr	ndrew	Hole Diameter (mm): 100 mm	Date F	Revi	ew	ed:2/10/	/2018		_	view	ed E	Зу:			H.G	
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	Cont	Moisture tent Profile	50 —	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests	
		- - - 12.0- - -				SAND, trace Silt: Alternating layers of grey sand and brown silty sand, poorly graded, medium to fine. Ice poor soil. (Continued)	Nbn (Continue						26	0	93	7				
	130.4 	13.0— — — — — — — — 14.0— — —																		
		15.0— ———————————————————————————————————																		
	- - - - -126.4	17.0—				15.2m to 16.8m: Silty sand layers are dark brown.														
	125.4 	- 18.0— - - -																		
	124.4 	19.0— — — — — — —																		+
	- - - -122.4 -	21.0—																		
	121.4	22.0																		F

HATCH LIBRARY V1.01.GLB Log ICE BOREHOLE KM 86 RAIL BRIDGE ABUTMENTS.GPJ <<DrawingFile>> 05/03/2018 16:27

Location:

BOREHOLE REPORT

BH17-BR86-3

Sheet 3 of 4

Client: **Baffinland Iron Mines Corporation**

Project No.: H353004

Project: Mary River Expansion Project

> South East Abutment Platform:

Contractor: Boart Longyear Rig Type/ Mounting: MiniSonic Rig NAD83

Ground

Date Logged: 10/22/2017

Datum:

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: $\mathsf{U}.\mathsf{K}$

Di	iller:	Br	ent N	ЛсАr	ndrew	Hole Diameter (mm): 100 mm	Date Reviewed: 2/10/2	2018	Re	view	ed E	Ву:			H.G
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 Search Processing Page 17 Page 18	oisture ent Profile	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.									_
	- 	25.0- - - - - - 26.0-													-
	_ - - - 116.4	- - - 27.0-													
	_ _ 115.4 _ _ _	28.0—				27.4m to 30.5m: Colour changes to grey, layers are now light and dark grey.									-
	- 	29.0- - - - - 30.0-							25	0	92	8			
	- - - - -112.4	31.0-				SAND, trace SILT: Brown to grey. Ice poor soil.	Nbn		20	3	32	. 0			
	- - 111.4 - - -	32.0— - - - -													
=	110.4	33.0													

HATCH LIBRARY V1.01.GLB Log ICE BOREHOLE KM 86 RAIL BRIDGE ABUTMENTS.GPJ <<DrawingFile>> 05/03/2018 16:27

Project:

Contractor: Boart Longyear

BOREHOLE REPORT

BH17-BR86-3

Sheet 4 of 4

Client: Baffinland Iron Mines Corporation P

Mary River Expansion Project

Rig Type/ Mounting: MiniSonic Rig

Location: South East Abutment

Project No.: H353004

Datum: NAD83

Platform: Ground

Date Logged: 10/22/2017

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

-	ontiact	01. D0	uit L	Jong	ycui	rig Type/ Mounting. Williadine rig								lyeu	IJy.				U.K
D	riller:	Bre	ent N	ЛсАr	ndrew	Hole Diameter (mm): 100 mm	Date F	Revi	ev	vec	d:2/10/2018	_	$\overline{}$	iew	ed E	By:			H.G
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	0	Moisture Content Profile)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
		34.0—				SAND, trace SILT: Brown to grey. Ice poor soil. (Continued)	Nbn (Continue												
					**************************************	To Target Depth. Drillhole BH17-BR86-3 terminated at 39.6m.													

HATCH LIBRARY V1.01.GLB Log ICE BOREHOLE KM 86 RAIL BRIDGE ABUTMENTS.GPJ <-DrawingFile>> 05/03/2018 16:27



BOREHOLE REPORT

BH18-102-1

Client: Baffinland Iron Mine

Project No.: H353004

Easting: Northing: Surface Elevation:

Bottom Elevation:

555,763.0 m 7,915,435.0 m

Project:

Mary River Expansion Study

NAD83

168.00 m

Location:

Proposed Bridge 102 Abutment

Platform:

Datum:

158.35 m **Total Depth:**

Contractor: Boart Longyear

Rig Type/ Mounting: Sonic Drill Rig

Date Logged: 4/7/2018

9.7 m Logged By: YF/MY

١,	rill	or.	Br	ent N	ΛcΔr	drew	Hole Diameter (mm): 100	Date F	Pov	iow	od.					_ B	ovio	wed	B./-			1171
+			اں	S. IL IV	1071			Date	10 V		Ju.					Field Water Content	- AIG	weu l	Jy. □			
10/04	Vale	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	Moisture Content Profile O 25								Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Г	T					\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	PEAT: Frozen with roots.	Nf			T											
	-		-				GRAVEL: Two boulders.	INI														
	Ė	-167.0	1.0-			• () • • () • (GRAVELLY SAND with COBBLES: Brown.															
HATCH LIBRARY DEVELOPMENT COPY,GLB Log ICE BOREHOLE GINT LOGS MR 2018 GEOTECHNICAL INVESTIGATION - V7.GPJ < <drawngfile>> 29/08/2018 11:14</drawngfile>		-166.0 -165.0 -164.0 -162.0					Start of Coring at 1.3m. Continued on Rock Core Log sheet.															
SARY DEVELOPMENT O	-	-159.0 -158.0	9.0-									 										
HATCH LIBF	otes		.0.0																			



Baffinland Iron Mine

Mary River Expansion Study

Proposed Bridge 102 Abutment

Contractor: Boart Longyear Rig Type/ Mounting: Sonic Drill Rig Bearing: N/A°

Client:

Project:

Location:

BOREHOLE LOG

ROCK CORE FORMAT

Datum:

Platform:

Project No.: H353004

NAD83

Date Logged: 4/7/2018

BH18-102-1

Sheet 2 of 3

Easting:

555,763.0 m

Northing:

7,915,435.0 m 168.00 m

Surface Elevation: **Bottom Elevation:**

158.35 m

Total Depth:

9.7 m

Logged By:

YF/MY

Ι'	Contract	or. bo	arti	Long	year	rkig iyi	be/ Mounting: Sonic Drill Rig Bearing: N/A	D	ate Logged:	4///201	0	LO	gged	D BY: YF/MY
L	Driller:	Br	ent I	VICA:	ndrew	Hole Di	ameter (mm): 100 Plunge: °	D	ate Checked	:		Rev	/iew	red By:
14/-4-:	vvater 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 표チェヌュヺ급	Is ₍₅₀₎ [UCS] MPa	Defect Spacing mm [001] 09- 00007	RQD %	Defect Log	Defect Description Inclination, type, infill, amount, aperture, planarity, roughness, frequency Specific General
Г	-	-								-				
	- - - 167.0	1.0 —					Resuming in Rock Core Format 1.3m.			- - - -				
2	- - - 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.			- - - - -				
3/00/20 10 11:	_ —165.0	3.0 —					2.09 m - 2.31 m: Fractured area. 2.31 m - 2.91 m: Becoming coarser grained.			- - -				
GP3 << DIAWINGFIIE </td <td>- - - 164.0 -</td> <td>4.0 —</td> <td></td> <td></td> <td>~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~</td> <td></td> <td>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.</td> <td></td> <td></td> <td>- - - - -</td> <td></td> <td></td> <td></td> <td></td>	- - - 164.0 -	4.0 —			~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~		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.			- - - - -				
A - NOTING	- - 163.0	5.0 —					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,			- - -				
O ECHNICAL INVE	- - - 162.0	6.0 —					pink, fractured zone. 4.85 m - 4.96 m: Possibly chloritized, 2 mm vein, medium grained, medium strong.			- - - -				
GINT LOGS MIN 2010 GE	- - - 161.0 -	7.0 —					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.			- - - - -				
D BONEHOLE	160.0	8.0 —					5.26 m - 6.01 m: Trace potassium feldspar banding, quartz rich, strong grey, fine. 6.06 m - 6.36 m: Quartzo feldspar with			- - -				
NI COPT.GLB LOG CORE	- - 159.0 - -	9.0			``````````````````````````````````````		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.			- - - - -				
	158.0	10.0 —					8.26 m - 8.30 m: Possible clay zone,			-				

HATCH LIBRARY DEVELOPMENT COPY, GLB Log CORED BOREHOLE GINT LOGS MR 2018 GEOTECHNICAL INVESTIGATION - V7. GPJ <-DrawingFile>> 29/08/2018 11:10

Notes:

Defect Description Legend

<u>Planarity</u> Planar Irregular Curved Undulose Stepped

<u>Type</u> DI Jt Pt Sh Cs Drilling Induced Joint Cz
Parting on Contact Fz
Shear Seam Banc
Crushed Seam

Seam Crushed Zone Fractured Zone Weak Band Band

Roughness Rough Smooth Polished Slickenside Ro

Infill Amount Clean Stained Veneer Coating cg



S

Client:

Project:

n (m)

BOREHOLE LOG

ROCK CORE FORMAT

BH18-102-1

Sheet 3 of 3

Easting:

555,763.0 m

Northing:

7,915,435.0 m 168.00 m

Surface Elevation: **Bottom Elevation:**

158.35 m

Total Depth:

9.7 m YF/MY

Logged By:

Reviewed By:

Location: Proposed Bridge 102 Abutment

Mary River Expansion Study

Baffinland Iron Mine

ical

Platform:

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

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

> **Rock Description** ROCK TYPE:

ng/ tion

Datum:

Estimated

Project No.: H353004

NAD83

Is₍₅₀₎

Defect Spacing

Defect Description

Water	Elevation	Depth (m	Method	Run #/TC	Graphic L	Geologi Unit	ROCK TYPE; Grain size, texture and fabric, colour, general defect conditions, minor constituents.	Weathering Cementation	Stren		[UCS] MPa	2000 600 200 [100] B E	RQD %	Defect Log	Inclination, type, infill, amount, aperture, planarity, roughness, frequency
	- - - - -157.0	- - -					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.		S I Z	7 7 7	- - - - -	20 60 60 60 60 60 60 60 60 60 60 60 60 60	R		Specific General
	_ 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 —									- - -				
0	_ _ 149.0 _	19.0 —									- - - -				
	148.0	20.0									-				

Notes:

HATCH LIBRARY DEVELOPMENT COPY.GLB Log CORED BOREHOLE GINT LOGS MR 2018 GEOTECHNICAL INVESTIGATION - V7.GPJ <-DrawingFile>> 29/08/2018 11:10

Defect Description Legend

<u>Planarity</u>

Planar Irregular Curved Undulose Stepped

<u>Type</u> DI Jt Pt Sh Cs Drilling Induced Joint Cz Parting on Contact Fz Shear Seam Crushed Seam

Seam Crushed Zone Fractured Zone Weak Band Sm Band

Roughness Rough Smooth Polished Slickenside Ro

Infill Amount Clean Stained Veneer Coating cn sn vn

cg

BOREHOLE REPORT

BH18-102-2

555.674.0 m

7,915,409.0 m

166.00 m

149.10 m

Client: Baffinland Iron Mine Project No.: H353004

Project: Mary River Expansion Study Datum: NAD83

Location: Proposed Bridge 102 Abutment Platform:

Total Depth:

Easting:

Northing:

Surface Elevation:

Bottom Elevation:

16.9 m Logged By:

Contractor: Boart Longyear Rig Type/ Mounting: Sonic Drill Rig Date Logged: 4/8/2018 YF/MY Driller: **Brent McAndrew** Hole Diameter (mm): 100 Date Reviewed: Reviewed By: (E Water Conten Soil Description Elevation Moisture Ξ Graphic L Percent Sand Other Plastic Index Method ype Liquid Limit Casing TYPE; plasticity or particle characteristics Content Profile Depth (Frozen Soil Water Tests (size, grading, shape, roundness), colour, structure, accessory components. Description Sample 0 25 50 Field SAND and GRAVEL: Medium grained Nf sand, brown, slightly moist. inferred GRAVELLY SAND, trace BOULDERS: · O inferred Fine sand, possible boulder dust. 0.0 -165.0 1.0-۰ () ۰ o. 0 GRAVELLY SAND, trace SILT: Medium Nf 2.0 ۰ 0٬ to coarse grained, brownish grey to inferred 0 0 brown, subrounded to subangular. ۰ () ه , O (-163.0 3.0 69 ۰ 0 ο .t 3.40 m and 3.70 m: Cobbles -162.0 4.0 SAND, some GRAVEL, trace SILT: Nf Medium to fine grained, brownish grey. inferred 4.70 m: Inferred boulder. --161.0 5.0-5.00 m and 5.30 m: Cobble. GRAVEL to COBBLES: Mixed igneous / metamorphic, washed. 6.0-5.6m: Organic / sulfur layer. -159.0 7.0--158.0 8.0-Start of Coring at 8.7m. -- 157.0 Continued on Rock Core Log sheet.

HATCH LIBRARY DEVELOPMENT COPY.GLB Log ICE BOREHOLE GINT LOGS MR 2018 GEOTECHNICAL INVESTIGATION - V7.GPJ <<DrawingFile>> 29/08/2018 11:14 Notes:



BOREHOLE LOG

ROCK CORE FORMAT

Client: Baffinland Iron Mine Project No.: H353004

Project: Mary River Expansion Study Datum: NAD83

Location: Proposed Bridge 102 Abutment Platform:

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: Reviewed Bv:

BH18-102-2

Sheet 2 of 3

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

Dr	iller:	Br	ent N	∕lcAn	drew l	Hole Di	ameter (mm): 100 Plunge: °	D	Date	Che	ecked	1:		Re	view	red By:
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	E ;	Strer	ated ngth	Is ₍₅₀₎ [UCS] MPa	Defect Spacing mm [0001]	RQD %	Defect Log	Defect Description Inclination, type, infill, amount, aperture, planarity, roughness, frequency Specific General
		1.0 —										-				
:10	164.0 	2.0 —										-				
ED BOREHOLE GINT LOGS MR 2018 GEOTECHNICAL INVESTIGATION - V7.GPJ <-DrawingFile>> 29/08/2018 11:10	163.0 	3.0 —										- - -				
√- V7.GPJ < <drawing< td=""><td>162.0 </td><td>4.0 —</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td></drawing<>	162.0 	4.0 —										-				
CAL INVESTIGATION	161.0 _ _ _ _ _	5.0										-				
IR 2018 GEOTECHNI	160.0 	6.0										-				
EHOLE GINT LOGS N	159.0 	- - -										-				
B Log CORED BORE	—158.0 - - - - - - - - - - - - -	- - -		9 / 135	, ~ ,		Resuming in Rock Core Format 8.7m. BEDROCK: Gneiss, visible medium to coarse grains, red, black, and grey,					-		77		Fz
LOPMENT COPY.GL	- - - - - - 156.0	- - -		/6	\`\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		strong to very strong.					-	-	22		DI DI -10° Jt PI Sm -20° Jt PI Sm Red stains sn Fz
HATCH LIBRARY DEVELOPMENT COPY.GLB Log COR	tes:						Defect Planarity Description Ir Irregular Legend Un Undulose St Stepped	Jt . Pt I Sh :	Drillin Joint Parti Shea	ng or ar Sea	luced Conta am Seam	Cz C act Fz Fi	eam rushed Zone ractured Zone eak Band		Ro Sm Po SI	ughness Infill Amount Rough cn Clean Smooth sn Stained Polished vn Veneer Slickenside cg Coating



Baffinland Iron Mine

Mary River Expansion Study

Proposed Bridge 102 Abutment

Client:

Project:

Location:

BOREHOLE LOG

ROCK CORE FORMAT

BH18-102-2

Sheet 3 of 3

Easting:

555,674.0 m

Northing:

7,915,409.0 m

Bottom Elevation:

Surface Elevation:

166.00 m 149.10 m

Total Depth:

16.9 m

Logged By:

YF/MY

Contractor: Boart Longyear Rig Type/ Mounting: Sonic Drill Rig Bearing: N/A° Date Logged: 4/8/2018 Brent McAndrew Hole Diameter (mm): 100 Plunge: Date Checked: Reviewed By:

Platform:

Datum:

Project No.: H353004

NAD83

	Dril	ler:	Br	ent N	ИсАr	ndrew	Hole Di	ameter (mm): 100 Plunge: °	D	ate Checked	:		Re	view	ved By:
		(m)			0	go	-	Rock Description		F-4i-		Defect			Defect Description
	Water	Elevation (m)	Depth (m)	Method	Run #/TCR	Graphic Log	Geological Unit	ROCK TYPE; Grain size, texture and fabric, colour, general defect conditions, minor constituents.	Weathering/ Cementation	Estimated Strength	Is ₍₅₀₎ [UCS] MPa	Spacing mm [100]	RQD %	Defect Log	Inclination, type, infill, amount, aperture, planarity, roughness, frequency Specific General
		-	-		10 / 98			BEDROCK: Gneiss, visible medium to coarse grains, red, black, and grey, strong to very strong. (Continued)			- - -		22		
	-	155.0 	11.0 — - -		11 / 76			10.90 m: Possible porphyriticm, no gneissic banding.			 - -		43	1	Cz —90° Jt PI Sm —40° Jt Cu Sm —70° Jt PI Sm Orange stains sn
	-	- 154.0 - -	12.0 — -		12 / 115						- -		87	1	LDI 75° Jt PI Sm Fz —45° Jt PI Sm Rust staining sn Fz
> 29/08/2018 11:10	-	- - 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.			- - - -		99		_DI √30° Jt PI Sm sn −80° Jt PI Sn cg −50° Jt PI Sm cg Fz
BOREHOLE GINT LOGS MR 2018 GEOTECHNICAL INVESTIGATION - V7.GPJ < <drawingfile>> 29/08/2018 11:10</drawingfile>	-	- - 152.0 -	- 14.0 — -		14/91			13.70 m: Minor gneissic banding, becoming iron stained, black, weak.			- - - -		49		−20° Jt PI Sm ∼75° Jt Cu Ro Rust stain, silt infill sn −DI −70° Jt Cu Sm Rusty infill sn FZ
NVESTIGATION - V7.	-	- - 151.0 - -	- 15.0 — -		15/117 14						- - - -		40		
GEOTECHNICAL II	-	- - 150.0 - -	16.0 —		16 / 106 15			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
INT LOGS MR 2018		- - 149.0 - -	17.0 —					To Target Depth. Drillhole BH18-102-2 terminated at 16.9m.			- - -				45° Jt PI Sm Infill cg \80° Jt PI Sm Rusty sn \DI \50° Jt Cu Sm
	-	- - 148.0 -	- 18.0 — -								- - - -				
COPY.GLB Log CO.	-	- - 147.0 -	19.0 —								- - - -				
VELOPMENT C	Note	- - - 146.0	20.0								-				150.5
HATCH LIBRARY DEVELOPMENT COPY.GLB Log CORED	Note							Defect Pl Planarity Description Fl Planar Legend Fl Planar Cu Curved Un Undulose St Stepped	Jt S Pt F Sh S	Drilling Induced Joint Parting on Contac Shear Seam Crushed Seam	Cz Ci ct Fz Fr	eam ushed Zone actured Zone eak Band	'	Ro Sm Po SI	ughness Infill Amount Rough cn Clean Smooth sn Stained Polished vn Veneer Slickenside cg Coating

BOREHOLE REPORT

BH18-BR15-1

Sheet 1 of 3

Client: Baffinland Iron Mine

Project No.: H353004

Project:

Mary River Expansion Study

NAD83

Surface Elevation:

Easting:

Northing:

7,915,441.0 m 78.00 m

555,758.0 m

Location: Bridge 15 (Kilometer 18)

Bottom Elevation: 60.63 m

Platform:

Datum:

Total Depth: 17.4 m

-	ller:	Di	UII.	VICAI	ndrew	Hole Diameter (mm): 100	Date F	(ev	- W	eu	•			viev	veu I	Jу.			
	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	0	Moisture Content Profile	0	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Tests
	-					SNOW	ICE												
	-	-				ICE	ICE												
	 77.0	1.0-																	
	-	-				SILTY SAND, some GRAVEL: fine to medium grained sand, brownish grey.	Nf inferred		N										
	—76.0 —	2.0-					Possible												
	-	-	-		901		ice feature,						6	34	44	22			
	- 75.0	3.0-					all melted.		7				Ö	34	44	22			
	-	-			o p														
	- - 74.0	4.0-											11	6	57	37			
		4.0-			9 0	4.20 m - 4.30 m: Boulder inferred with									01	31			
	-	-				silty sand layer.													
	—-73.0 —	5.0-									•		7						
	-	-																	
	- 72.0	6.0-			P D														
	-	-																	
	- 71.0	7.0-			000														
	-	-	1		101	COBBLES and BOULDERS: Cobble at	_												
	-	-	100		3	7.75 m and 8.90 m.													
	—70.0 —	8.0-	Rig BL		9														
	-	-	Drilling								iii								
	 69.0 	9.0-	Mini Sonic Drilling Rig BL100		1916	MUD SLURRY with GRAVEL to COBBLES: Coarse gravel (26 mm).	Nf inferred												
	-		≥		0 0 0	SSSEES. Socios gravor (20 mm).	Illioned												



BOREHOLE REPORT

BH18-BR15-1

Sheet 2 of 3

Client: Baffinland Iron Mine

Project No.: H353004

Project:

Location:

Mary River Expansion Study

Bridge 15 (Kilometer 18)

NAD83

Surface Elevation:

7,915,441.0 m 78.00 m

555,758.0 m

Platform:

Bottom Elevation:

60.63 m

Contractor: Boart Longyear

Rig Type/ Mounting: Sonic Drill Rig

Date Logged: 3/11/2018

Datum:

Total Depth: 17.4 m Logged By: MY/PS

Easting:

Northing:

	Dril	ller:	Bre	ent N	/lcAr	ndrew	Hole Diameter (mm): 100	Date F	Revi	ew	ed:				Re	view	ed E	Зу:			
	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	0	N Cont	Noisture tent Profile	50	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
HATCH LIBRARY DEVELOPMENT COPY GLB Log ICE BOREHOLE GINT LOGS MR 2018 GEOTECHNICAL INVESTIGATION - V7.GPJ < <drawingfile>> 29/08/2018 11:14</drawingfile>	Wate		11.0— 12.0— 13.0— 14.0— 15.0— 16.0— 17.0— 18.0— 18.0— 18.0— 18.0— 18.0— 18.0— 18.0— 18.0— 18.0— 18.0— 18.0— 18.0— 18.0— 18.0—	Meth	Casir		(size, grading, shape, roundness), colour, structure, accessory components.	Description	Recovery	Sample T				50	Field W	Percent	Percent	Percent	T Liquid L	Plastic	rests
LIBRARY DEVELOPMENT CO	Niete		19.0-																		
НАТСН	Note	35.																			



Baffinland Iron Mine

Mary River Expansion Study

Bridge 15 (Kilometer 18)

Client:

Project:

Location:

BOREHOLE LOG

ROCK CORE FORMAT

Datum:

Platform:

Project No.: H353004

NAD83

BH18-BR15-1

Sheet 3 of 3

Easting:

555,758.0 m

Northing:

7,915,441.0 m

Surface Elevation:

78.00 m 60.63 m

Bottom Elevation: Total Depth:

17.4 m

MY/PS

Contractor: Boart Longyear Rig Type/ Mounting: Sonic Drill Rig Bearing: N/A° **Date Logged:** 3/11/2018 Logged By: Driller: Brent McAndrew Hole Diameter (mm): 100 Date Checked: Plunge: Reviewed By:

	ilici.						ameter (mm). 100 mange.		ate Offeckeu	-				лец Бу.
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 표天고동그렇급	Is ₍₅₀₎ [UCS] MPa	Defect Spacing mm [007.000 0000 000.000 000.000 000.000 000.000 000.000 000.000 000.000 000.00	RQD %	Defect Log	Defect Description Inclination, type, infill, amount, aperture, planarity, roughness, frequency Specific General
	- - - - - 67.0	- - - - 11.0 —		1 / 130	,		Resuming in Rock Core Format 10.7m. BEDROCK: Granitic gneiss alternating with mafic bands.			- - - -		52		- Fz 3° Jt PI Sm 5° Jt PI Sm
11:10	- - - 66.0 - -	12.0 —		2 / 105			12.58 m: Mafic matrix with white			- - - -		92		DI 40° Jt PI Sm 10° Jt PI Sm cg 90° Jt PI Sm 85° Jt PI Sm 90° Jt PI Ro 90° Jt PI Ro 75° Jt PI Sm
HATCH LIBRARY DE/ELOPMENT COPY.GLB Log CORED BOREHOLE GINT LOGS MR 2018 GEOTECHNICAL INVESTIGATION - V7.GPJ < <drawngfile>> 29(08/2018 11:10)</drawngfile>	- 65.0 64.0	-		154 3 / 96			minerals peppered throughout, medium grain size.			- - - -		43		Fz 0° Jt PI Sm Soil cg Cz 30° Jt PI Ro Rust staining sn 80° Jt PI Ro Rust staining sn 90° Jt PI Ro Rust staining sn 45° Jt PI Ro Rust st
INVESTIGATION - V7.GPJ	- - - 63.0	- - 15.0 — - -	-	5/101 4/1			14.80 m - 15.85 m: Dark mafic to ultramafic matrix, black visable minerals.			- - - - -		86 92		\\ 30° \text{.if PI} \\ 30° \text{.if PI Sm Darker staining} \\ 0° \text{.if PI Sm} \\ 45° \text{.if PI Sm} \\ 45° \text{.if PI Sm} \\ -70° \text{.if PI Sm} \\ \text{-000} \\ 100 \\ 10
S MR 2018 GEOTECHNICAL	- 62.0 61.0	16.0 — - - - 17.0 —	-	66 / 9			15.85 m - 15.95 m: Granitic gneiss. 15.95 m - 17.22 m: Mafic matrix.			- - - - -		96		– DI ∼45° Jt PI Sm
RED BOREHOLE GINT LOG	_ _ _ _ _ 60.0	18.0 —			~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~		17.22 m: Mafic matrix with red banding, granitic gneiss. To Target Depth. Drillhole BH18-BR15-1 terminated at 17.4m.			- - - -				_45° Jt PI Sm Some staining, infill cg DI _40° Jt PI Sm Staining sn
MENT COPY.GLB Log CUI	_ _ 59.0 _ _	19.0 — - - - -								- - - -				
HATCH LIBRARY DEVELOPING		20.0 —					Defect Planarity Description Ir Iregular Legend Cu Curved Un Undulose St Stepped	Jt J Pt F Sh S	Orilling Induced Joint Parting on Contar Shear Seam Crushed Seam	Cz Cı ct Fz Fı	eam rushed Zone actured Zone eak Band		Ro Sm Po SI	Rough cn Clean Smooth sn Stained Polished vn Veneer Slickenside cg Coating

HATCH LIBRARY DEVELOPMENT COPY.GLB Log ICE BOREHOLE GINT LOGS MR 2018 GEOTECHNICAL INVESTIGATION - V7.GPJ < <DrawingFile>> 29/08/2018 11:14

Notes:

BOREHOLE REPORT

BH18-BR15-2

Sheet 1 of 3

Client: Baffinland Iron Mine Project No.: H353004

Project: Mary River Expansion Study

Location: Bridge 15 (Kilometer 18) 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

١.						D. T. (M. 4) O : D : II D:	5			0/40/0040		1	tal E	-				16.8 m
۱,	Contrac	tor: Bo	art L	ong	year	Rig Type/ Mounting: Sonic Drill Rig	Date L	.ogg	jed:	: 3/12/2018		Lo	gge	d By	:			MY/PS
1	Oriller:	Br	ent N	ИсА	ndrew	Hole Diameter (mm): 100	Date F	Revi	ewe	ed:		Re	view	ed E	Зу:			
10101	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	50	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
	- - - -77.0 - - - - -76.0	1.0-				BOULDERS to COBBLES: Grey with red viens. SAND, trace SILT: Fine to medium grained, light brown, red, and black. SANDY SILT: Grey. SILTY SAND, trace to some GRAVEL: Fine to medium grained, brownish grey.	Nf Nbn - Vx				>>•	14 63 9	1 1 29	85 45 39	14 54			- - - - - - - - - - - - - - - - - - -
	- -75.0 - - - - -74.0 - - - -	3.0- - - - - 4.0- - - - - -				3.90 m: Trace boulders, sub-rounded to rounded gravel and boulders.	Nf Nf inferred					11	14	60	26			- - - - - - - - -
	- - - - -72.0 - - - - - -	6.0-				5.20 m: Some gravel, trace boulders.			K/	•		5	22	48	30			- - - - - - - - -
	- - - -70.0 - - - - - - -69.0	8.0— 	Mini Sonic Drilling Rig BL100			7.80 m: Trace cobbles. 8.50 m - 8.70 m: Trace boulders, coarsening downwards, sub-angular to sub-rounded.												- - - - - - - -
	68.0	-				9.45 m - 9.80 m: Boulders, dark matrix with granitic crystals.	Nf											-



Project:

BOREHOLE REPORT

BH18-BR15-2

Sheet 2 of 3

Client: Baffinland Iron Mine

Location: Bridge 15 (Kilometer 18)

Mary River Expansion Study

Project No.: H353004

NAD83

Platform:

Datum:

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

	0	4	D	41			Die Terrel Manustiner Carie Dell Die	Dete I			- 0/40/0040			otal E					16.8 m
	Contra						Rig Type/ Mounting: Sonic Drill Rig				: 3/12/2018			gge					MY/PS
L	Driller	:	Bre	ent N	/lcAr	drew	Hole Diameter (mm): 100	Date R	evie	w	ed:		_	eview	ved E	Зу:			
	Water	Elevation (III)	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	Moistu Content P	rofile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
t		\dashv					10.00 m - 10.15 m: Boulders, dark		1	1									
	F		4				matrix with granitic crystals.	/			ii	i							_
	F		+				Start of Coring at 10.2m. Continued on Rock Core Log sheet.					i							-
	67	7.0	11.0				Communication Noon Core Log Sheet.					l I							1
	F		+																-
	Ĺ		1																
	-		+																-
	-66	3.0	12.0																1
	-		4																-
			1								ii	i							
2	65	5.0	13.0								ii	i							+
3	Ė		1																
	-		4									l I							-
2	١.																		-
	64	+.0	14.0																Ţ
5	F		+																-
5	F		1																
5	63	3.0	15.0																+
			1								ii	i							
5	-		-								ii	i							-
	-62	2.0	16.0									İ							
	-		+								1 1	l I							-
	Ė		1																
	-		+									ļ							-
	-6	1.0	17.0									ļ							†
	-		+																-
	t																		
	60	0.0	18.0																+
9	F		1								jj	j							E
3	-		+								ii	i							-
3	59	,	19.0																Ţ
	-		.3.0									 							Ŧ
	F		}																-
1	F		7									ļ							-
E	58	3.0	20.0							<u> </u>							<u> </u>		

HATCH LIBRARY DEVELOPMENT COPY.GLB Log ICE BOREHOLE GINT LOGS MR 2018 GEOTECHNICAL INVESTIGATION - V7.GPJ <-DrawingFile>> 29/08/2018 11:14

Notes:



Baffinland Iron Mine

Brent McAndrew Hole Diameter (mm): 100

Client:

Driller:

BOREHOLE LOG

ROCK CORE FORMAT

Project No.: H353004

Project: Mary River Expansion Study Datum: NAD83

Location: Bridge 15 (Kilometer 18) Platform:

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

Plunge:

Date Checked:

BH18-BR15-2

Sheet 3 of 3

78.00 m

Easting: 514,211.0 m

Northing: 7,965,645.0 m Surface Elevation:

Bottom Elevation: 61.20 m

Total Depth: 16.8 m Logged By: MY/PS

Reviewed By:

<u> </u>	Jrii	iei.	ы	enti	VICAI	larew	noie Di	ameter (mm): 100 Plunge:	L	ate Che	ckeu	•			Re	view	red By:	
Motor	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, Resuming MiROCKOCONIE Followat 10.2m.	Weathering/ Cementation	Estima Streng ≟ + ± ≥ -	gth	Is ₍₅₀₎ [UCS] MPa	Spa n	efect acing nm [001]	ROD %	Defect Log	Inclinat amount, a	Description ion, type, infill, perture, planarity, sess, frequency Genera
		-	-			, , , ,		BEDROCK: Granitic gneiss, grey matrix with red veins.				-						
	-	- 67.0 -	11.0 —					10.70 m - 11.10 m: mafic matrix with plagioclase and granitic banding (gneissic banding).				-		 				
		- - - 66.0	12.0 —					Crushed rock, up to 30 cm.				-						
11:10		-	- -									- - -						
29/08/2018		- 65.0 -	13.0 —									- - -						
J < <drawingfile>></drawingfile>	-	- - — 64.0 -	- 14.0 —					13.70 m - 13.85 m: Pulverized rock.				- - -						
IGATION - V7.GP		- - - 63.0	15.0 —									- - -						
HATCH LIBRARY DEVELOPMENT COPY.GLB Log CORED BOREHOLE GINT LOGS MR 2018 GEOTECHNICAL INVESTIGATION - V7.GPJ < <drawngfile>> 29/08/2018 11:10 Z III</drawngfile>		- - - 62.0 -	- - 16.0 — -					15.50 m: Thicker plagioclase beds, thicker clasts (granite)				- - - -						
SINT LOGS MR 2018	-	- - 61.0 -	- 17.0 — -			~		To Target Depth. Drillhole BH18-BR15-2 terminated at 16.8m.				- -						
RED BOREHOLE	-	- - 60.0	18.0 — -									- - -						
OPY.GLB Log CO		- - 59.0 -	19.0 —									- - - -						
ELOPMENT C		- - - 58.0	20.0									-		ii I				
HATCH LIBRARY DEV	lote	es:						Defect Planarity Description Legend Un Undulose St Stepped	Jt . Pt I Sh :	Orilling Indu Joint Parting on (Shear Sean Crushed Se	Contac	Cz Cr	acture	I Zone d Zone and	•	Ro Sm Po SI	ughness Rough Smooth Polished Slickenside	Infill Amount cn Clean sn Stained vn Veneer cg Coating

BOREHOLE REPORT

BH18-BR70-1

Sheet 1 of 5

Client: Baffinland Iron Mine

Project No.: H353004

Easting: 529,138.0 m **Northing:** 7,916,667.0 m

Project: Mary River Expansion Study

NAD83

 Northing:
 7,916,667.0 m

 Surface Elevation:
 124.00 m

91.50 m

Location: Proposed Bridge 70 Abutment

Platform:

Datum:

Total Depth: 32.5 m

Contractor: Boart Longyear Rig Type/ Mounting: Sonic Drill Rig

Date Logged: 4/13/2018

Logged By: YF/MY

Bottom Elevation:

riller:	Bre	nt M	cAn	drew	Hole Diameter (mm): 100	Date F	Revi	iew	ed:	_	evie	wed	Ву:			
Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description TYPE; plasticity or particle characteristics (size, grading, shape, roundness), colour, structure, accessory components.	Description	Recovery	Sample Type	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
- - - - -123.0	1.0—				SILTY SAND: Greyish brown, fine to medium grained.	Nbn										
- - - 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			
	4.0				4.20 m: Micaceous minerals, organics.	Vs										
118.0 	6.0-					Nbn										
—117.0 - - - - - - -116.0	7.0-				7.60 m: Interbedded silt and organic layers, pungent organics.	Vr to Vx				28	0	80	20			
- - 115.0 -	9.0-				ICE and SOIL: Silt, trace sand, grey.	I+S				36	0	3	97			

BOREHOLE REPORT

BH18-BR70-1

Client: Baffinland Iron Mine

Project No.: H353004

Project:

Mary River Expansion Study

Datum: NAD83 Surface Elevation: **Bottom Elevation:**

Easting:

Northing:

7,916,667.0 m 124.00 m

91.50 m

YF/MY

529.138.0 m

Location: Proposed Bridge 70 Abutment

Platform:

Total Depth: 32.5 m

Contractor: Boart Longyear

Rig Type/ Mounting: Sonic Drill Rig

19.80 m - 21.70 m: Trace to some

Date Logged: 4/13/2018

Logged By:

Driller: **Brent McAndrew** Hole Diameter (mm): 100 Date Reviewed: Reviewed By: (E Soil Description Elevation Moisture Ξ Graphic L Percent Sand Other Water (Method ype Casing TYPE; plasticity or particle characteristics Content Profile Depth (Frozen Soil Tests Water (size, grading, shape, roundness), colour, structure, accessory components. Description 0 25 50 Field ICE and SOIL: Silt, trace sand, grey. I+S (Continued) (Continued) SILTY SAND: Brownish grey, stratified, Nbn possible laminated organics. -113.0 11.0 11.30 m - 11.45 m: Clay layers. 19 0 39 61 11.80 m - 12.00 m: Inferred boulder. 12.0 12.25 m - 12.30 m: Trace gravel, grey. HATCH LIBRARY DEVELOPMENT COPY.GLB Log ICE BOREHOLE GINT LOGS MR 2018 GEOTECHNICAL INVESTIGATION - V7.GPJ <<DrawingFile>> 29/08/2018 11:14 12.70 m - 13.05 m: Inferred boulder. 13.0 -111.0 13.30 m: Cobbles. SANDY SILT, trace GRAVEL: Grey. Nbn -110.0 14.0-9 51 15 15.0-15.20 m, 16.40 m: Cobbles, greyish brown. 16.0 19 26 55 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: Nbn Grey, coarse grained sand. inferred 19.0-

Notes:

HATCH LIBRARY DEVELOPMENT COPY.GLB Log ICE BOREHOLE GINT LOGS MR 2018 GEOTECHNICAL INVESTIGATION - V7.GPJ <-DrawingFile>> 29/08/2018 11:14

BOREHOLE REPORT

BH18-BR70-1

Sheet 3 of 5

Client: Baffinland Iron Mine Project No.: H353004

Project: Mary River Expansion Study

Location: Proposed Bridge 70 Abutment 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

Co	Contractor: Boart Longyear					Rig Type/ Mounting: Sonic Drill Rig	Date Logged:	gged: 4/13/2018 Logged By:								
Dr	iller:	Br	ent l	AoN	ndrew	Hole Diameter (mm): 100	Date Reviewed	i:	Re	view						
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 Sample Type	Moisture Content Profile	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. BEDROCK (Inferred): Rock dust.									- - - - - -	
	- - - - -100.0	24.0-													- - - - - -	
	- 99.0 - - -	25.0- - - -													- - - - - - -	
	98.0 - - - - - 97.0	26.0- - - - - 27.0-				Start of Coring at 25.9m. Continued on Rock Core Log sheet.										
200	- - 96.0 - -	28.0- - -													 - - - - -	
		29.0-													- - - - -	
No	tes:															



Baffinland Iron Mine

Client:

BOREHOLE LOG

ROCK CORE FORMAT

Project No.: H353004

Project: Mary River Expansion Study Datum: NAD83

Location: Proposed Bridge 70 Abutment Platform:

BH18-BR70-1

Sheet 4 of 5

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

	Œ				ō	<u></u>	Rock Description				Defect			Defect Description
water	Elevation (m)	Depth (m)	Method	Run #/TCR	Graphic Log	Geological Unit	ROCK TYPE; Grain size, texture and fabric, colour, general defect conditions, minor constituents.	Weathering/ Cementation	Estimated Strength 표물포질그렇네	Is ₍₅₀₎ [UCS] MPa	Spacing mm [000,000,000]	RQD %	Defect Log	Inclination, type, infill, amount, aperture, planarity roughness, frequency Specific Ge
	- - - - 103.0									- - -				
	- - - - 102.0	-								- - - -				
	- - - - 101.0	23.0 —								- - - -				
	- - - 100.0 -	24.0 —								- - - -				
	- - - 99.0 -	25.0 —								- - - -				
	- - - 98.0 - -	26.0 —		101			Resuming in Rock Core Format 25.9m. BEDROCK: Siltstone to dolomitic limestone, grey with dark grey / black streaks, fine to very fine grained,			- - - -				-90° Jt PI Sm -90° Jt PI Sm Silt, light brown cg DI -90° Jt PI Sm
	- 97.0 - -	27.0 —		18 / 101			medium strong rock. 25.98 m - 27.02 m: Silt seams. 27.32 m - 27.36 m: Silt seams.			- - -		- 64		190° Jt PI Sm Yellowish brown coati cg 90° Jt PI Sm Silt cg 90° Jt PI Sm Some silt cg 90° Jt PI Sm Sm Sm 190° Jt PI Sm
	- - - 96.0 -	28.0 —		19 / 72			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.			- - - -		42		-90° Jt Pi Sm -90° Jt Pi Sm Sm -90° Jt Pi Sm -90° Jt Pi Sm -90° Jt Pi Sm -90° Jt Pi Sm -90° Jt Pi Sm
	- - - 95.0 - -	29.0 —		20 / 86			28.60 m - 29.50 m: No visible mud, but some core loss.			- - - -		83		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
	- - - 94.0	30.0 —					29.50 m - 31.00 m: Bioturbated, 5 cm mud seam, strong rock.			-		28		\\\\80° Jt PI Sm \\\\90° Jt PI Sm \\\\Fz \\\90° Jt Ir Ro
Note	es:						Planarity <u>Defect</u> PI Planar <u>Description</u> Ir Irregular <u>Legend</u> Cu Curved Un Undulose	Jt J	Orilling Induced oint Parting on Conta	Cz Cr	eam rushed Zone ractured Zone		Ro Sm Po	Rough cn Clean Smooth sn Stained Polished vn Veneer



Baffinland Iron Mine

Client:

HATCH LIBRARY DEVELOPMENT COPY, GLB Log CORED BOREHOLE GINT LOGS MR 2018 GEOTECHNICAL INVESTIGATION - V7. GPJ <<DrawngFile>> 29/08/2018 11:10

BOREHOLE LOG

ROCK CORE FORMAT

Project No.: H353004

Project: Mary River Expansion Study Datum: NAD83

Location: Proposed Bridge 70 Abutment Platform:

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

BH18-BR70-1

Sheet 5 of 5

529,138.0 m Easting:

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

	Cor	tracte	or: Bo	art I	ong	year	Rig Typ	be/ Mounting: Sonic Drill Rig Bearing: N/A°	D	ate Log	ged:	4/13/20	18	Lo	gge	d By: YF/MY	
Ĺ	Dril	ler:	Br	ent l	1AoN	ndrew	Hole Di	ameter (mm): 100 Plunge: °	D	ate Che	ecked	:		Re	viev	ved By:	
	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	Estima Stren	gth	Is ₍₅₀₎ [UCS] MPa	Defect Spacing mm [1001] 0007 0008 0008	Inclination, type, infill, amount, aperture, planar roughness, frequency		amount, aperture, planarity, roughness, frequency Specific Genera	ıl
	-	. 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)				-		28		190° Jt PI SM Silt cg 190° Jt PI SM 1 SM 1 SM 190° Jt Ir Ro 190° Jt PI SM 190° Jt PI SM 190° Jt PI SM Silt cg FZ 190° Jt PI RO DI	
0	-	— 92.0	32.0 —		22 / 103			To Townsh Dorth				- - - - -		95			
1gFIIe>> 29/00/20 10 11.1		91.0	33.0 —					To Target Depth. Drillhole BH18-BR70-1 terminated at 32.5m.				- - - - -					
וטוא - עד. שוטי - אוטו			34.0 —									- - - - -					
HINIOAL III VEGINA			35.0 —									- - - -					
JOSS MIN 2018 GEO LE		— 87.0	37.0 —									- - - -					
ED BOREHOLE GINI L		. 86.0	38.0 —									- - - -					
INI COPT.GLB LOG CORED	- - -	85.0 -	39.0 —									- - - - -					
3		– 84.0	40.0 —									_					
1A I CH LIBRARY DEVEL	Note		-					Defect Planarity Description Ir Irregular Legend Cu Curved Un Undulose St Stepped	Jt J Pt F Sh S	Orilling Ind oint Parting on Shear Sea Crushed S	Conta	Cz Cr	eam ushed Zone actured Zone eak Band		Ro Sm Po SI	Smooth sn Stained	

Project:

Contractor: Boart Longyear

BOREHOLE REPORT

BH18-BR70-2

Client: Baffinland Iron Mine

Mary River Expansion Study

Rig Type/ Mounting: Sonic Drill Rig

Location: Proposed Bridge 70 Abutment Project No.: H353004

Datum: NAD83

Platform:

Date Logged: 4/17/2018

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

rill	ler:	Br	ent N	/lcAn	drew	Hole Diameter (mm): 100	Date F	Rev	iew	ed:		+	Reviewed By:						
	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	0 	Moisture Content Profile	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Test	
Ŧ	-	-				SAND, trace to some SILT: Light brown, fine to medium grained.	Nbn												
ŀ						9													
ŀ	123.0	1.0-										1	38	47	15				
ŀ	.	-							И			20	0	86	14				
ŀ	.	-					Nbe												
ŀ	-122.0	2.0-									i i i l								
F		-									i i i l								
	.	-	1																
	—121.0 ·	3.0-	1									15	0	91	9				
ŀ	.	-										13	"	31	"				
ŀ	—120.0	4.0-																	
ŀ		-																	
F		-																	
-	119.0	5.0-																	
ŀ	.	-									iiil								
ŀ	.	-																	
ŀ	—118.0	6.0-				6.10 m: With fine black organic layers.													
ŀ	.	-				o. To III. With line black organic layers.													
F		-																	
ŀ	—117.0 ·	7.0-				7.00 m - 7.10 m: Silt, some sand.													
-	.	-	1		11111	SAND interbedded with SILT.	Nho												
-	 	8.0-				SAND IIILEIDEUGEG WILN SILT.	Nbe												
ŀ	.	-				8.30 m: Becoming finer with depth.	Vr												
-	.	-	-			5.55 III. Becoming litter with deptil.	VI				i i i l								
-	115.0	9.0-			HH	ICE: 40% soil	ICE												
F	.	-	1			SILT, some CLAY: Dark brown.	Vr - Vs												
-	.	-				9.70 m - 10.10 m: Ice lenses, snow like.						23	0	2	98				
ote	114.0	10.0						_											

BOREHOLE REPORT

BH18-BR70-2

Sheet 2 of 4

529,107.0 m

Client: Baffinland Iron Mine

Project No.: H353004

Project:

Mary River Expansion Study

NAD83

Location:

Proposed Bridge 70 Abutment

Datum:

Northing: 7,916,700.0 m Surface Elevation: 124.00 m

Easting:

Bottom Elevation: 95.50 m

rille	r:	Bre	ent N	1cAn	drew	Hole Diameter (mm): 100	Date Logged: 4/17/2018 Date Reviewed:							Re	YF/MY						
Vyatel Tiproties (m)	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		Sample Type	0		loistur tent P		50	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Othe Test
	01 11.0 12.0 11.0 10.0 09.0 08.0	11.0- -	Me	Ca			Vr - Vs (Continue Nbn Vr		Samp					500	Fig.	Per	Perc	Perc	Liqu	Plas	
	04.0	20.0			9	19.35 m - 19.60 m: Silt, grey, pieces of rock, likely bedrock, thin horizontal laminations, smooth, horizontal					 	 1	 1			0	2	98			

Contractor: Boart Longyear

BOREHOLE REPORT

BH18-BR70-2

Easting:

Northing:

Sheet 3 of 4

Client: Baffinland Iron Mine

Project No.: H353004

529,107.0 m

Project: Mary River Expansion Study

Datum: NAD83

7,916,700.0 m Surface Elevation: 124.00 m

Location: Proposed Bridge 70 Abutment Platform:

Bottom Elevation: 95.50 m

Date Logged: 4/17/2018

Total Depth: 28.5 m Logged By: YF/MY

Hole Diameter (mm): 100 Date Reviewed: Brent McAndrew Reviewed By:

Rig Type/ Mounting: Sonic Drill Rig

Driller: (E Field Water Conten Soil Description Elevation $\widehat{\mathbb{E}}$ Moisture Percent Sand Graphic L Other Method ype Liquid Limit Casing TYPE; plasticity or particle characteristics Content Profile Depth (Frozen Soil Tests Water (size, grading, shape, roundness), colour, structure, accessory components. Description Sample. 0 25 50 fractures, silt seams present. COBBLES: Limestone in possible rock floor. (Continued) 103.0 21.0 21.20 m - 22.10 m: Fractured zone. fresh, strong. Start of Coring at 21.3m. Continued on Rock Core Log sheet. 22.0 23.0 -101.0 24.0 25.0 26.0 27.0-28.0-29.0

HATCH LIBRARY DEVELOPMENT COPY.GLB Log ICE BOREHOLE GINT LOGS MR 2018 GEOTECHNICAL INVESTIGATION - V7.GPJ <<DrawngFile>> 29/08/2018 11:14

Notes:



BOREHOLE LOG

ROCK CORE FORMAT

BH18-BR70-2

Sheet 4 of 4

529,107.0 m

7,916,700.0 m

124.00 m

95.50 m

28.5 m

YF/MY

Client: Baffinland Iron Mine Project No.: H353004

Project: Mary River Expansion Study Datum: NAD83

Location: Proposed Bridge 70 Abutment Platform:

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

Total Depth:

Easting:

Northing:

Surface Elevation:

Bottom Elevation:

Dr	iller:	Br	ent N	ИсАr	ndrew	Hole Di	ameter (mm): 100 Plunge: °	D	ate Ch	necked	l:			Rev	view	ed By:
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	Stre	mated ength घ⊐ ร่ ⊔ี	Is ₍₅₀₎ [UCS] MPa	Def Spar m	cing m	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.				- - - -					
0	- - - 102.0 -	22.0 —					BEDROCK: Siltstone to dolomitic limestone. 22.10 m - 24.00 m: Fractured, crystal filled (white, medium grade) voids from				- - - -					
ngFile>> 29/08/2018 11:1	- 101.0 - -	23.0 —					23.30 m, fresh, strong.				- - - - -					
TION - V7.GPJ < <drawir< td=""><td>- - -</td><td>24.0 —</td><td></td><td></td><td></td><td></td><td>24.00 m - 25.50 m: Void to 24.40 m, becoming beige 24.50 m - 24.70 m, mottled.</td><td></td><td></td><td></td><td>- - - -</td><td></td><td></td><td></td><td></td><td></td></drawir<>	- - -	24.0 —					24.00 m - 25.50 m: Void to 24.40 m, becoming beige 24.50 m - 24.70 m, mottled.				- - - -					
HATCH LIBRARY DEVELOPMENT COPY GLB Log CORED BOREHOLE GINT LOGS MR 2018 GEOTECHNICAL INVESTIGATION - V7.GPJ <-DrawingFile>> 29/08/2018 11:10	- - -	26.0 —					25.50 m - 27.00 m: Beige mottled from 25.60 m - 26.00 m, decreasing in beige concentrate after, fresh.				- - - -					
EHOLE GINT LOGS MR 2018	- - -	27.0 —					27.00 m - 28.50 m: Beige mottled grey mudstone, becoming more banded, strong, fresh, one vein at 28.00 m.				- - - - -					
PY.GLB Log CORED BOR	- - - -	28.0 —			=		To Target Depth. Drillhole BH18-BR70-2 terminated at 28.5m.				- - - -					
RY DEVELOPMENT CO		30.0					<u>Planarity</u> <u>Defect</u> PI Planar	Type	Orilling Ir	nduced	Sm Se	eam			Roi Ro	ughness Infill Amount Rough cn Clean
HATCH LIBRAR							Description Ir Irregular Cu Curved Un Undulose St Stepped	Jt S Pt F Sh S	Joint	on Conta	Cz Cr	ushed actured	Zone		Sm Po SI	Rougn cn Clean Smooth sn Stained Polished vn Veneer Slickenside cg Coating





Appendix C Sample Photographs



Sample Photographs

Borehole Name: BH16-B001 Mary River 12 MTPA Mine Expansion

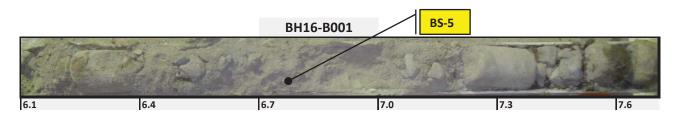
Location: 17 W 514191 7965675 Pre-feasibility Study
Completion Date: 3/12/2016 Baffinland Iron Mines

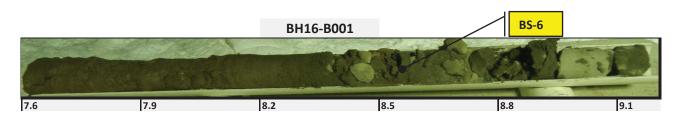


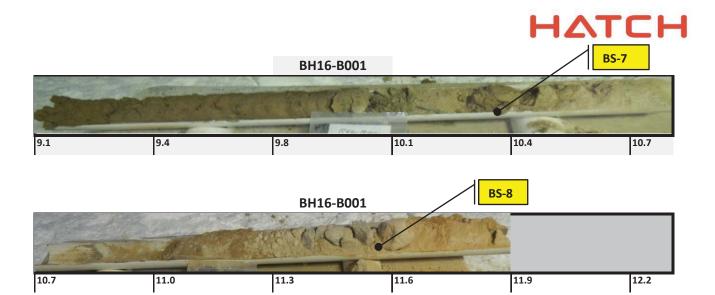










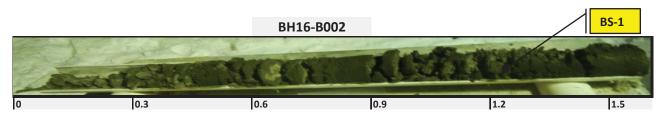




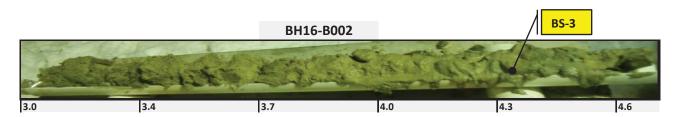
Sample Photographs

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







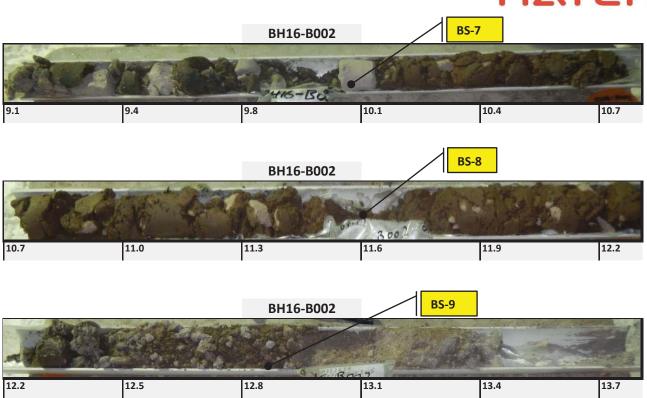








13.7



12.2

13.1

13.4



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

