

June 4, 2020

Assol Kubeisinova
Nunavut Water Board
P.O. Box 119
Gjoa Haven, Nunavut X0B 1J0

Chris Spencer
Qikiqtani Inuit Association
P.O. Box 1310
Iqaluit, NU X0A 0H0

RE: Quarry D1Q2 Closure Memo

Baffinland Iron Mines Corporation (Baffinland) submits the attached Deposit 1 Quarry 2 (D1Q2) Inspection and Review Summary for Closure for submission to the Nunavut Water Board (NWB) and the Qikitan Inuit Association (QIA). This memo was prepared in support of the re-purposing of the location of the D1Q2 Quarry for the construction of the KM106 Run of Mine (ROM) Stockpile and associated sedimentation pond, for which a construction notification was accepted by the NWB¹ on August 1, 2019.

Baffinland retained Knight Piesold Ltd. (KP) to complete the attached inspection and review of the D1Q2 quarry to support the closure of the active quarry and re-purposing of this location as the ROM Stockpile. While this quarry is not in a final closure and reclamation state due to the re-purposing of the location for new infrastructure, Baffinland executed its due diligence to confirm the facility was in a state of physical and chemical stability to ensure the long term closure objectives of the Mary River Project could be achieved. It is recognized that specific closure criteria have not yet been fully established in the Interim Closure and Reclamation Plan (Baffinland, 2018), and that ultimate final closure and reclamation of this area will require a comprehensive assessment against the yet-to-be established criteria. However, as a due diligence measure, Baffinland is confident that the assessment completed is in line with achieving the ultimate closure objectives for the Mary River Project, and in line with the Closure and Reclamation Activities outlined in the approved Quarry Management Plan for D1Q2².

It is noted that the memo prepared by KP has identified some areas of physical instability that will need to be addressed. These areas will be remediated throughout the construction of the ROM Stockpile, with future assessments of the stability of the ROM stockpile included in the bi-annual geotechnical inspections. As stated above, physical stability of this location will additionally be assessed on final closure and reclamation of the Mary River Project.

Baffinland submits the attached memo, and the analytical data that was relied upon in the assessment, to both the NWB and QIA, and by way of this letter confirms that no further quarrying activities are to occur at the location of the former D1Q2 Quarry. At this time, Baffinland is not seeking any adjustment to

¹ NWB (2019). Licence No. 2AM-MRY1325; Notification for Construction by Baffinland Iron Mines Corporation of the KM 106 Revised Run-of-Mine Stockpile and Sedimentation Pond. Letter from the Nunavut Water Board dated August 1, 2019.

² Baffinland (2013). Quarry Management Plan, Deposit 1 Quarry 2 (D1Q2). H349000-4200-07-245-0002. Rev. 0. Dated October 23, 2013.

the reclamation security associated with the D1Q2 Quarry, however it is noted that the disturbed area allocation for the D1Q2 Quarry and the ROM Stockpile are overlapping and duplicative, and Baffinland may seek a reduction in the disturbed area allocation on completion of the ROM Stockpile and verification of the final footprint of the facility by survey or satellite imagery.

We trust that the information provided in this memo is acceptable and supports the closure and re-purposing of the D1Q2 Quarry. Should you have any questions regarding this submission please contact the undersigned.

Sincerely,

A handwritten signature in black ink, appearing to read "Chris Murray", with a large, stylized loop at the end.

Christopher Murray
Environmental & Regulatory Compliance Manager

cc: Tim Sewell, Megan Lord-Hoyle, Lou Kamermans, Shawn Stevens, Connor Devereaux, Aaron MacDonell, Amanda McKenzie, Simon Fleury, Daniel Janusauskas, Lenny Tokar (Baffinland)

Attachments

Attachment 1 D1Q2 Inspection and Review Summary for Closure

Attachment 2 Supporting Analytical Data

Attachment 1

D1Q2 Inspection and Review Summary for Closure

MEMORANDUM

Date:	March 30, 2020	File No.:	NB102-00181/57-A.01
		Cont. No.:	NB19-00494
To:	Mr. Allan Knowlton		
Copy To:	Roger Doyle, Trevor Brisco, Simon Fleury		
From:	Amy Adams		
Re:	Deposit 1 Quarry 2 (D1Q2) Inspection and Review Summary for Closure		

1.0 INTRODUCTION

Baffinland Iron Mines Corporation (Baffinland) owns and operates the Mary River Project located on northern Baffin Island, Nunavut. Knight Piésold Ltd. (KP) completed the design for the KM106 Stockpile and associated water management measures (KP, 2019). The KM106 stockpile partially overlaps the existing Quarry 2 at Deposit 1 (D1Q2). As such, the D1Q2 quarry will need be closed prior to construction of the KM106 stockpile. KP completed an inspection and review of the D1Q2 quarry to support the closure work. This memo summarizes the inspection findings and provides recommendations to support closure of the D1Q2 quarry.

2.0 QUARRY CLOSURE REQUIREMENTS

The Quarry Management Plan for the D1Q2 Quarry (Hatch, 2013) requires that all materials, equipment, and infrastructure are removed and that reclamation activities are completed to meet the closure objectives defined by the site closure plan (Baffinland, 2018). The specific activities required for closure of the quarry are described as follows:

- **Waste Removal** - All waste including metallic waste, construction material waste, and domestic waste should be collected and placed in appropriate containers.
- **Stockpile Removal** - Any stockpiles of aggregate will be removed. Rock will be spread on the landscape and used to recontour the affected area, assist in drainage restoration, and re-establish vegetation.
- **Road Reclamation** - The D1Q2 access road will be graded to a stable state and scarified to allow for natural vegetation.
- **Soil Remediation** - Contaminated soils, snow, or ice packs will be identified and removed. The contaminated materials will be relocated to a site land farm.

In addition to the above, the closure configuration for the quarry must be physically, chemically, and thermally stable.

3.0 QUARRY INSPECTION AND REVIEW

3.1 GENERAL

An inspection of the D1Q2 Quarry was completed by Jessica Galavan, P.Eng., of KP on May 15 and 16, 2019. Figure 1 shows an aerial photo of the quarry provided by Baffinland.



Figure 1 Aerial Photo of the D1Q2 Quarry looking North

The quarry was divided into two areas for inspection purposes:

- Upper Quarry Area (Northwest of the haul road)
- Lower Quarry Area (Southeast of the haul road)

Similar geological and geotechnical conditions were encountered in both quarry areas. The bedrock is fresh to slightly weathered gneiss. Overburden is nonexistent or limited to a thickness of a few centimetres.

Both areas were generally clear of equipment and debris. A few miscellaneous items were present in the lower quarry area including a rubber mat, a few lengths of pipe, and a steel box.

3.2 PHYSICAL STABILITY

An assessment of the physical stability of the quarry was completed to support closure of the facility. Photos are included in Appendix A. The following conditions were observed in the Upper Quarry Area:

- The quarry has been excavated into a slope, resulting in one main wall oriented approximately NE-SW with a maximum height of approximately 10 m.
- The rock mass is blocky (Photo 1), with blocks formed by three main discontinuity orientations:
 - Foliation striking NW and dipping to the NE at approximately 70°
 - A joint set striking NE and dipping to the SE at approximately 80°
 - A joint set striking SE and dipping to the SW at approximately 45°

- The size of the blocks varies between approximately 0.3 and 2.0 m. The block size reduces towards the eastern end of the excavation. Several clay and rubble filled zones up to 10 cm thick were observed in this area (Photo 2).
- Numerous loose blocks were observed, particularly along the crest and toe of the wall (Photo 3) and partially overhanging the face of the wall (Photo 2).
- Numerous seeps and wet areas were observed on the face of the wall. More frequent seeps and increased flows were observed at the east end of the quarry, estimated to be in the order of a few litres per minute (Photo 4). The main drainage runs parallel to the haul road through the quarry.

The following conditions were observed in the Lower Quarry Area:

- The excavation consists of two main walls; one oriented N-S and the other E-W. The walls have a maximum height of approximately 5 m.
- Similar to the Upper Quarry Area, the rock mass is blocky with three dominant discontinuity orientations (Photo 5). The only difference observed was that the dip of the joint set striking SE and dipping to the SW varied between approximately 35 and 50°.
- The size of the blocks varies between approximately 0.2 and 1.5 m (Photos 6 and 7).
- Loose blocks were observed along the crest of the N-S oriented wall, which is located immediately below the haul road (Photo 8).
- No significant seeps were observed and the quarry walls appeared dry.

The physical stability of the quarry walls is expected to be controlled by the potential for rockfall and kinematic block failures of the rock mass structure. The potential for planar or block toppling kinematic failure was observed during the inspection, particularly in the northwestern walls of both areas of the quarry. Loose material is present along the crests of most of the quarry walls, which poses a rock fall hazard. Seasonal freezing and thawing, particularly in areas with seepage, may cause the rock mass to degrade over time, resulting in additional loose blocks.

The quarry should be closed according to Baffinland's Interim Closure and Reclamation Plan (Baffinland, 2018). It is recommended that the quarry walls be buttressed with coarse, free draining Non-Potentially Acid Generating (Non-PAG), Non-Metal Leaching (Non-ML) and clean fill materials to ensure physical stability of the slopes at closure. The backfill should be placed at 1.5H:1V slopes and be graded to provide adequate drainage of surface water and be contoured to conform to the final grading plan.

If the appropriate backfill material is not currently available, access to the area should be controlled until the buttress is completed. If work in close proximity to the walls is required prior to the completion of the buttress, an inspection of the slopes should be completed by qualified technical personnel before work commences and at regular intervals while work is progressing. In this scenario, it is expected that loose material will need to be scaled from the face prior to the commencement of work.

3.3 CHEMICAL STABILITY

An assessment of the chemical stability of the quarry was completed to support closure of the quarry. Initial geochemical characterization assessments were completed on samples that were collected in proximity to the D1Q2 Quarry. Additional sampling was completed during blasting of the quarry, as was outlined in the

Quarry Management Plan (Hatch, 2013). Some metals content testing was completed on the material in proximity to D1Q2 Quarry, but not on the Quarry material itself.

The following observations of the geochemical characterization of the quarry material were made:

- D1Q2 Quarry samples were tested for acid generating potential using Modified Acid Base Accounting (ABA) (MEND, 2009) and Whole Rock Analysis (WRA). The results are summarized as follows:
 - As indicated earlier, all samples have little to no sulphide sulphur. Sulphide sulphur is needed to generate acidic conditions.
 - All samples had a Neutralizing Potential / Acid Potential (NP/AP) of greater than 2.0. This indicates there is sufficient buffering capacity in the rock sample to reduce the potential for acid generation.
 - All samples, based on the above results, are considered to be Non-Potentially Acid Generating (Non-PAG).
- Toxicity Characterization Leaching Procedure (TCLP) testing following United States Environmental Protection Agency (USEPA) method 1311 (USEPA, 1992) was completed on 8 samples from the D1Q2 Quarry. The results are summarized as follows:
 - Results were screened against Table 10 of the Mary River Water Licence - Effluent Quality Discharge Limits for Open Pit, Stockpiles, and Sedimentation Ponds (NWB, 2015). It should be noted that only 2 parameters in the water licence were tested with the TCLP.
 - For comparative purposes only, the Canadian Council of Ministers of the Environment (CCME, 2014) Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) was also used as a screening tool to evaluate additional parameter concentrations.
 - There were no exceedances of the CCME guidelines, however there was a single exceedance of the Mary River Water Licence discharge limits for Total Lead from sample Q7 of 0.314 mg/L. It should be noted that the maximum allowable lead concentration in a grab sample based on Metal and Diamond Mining Effluent Regulations (MDMER) (Government of Canada, 2019) is 0.4 mg/L, which is double the 0.2 mg/L allowance of the water licence.

The material from D1Q2 Quarry is considered Non-PAG and will not require any modifications during closure. It should be noted that a TCLP test is typically used to assess the hazard potential for landfill wastes rather than quarry rock. The typical, less aggressive leach test for quarry rock is a Shake Flask Extraction (SFE) test (MEND, 2009). As such, given the aggressive nature of the TCLP and the lead exceedance concentration compared to MDMER, metal leaching (ML) is not likely to be of concern from the quarry material during closure.

3.4 THERMAL STABILITY

The quarry is constructed in bedrock. Thermal degradation or changes to the permafrost, if any, are not expected to impact the geotechnical stability or the landscape.

4.0 CLOSING

We trust that the information contained herein meets your needs at this time. Should additional information be required please do not hesitate to contact the undersigned.

Yours truly,
Knight Piésold Ltd.

Prepared:


Amy L. Adams, Ph.D., P.Eng., P.E.
Senior Engineer



Reviewed


Ben Peacock, P.Eng.
Senior Engineer

Prepared:


Amber Blackwell, P. Geo.
Project Geoscientist



Reviewed:

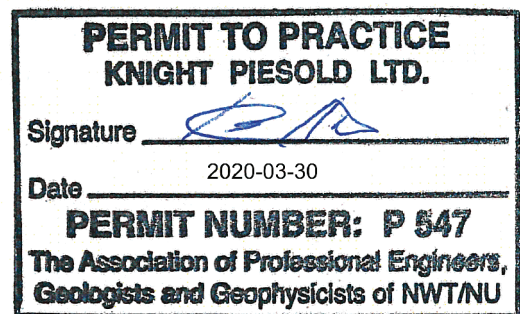

Steven R. Aiken, P.Eng.
Manager, Environmental Services

Approval that this document adheres to the Knight Piésold Quality System:



Attachments:

Appendix A Photographs



References:

- Baffinland Iron Mines Corporation (Baffinland), 2018. *Interim Closure and Reclamation Plan*. October 30. Ref No. BAF-PH1-830-P16-0012, Rev. 5.
- Canadian Council of Ministers of the Environment (CCME), 2014. *Canadian Water Quality Guidelines for the Protection of Aquatic Life*. Retrieved from: <http://sts.ccme.ca/en/index.html?chems=all&chapters=all> (accessed January 31, 2020).
- Government of Canada, 2019. *Metal and Diamond Effluent Regulations*. June 25. SOR/2002-222.
- Hatch, 2013. *Quarry Management Plan, Deposit 1 Quarry 2 (D1Q2)*. October 23. Ref. No. H349000-4200-07-245-0002, Rev. 0.
- Knight Piésold Ltd. (KP), 2019. Letter to: Mr. Allan Knowlton, Baffinland Iron Mines Corporation. Re: *Design Summary for the KM106 Stockpile and Runoff Management Measures*. June 20. North Bay, ON. Ref. No. NB19-00443 (NB102-181/57).
- Nunavut Water Board (NWB), 2015. *Mary River Project - Water Licence 2AM-MRY1325 - Amendment No. 1*. July 30.
- US Environmental Protection Agency (USEPA), 1992. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods - Method 1311: Toxicity Characteristic Leaching Procedure*. July. Washington, DC. Document no. SW-846.
- MEND, 2009. *Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials*. December. Report 1.20.1.

/ab

APPENDIX A

Photographs

(Pages A-1 to A-4)

DEPOSIT 1 QUARRY 2 (D1Q2) INSPECTION AND REVIEW SUMMARY FOR CLOSURE



PHOTO 1 – Upper Quarry Area - Three main structural sets



PHOTO 2 – Upper Quarry Area - Reduced block size with clay infill at east end of wall

DEPOSIT 1 QUARRY 2 (D1Q2) INSPECTION AND REVIEW SUMMARY FOR CLOSURE



PHOTO 3 – Upper Quarry Area - Loose blocks at crest and accumulated at toe



PHOTO 4 – Upper Quarry Area - Seep at eastern end of wall

DEPOSIT 1 QUARRY 2 (D1Q2) INSPECTION AND REVIEW SUMMARY FOR CLOSURE



PHOTO 5 – Lower Quarry Area - Three main structural sets in north wall



PHOTO 6 – Block Size 1 of 2

DEPOSIT 1 QUARRY 2 (D1Q2) INSPECTION AND REVIEW SUMMARY FOR CLOSURE



PHOTO 7 – Block Size 2 of 2



PHOTO 8 – Lower Quarry Area - Loose blocks at crest of wall

Attachment 2

Supporting Analytical Data



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To: **BAFFINLAND IRON MINES CORPORATION**
2275 UPPER MIDDLE ROAD EAST
SUITE 300
OAKVILLE ON L6H 0C3

Page: 1
Total # Pages: 2 (A)
Plus Appendix Pages
Finalized Date: 3 - OCT - 2016
Account: BIMCIO

CERTIFICATE BF16166704

Project: D1Q2

P.O. No.: 4500017424

This report is for 3 Drill Chip samples submitted to our lab in Baffinland, NU, Canada on 1-OCT-2016.

The following have access to data associated with this certificate:

TREVOR BRISCO
ALEXANDRA OZARUK
STEPHEN TILLEY
WARRICK WILLIAMS

ADAM GYORFFY
DALE PITTMAN
ANDY TOPILOK

JOSH MANNING
HAYLEY POTHIER
MATTHEW TRACEY

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-22	Sample login - Rcd w/o BarCode
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um
DRY-21	High Temperature Drying

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
S-IR08	Total Sulphur (Leco)	LECO
C-IR07	Total Carbon (Leco)	LECO

To: **BAFFINLAND IRON MINES CORPORATION**
ATTN: ANDY TOPILOK
2275 UPPER MIDDLE ROAD EAST
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This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:

Colin Ramshaw, Vancouver Laboratory Manager



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Finalized Date: 3 - OCT - 2016
Account: BIMCIO

Project: D1Q2

CERTIFICATE OF ANALYSIS BF16166704

Sample Description	Method Analyte Units LOR	WEI-21	C-IR07	S-IR08
		Recvd Wt.	C	S
		kg	%	%
		0.02	0.01	0.01
D1Q21280005-1316-R803098		4.91	0.03	<0.01
D1Q21280005-1214-R803099		4.05	0.05	0.01
D1Q21280005-1421-R803100		5.68	0.06	<0.01



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Page: Appendix 1
Total # Appendix Pages: 1
Finalized Date: 3 - OCT - 2016
Account: BIMCIO

Project: D1Q2

CERTIFICATE OF ANALYSIS BF16166704

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Applies to Method:	Processed at ALS Baffinland, Mary River, Baffin Island, Nunavut, Canada			
	C-IR07	CRU-31	DRY-21	LOG-22
	PUL-31	S-IR08	SPL-21	WEI-21



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CERTIFICATE BF16166773

Project: D1Q2

P.O. No.: 4500017424

This report is for 1 Drill Chip sample submitted to our lab in Baffinland, NU, Canada on 1-OCT-2016.

The following have access to data associated with this certificate:

TREVOR BRISCO
ALEXANDRA OZARUK
STEPHEN TILLEY
WARRICK WILLIAMS

ADAM GYORFFY
DALE PITTMAN
ANDY TOPILOK

JOSH MANNING
HAYLEY POTHIER
MATTHEW TRACEY

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-22	Sample login - Rcd w/o BarCode
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um
DRY-21	High Temperature Drying

ANALYTICAL PROCEDURES

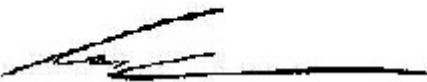
ALS CODE	DESCRIPTION	INSTRUMENT
S-IR08	Total Sulphur (Leco)	LECO
C-IR07	Total Carbon (Leco)	LECO

To: **BAFFINLAND IRON MINES CORPORATION**
ATTN: ANDY TOPILOK
2275 UPPER MIDDLE ROAD EAST
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Signature:


Colin Ramshaw, Vancouver Laboratory Manager



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Project: D1Q2

CERTIFICATE OF ANALYSIS BF16166773

Sample Description	Method Analyte Units LOR	WEI-21 Recvd Wt. kg 0.02	C-IR07 C % 0.01	S-IR08 S % 0.01
D1Q21280005-1118-R758900		5.81	0.10	<0.01



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Page: Appendix 1
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Finalized Date: 3 - OCT - 2016
Account: BIMCIO

Project: D1Q2

CERTIFICATE OF ANALYSIS BF16166773

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Applies to Method:

Processed at ALS Baffinland, Mary River, Baffin Island, Nunavut, Canada

C-IR07

CRU-31

DRY-21

LOG-22

PUL-31

S-IR08

SPL-21

WEI-21



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Total # Pages: 2 (A)
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Finalized Date: 10 - OCT - 2016
Account: BIMCIO

CERTIFICATE BF16171010

Project: D1Q2

P.O. No.: 4500017424

This report is for 4 Drill Chip samples submitted to our lab in Baffinland, NU, Canada on 7-OCT-2016.

The following have access to data associated with this certificate:

TREVOR BRISCO
ALEXANDRA OZARUK
STEPHEN TILLEY
WARRICK WILLIAMS

ADAM GYORFFY
DALE PITTMAN
ANDY TOPIIAK

JOSH MANNING
HAYLEY POTHIER
MATTHEW TRACEY

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
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DRY-21	High Temperature Drying

ANALYTICAL PROCEDURES

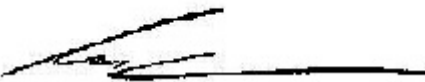
ALS CODE	DESCRIPTION	INSTRUMENT
S-IR08	Total Sulphur (Leco)	LECO
C-IR07	Total Carbon (Leco)	LECO

To: **BAFFINLAND IRON MINES CORPORATION**
ATTN: MATTHEW TRACEY
2275 UPPER MIDDLE ROAD EAST
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This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:


Colin Ramshaw, Vancouver Laboratory Manager



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Page: 2 - A
 Total # Pages: 2 (A)
 Plus Appendix Pages
 Finalized Date: 10 - OCT - 2016
 Account: BIMCIO

Project: D1Q2

CERTIFICATE OF ANALYSIS BF16171010

Sample Description	Method Analyte Units LOR	WEI-21 Recvd Wt. kg 0.02	C-IR07 C % 0.01	S-IR08 S % 0.01
D1Q2-1416-R758213		3.72	<0.01	<0.01
D1Q2-1819-R758214		2.48	0.65	<0.01
D1Q2-1819-R758215		2.14	0.35	<0.01
D1Q3-1521-R758221		3.20	0.03	<0.01



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Page: Appendix 1
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Finalized Date: 10-OCT-2016
Account: BIMCIO

Project: D1Q2

CERTIFICATE OF ANALYSIS BF16171010

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Applies to Method:	Processed at ALS Baffinland, Mary River, Baffin Island, Nunavut, Canada			
	C-IR07	CRU-31	DRY-21	LOG-22
	PUL-31	S-IR08	SPL-21	WEI-21



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Total # Pages: 2 (A)
Plus Appendix Pages
Finalized Date: 29-JUL-2016
Account: BIMCIO

CERTIFICATE BF16120952

Project: D1Q2

P.O. No.: 4500017424

This report is for 5 Rock samples submitted to our lab in Baffinland, NU, Canada on 26-JUL-2016.

The following have access to data associated with this certificate:

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TERRY MILTON
HAYLEY POTHIER
MATTHEW TRACEY

ADAM GYORFFY
ALEXANDRA OZARUK
STEPHEN TILLEY
WARRICK WILLIAMS

JOSH MANNING
DALE PITTMAN
ANDY TOPILAK

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-22	Sample login - Rcd w/o BarCode
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um
DRY-21	High Temperature Drying

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
S-IR08	Total Sulphur (Leco)	LECO
C-IR07	Total Carbon (Leco)	LECO

To: **BAFFINLAND IRON MINES CORPORATION**
ATTN: ALEXANDRA OZARUK
2275 UPPER MIDDLE ROAD EAST
SUITE 300
OAKVILLE ON L6H 0C3

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:

Colin Ramshaw, Vancouver Laboratory Manager



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Project: D1Q2

Finalized Date: 29-JUL-2016
Account: BIMCIO

CERTIFICATE OF ANALYSIS BF16120952

Sample Description	Method Analyte Units LOR	WEI-21	C-IR07	S-IR08
		Recvd Wt.	C	S
		kg	%	%
		0.02	0.01	0.01
D1Q2-1505-R758004		2.89	0.28	0.04
D1Q2-1707-R758005		2.07	0.28	0.03
D1Q2-1303-R758006		1.65	0.02	0.05
D1Q2-1106-R758007		2.41	0.04	0.02
D1Q2-1002-R758008		2.26	0.27	0.01

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To: BAFFINLAND IRON MINES CORPORATION
2275 UPPER MIDDLE ROAD EAST
SUITE 300
OAKVILLE ON L6H 0C3

Page: Appendix 1
Total # Appendix Pages: 1
Finalized Date: 29-JUL-2016
Account: BIMCIO

Project: D1Q2

CERTIFICATE OF ANALYSIS BF16120952

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Applies to Method:	Processed at ALS Baffinland, Mary River, Baffin Island, Nunavut, Canada			
	C-IR07	CRU-31	DRY-21	LOG-22
	PUL-31	S-IR08	SPL-21	WEI-21



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Page: 1
Total # Pages: 2 (A)
Plus Appendix Pages
Finalized Date: 20-SEP-2016
Account: BIMCIO

CERTIFICATE BF16157207

Project: D1Q2

P.O. No.: 4500017424

This report is for 7 Drill Chip samples submitted to our lab in Baffinland, NU, Canada on 18-SEP-2016.

The following have access to data associated with this certificate:

TREVOR BRISCO
ALEXANDRA OZARUK
STEPHEN TILLEY
WARRICK WILLIAMS

ADAM GYORFFY
DALE PITTMAN
ANDY TOPIIAK

JOSH MANNING
HAYLEY POTHIER
MATTHEW TRACEY

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-22	Sample login - Rcd w/o BarCode
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um
DRY-21	High Temperature Drying

ANALYTICAL PROCEDURES

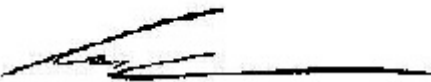
ALS CODE	DESCRIPTION	INSTRUMENT
S-IR08	Total Sulphur (Leco)	LECO
C-IR07	Total Carbon (Leco)	LECO

To: **BAFFINLAND IRON MINES CORPORATION**
ATTN: TREVOR BRISCO
2275 UPPER MIDDLE ROAD EAST
SUITE 300
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Signature:


Colin Ramshaw, Vancouver Laboratory Manager



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Page: 2 - A
 Total # Pages: 2 (A)
 Plus Appendix Pages
 Finalized Date: 20-SEP-2016
 Account: BIMCIO

Project: D1Q2

CERTIFICATE OF ANALYSIS BF16157207

Sample Description	Method Analyte Units LOR	WEI-21 Recvd Wt. kg 0.02	C-IR07 C % 0.01	S-IR08 S % 0.01
D1Q21280003-2204-R758787		3.26	0.05	0.03
D1Q21280003-1703-R758788		1.94	0.03	0.02
D1Q21280003-1706-R758789		2.13	0.19	0.03
D1Q21280003-2107-R758790		2.45	0.04	0.04
D1Q21280003-1811-R758791		0.89	0.47	0.02
D1Q21280003-1811D-R758791		0.80	0.29	0.02
D1Q21280003-1908-R758793		3.48	0.03	0.02



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Page: Appendix 1
Total # Appendix Pages: 1
Finalized Date: 20-SEP-2016
Account: BIMCIO

Project: D1Q2

CERTIFICATE OF ANALYSIS BF16157207

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Applies to Method:	Processed at ALS Baffinland, Mary River, Baffin Island, Nunavut, Canada			
	C-IR07	CRU-31	DRY-21	LOG-22
	PUL-31	S-IR08	SPL-21	WEI-21



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Page: 1
Total # Pages: 2 (A)
Plus Appendix Pages
Finalized Date: 20 - OCT - 2014
Account: BIMCIO

CERTIFICATE BF14143344

Project: D1Q21308003

P.O. No.: 4500003876

This report is for 15 Drill Chip samples submitted to our lab in Baffinland, NU,
Canada on 18-OCT-2014.

The following have access to data associated with this certificate:

BAFFINLAND A/P
MAURICE DESPRES
COURTNEY OPPER

SARAH CANNING
ADAM GYORFFY
ALEXANDRA OZARUK

FRANCISCO CONSUEGRA
JOSH MANNING

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
CRU-QC	Crushing QC Test
PUL-QC	Pulverizing QC Test
LOG-22	Sample login - Rcd w/o BarCode
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um
DRY-21	High Temperature Drying

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
S-IR08	Total Sulphur (Leco)	LECO
C-IR07	Total Carbon (Leco)	LECO

To: **BAFFINLAND IRON MINES CORPORATION**
ATTN: COURTNEY OPPER
2275 UPPER MIDDLE ROAD EAST
SUITE 300
OAKVILLE ON L6H 0C3

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Signature:

Colin Ramshaw, Vancouver Laboratory Manager



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Page: 2 - A
Total # Pages: 2 (A)
Plus Appendix Pages
Finalized Date: 20-OCT-2014
Account: BIMCIO

Project: D1Q21308003

CERTIFICATE OF ANALYSIS BF14143344

Sample Description	Method	WEI-21	C-IR07	S-IR08
	Analyte	Recvd Wt.	C	S
	Units	kg	%	%
	LOR	0.02	0.01	0.01
D1Q21308003--R082501		1.95	0.03	<0.01
D1Q21308003-47B-R082502		4.15	0.05	0.03
D1Q21308003-258-R082503		3.63	0.08	0.02
D1Q21308003-185-R082504		3.71	0.05	0.08
D1Q21308003-189-R082505		4.65	0.04	0.08
D1Q21308003-354-R082506		5.04	0.19	0.02
D1Q21308003-445-R082507		5.05	0.09	0.06
D1Q21308003-504-R082508		3.76	0.03	<0.01
D1Q21308003-317-R082509		2.86	0.78	0.02
D1Q21308003-317D-R082510		3.22	0.07	0.05
D1Q21308003-233-R082511		5.98	0.13	0.04
D1Q21308003-43B-R082512		3.29	0.04	0.02
D1Q21308003-502-R082513		4.68	0.05	0.03
D1Q21308003-224-R082514		4.57	0.05	0.04
D1Q21308003-308-R082515		4.46	0.24	0.04

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Total # Appendix Pages: 1
Finalized Date: 20 - OCT - 2014
Account: BIMCIO

Project: D1Q21308003

CERTIFICATE OF ANALYSIS BF14143344

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Applies to Method:	Processed at ALS Baffinland, Mary River, Baffin Island, Nunavit, Canada		
	C-IR07	CRU-31	CRU-QC
	LOG-22	PUL-31	PUL-QC
	SPL-21	WEI-21	
		DRY-21	
		S-IR08	



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Finalized Date: 23-JUN-2015
Account: BIMCIO

CERTIFICATE BF15090562

Project: D1Q21308004

P.O. No.: 4500003876

This report is for 1 Rock sample submitted to our lab in Baffinland, NU, Canada on 22-JUN-2015.

The following have access to data associated with this certificate:

SARAH CANNING
COURTNEY OPPER
STEPHEN TILLEY
BEN WIDDOWSON

ADAM GYORFFY
ALEXANDRA OZARUK
ANDY TOPIKAK
WARRICK WILLIAMS

JOSH MANNING
DALE PITTMAN
MATTHEW TRACEY

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
CRU-QC	Crushing QC Test
PUL-QC	Pulverizing QC Test
LOG-22	Sample login - Rcd w/o BarCode
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um
DRY-21	High Temperature Drying

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
S-IR08	Total Sulphur (Leco)	LECO
C-IR07	Total Carbon (Leco)	LECO

To: **BAFFINLAND IRON MINES CORPORATION**
ATTN: MATTHEW TRACEY
2275 UPPER MIDDLE ROAD EAST
SUITE 300
OAKVILLE ON L6H 0C3

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***** See Appendix Page for comments regarding this certificate *****

Signature:

Colin Ramshaw, Vancouver Laboratory Manager



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Page: 2 - A
Total # Pages: 2 (A)
Plus Appendix Pages
Finalized Date: 23-JUN-2015
Account: BIMCIO

Project: D1Q21308004

CERTIFICATE OF ANALYSIS BF15090562

Sample Description	Method Analyte Units LOR	WEI-21	C-IR07	S-IR08
		Recvd Wt.	C	S
		kg	%	%
D1Q21308004-4310-R767911		0.02	0.01	0.01
		2.67	0.13	0.17



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Page: Appendix 1
Total # Appendix Pages: 1
Finalized Date: 23-JUN-2015
Account: BIMCIO

Project: D1Q21308004

CERTIFICATE OF ANALYSIS BF15090562

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Applies to Method:	Processed at ALS Baffinland, Mary River, Baffin Island, Nunavut, Canada			
	C-IR07	CRU-31	CRU-QC	DRY-21
	LOG-22	PUL-31	PUL-QC	S-IR08
	SPL-21	WEI-21		



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Page: 1
Total # Pages: 2 (A)
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Finalized Date: 25-JUN-2015
Account: BIMCIO

CERTIFICATE BF15091441

Project: D1Q21308004_Assay

P.O. No.: 4500003876

This report is for 3 Pulp samples submitted to our lab in Baffinland, NU, Canada on 23-JUN-2015.

The following have access to data associated with this certificate:

SARAH CANNING
COURTNEY OPPER
STEPHEN TILLEY
BEN WIDDOWSON

ADAM GYORFFY
ALEXANDRA OZARUK
ANDY TOPIIAK
WARRICK WILLIAMS

JOSH MANNING
DALE PITTMAN
MATTHEW TRACEY

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
MAG-SUS	Magnetic Susceptibility	WST-SEQ
FeO-CALC21	FeO from MAG-SUS	
ME-XRF21bf	BF - Iron Ore by XRF Fusion	XRF
ME-GRA05	H2O/LOI by TGA furnace	TGA

To: **BAFFINLAND IRON MINES CORPORATION**
ATTN: MATTHEW TRACEY
2275 UPPER MIDDLE ROAD EAST
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***** See Appendix Page for comments regarding this certificate *****

Comments: **ME-XRF21bf, ME-GRA05, MAG-SUS & FeO-CALC21 Results for Samples Originally Reported on Certificates BF15090562, BF15091148 & BF15091275.**

Signature:

Colin Ramshaw, Vancouver Laboratory Manager



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To: BAFFINLAND IRON MINES CORPORATION
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Page: 2 - A
 Total # Pages: 2 (A)
 Plus Appendix Pages
 Finalized Date: 25-JUN-2015
 Account: BIMCIO

Project: D1Q21308004_ Assay

CERTIFICATE OF ANALYSIS BF15091441

Sample Description	Method Analyte Units LOR	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-GRA05	MAG-SUS	FeO-CALC21
		Al2O3	CaO	Fe	Fe2O3	K2O	Mn	Na2O	P	SiO2	LOI	Magnetic	FeO
		%	%	%	%	%	%	%	%	%	%	%	%
		0.1	0.01	0.1	0.1	0.003	0.01	0.05	0.002	0.1	0.01	0.01	0.01
D1Q21308004-4310-R767911		13.5	1.08	5.1	7.3	4.52	0.15	0.26	0.066	65.4	2.17	2.00	0.62
D1Q21308004-3909-R767939		16.2	0.57	4.5	6.4	5.40	0.10	0.20	0.094	64.5	2.08	1.62	0.50
D1Q21308004-4505-R767953		13.8	0.99	4.3	6.2	5.17	0.10	0.30	0.066	66.8	1.60	1.71	0.53

Comments: **ME-XRF21bf, ME-GRA05, MAG-SUS & FeO-CALC21 Results for Samples Originally Reported on Certificates BF15090562, BF15091148 & BF15091275.**

***** See Appendix Page for comments regarding this certificate *****



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Page: Appendix 1
Total # Appendix Pages: 1
Finalized Date: 25-JUN-2015
Account: BIMCIO

Project: D1Q21308004_ Assay

CERTIFICATE OF ANALYSIS BF15091441

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Applies to Method:

Processed at ALS Baffinland, Mary River, Baffin Island, Nunavut, Canada
FeO-CALC21

MAG-SUS

ME-GRA05

ME-XRF21bf



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Total # Pages: 2 (A)
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Finalized Date: 29-JUN-2015
Account: BIMCIO

CERTIFICATE BF15094056

Project: D1Q21308004

P.O. No.: 4500003876

This report is for 4 Rock samples submitted to our lab in Baffinland, NU, Canada on 28-JUN-2015.

The following have access to data associated with this certificate:

SARAH CANNING
COURTNEY OPPER
STEPHEN TILLEY
BEN WIDDOWSON

ADAM GYORFFY
ALEXANDRA OZARUK
ANDY TOPIKAK
WARRICK WILLIAMS

JOSH MANNING
DALE PITTMAN
MATTHEW TRACEY

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
DRY-21	High Temperature Drying
LOG-22	Sample login - Rcd w/o BarCode
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
MAG-SUS	Magnetic Susceptibility	WST-SEQ
FeO-CALC21	FeO from MAG-SUS	
ME-XRF21bf	BF - Iron Ore by XRF Fusion	XRF
ME-GRA05	H2O/LOI by TGA furnace	TGA
S-IR08	Total Sulphur (Leco)	LECO
C-IR07	Total Carbon (Leco)	LECO

To: **BAFFINLAND IRON MINES CORPORATION**
ATTN: MATTHEW TRACEY
2275 UPPER MIDDLE ROAD EAST
SUITE 300
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Signature:

Colin Ramshaw, Vancouver Laboratory Manager



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 Account: BIMCIO

Project: D1Q21308004

CERTIFICATE OF ANALYSIS BF15094056

Sample Description	Method Analyte Units LOR	WEI-21	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-GRA05	MAG-SUS	FeO-CALC21	C-IR07	S-IR08
		Recvd Wt.	Al2O3	CaO	Fe	Fe2O3	K2O	Mn	Na2O	P	SiO2	LOI	Magnetic	FeO	C	S	
		kg	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
		0.02	0.1	0.01	0.1	0.1	0.003	0.01	0.05	0.002	0.1	0.01	0.01	0.01	0.01	0.01	
D1Q21308004-4210-R763790		4.59	10.3	1.00	4.3	6.2	3.25	0.10	0.41	0.047	67.8	2.01	2.10	0.65	0.15	0.09	
D1Q21308004-3910-R763791		5.14	12.6	0.41	4.5	6.4	4.44	0.11	0.14	0.072	70.6	1.66	1.91	0.59	0.11	<0.01	
D1Q21308004-3913-R763792		3.91	11.8	0.27	3.3	4.7	4.16	0.05	0.14	0.049	75.2	1.51	2.05	0.64	0.09	0.01	
D1Q21308004-3810-R763793		6.60	11.8	0.30	5.1	7.3	4.15	0.15	0.12	0.067	71.4	1.47	2.10	0.65	0.07	0.03	



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Total # Appendix Pages: 1
Finalized Date: 29-JUN-2015
Account: BIMCIO

Project: D1Q21308004

CERTIFICATE OF ANALYSIS BF15094056

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Applies to Method:

Processed at ALS Baffinland, Mary River, Baffin Island, Nunavut, Canada

C-IR07

CRU-31

DRY-21

FeO-CALC21

LOG-22

MAG-SUS

ME-GRA05

ME-XRF21bf

PUL-31

S-IR08

SPL-21

WEI-21



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2275 UPPER MIDDLE ROAD EAST
SUITE 300
OAKVILLE ON L6H 0C3

Page: 1
Total # Pages: 2 (A - B)
Plus Appendix Pages
Finalized Date: 15-MAY-2016
Account: BIMCIO

CERTIFICATE BF16075349

Project: D1Q2

P.O. No.: 4500017424

This report is for 5 Rock samples submitted to our lab in Baffinland, NU, Canada on 15-MAY-2016.

The following have access to data associated with this certificate:

TREVOR BRISCO
ALEXANDRA OZARUK
STEPHEN TILLEY
WARRICK WILLIAMS

ADAM GYORFFY
DALE PITTMAN
ANDY TOPIIAK

JOSH MANNING
HAYLEY POTHIER
MATTHEW TRACEY

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
DRY-21	High Temperature Drying
LOG-22	Sample login - Rcd w/o BarCode
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
MAG-SUS	Magnetic Susceptibility	WST-SEQ
FeO-CALC21	FeO from MAG-SUS	
ME-XRF21bf	BF - Iron Ore by XRF Fusion	XRF
ME-GRA05	H2O/LOI by TGA furnace	TGA
S-IR08	Total Sulphur (Leco)	LECO
C-IR07	Total Carbon (Leco)	LECO

To: **BAFFINLAND IRON MINES CORPORATION**
ATTN: MATTHEW TRACEY
2275 UPPER MIDDLE ROAD EAST
SUITE 300
OAKVILLE ON L6H 0C3

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:

Colin Ramshaw, Vancouver Laboratory Manager



ALS Canada Ltd.
 2103 Dollarton Hwy
 North Vancouver BC V7H 0A7
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To: BAFFINLAND IRON MINES CORPORATION
 2275 UPPER MIDDLE ROAD EAST
 SUITE 300
 OAKVILLE ON L6H 0C3

Page: 2 - A
 Total # Pages: 2 (A - B)
 Plus Appendix Pages
 Finalized Date: 15 - MAY - 2016
 Account: BIMCIO

Project: D1Q2

CERTIFICATE OF ANALYSIS BF16075349

Sample Description	Method Analyte Units LOR	WEI-21	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	ME-XRF21bf	MAG-SUS	FeO-CALC21	C-IR07
		Recvd Wt.	Al2O3	CaO	Fe	Fe2O3	K2O	Mn	Na2O	P	S	SiO2	LOI	Magnetic	FeO	C
		kg	%	%	%	%	%	%	%	%	%	%	%	%	%	%
		0.02	0.1	0.01	0.1	0.1	0.003	0.01	0.05	0.002	0.003	0.1	0.01	0.01	0.01	0.01
D1Q2-1908-R766216		1.36	12.1	0.14	3.6	5.1	4.26	0.05	0.13	0.045	0.016	74.9	1.45	1.35	0.42	0.01
D1Q2-2406-R766217		1.01	13.1	0.18	4.3	6.1	3.77	0.04	0.15	0.052	0.051	72.8	1.52	1.35	0.42	0.06
D1Q2-1803-R766218		1.27	12.1	0.12	3.0	4.3	4.19	0.05	0.13	0.041	0.006	75.1	1.46	1.44	0.45	0.01
D1Q2-1206-R766219		1.35	11.9	0.14	3.9	5.6	4.30	0.04	0.14	0.049	0.039	73.5	1.35	1.25	0.39	<0.01
D1Q2-1206D-R766220		1.41	12.2	0.13	4.0	5.7	4.42	0.04	0.13	0.050	0.035	73.2	1.38	1.35	0.42	<0.01



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Project: D1Q2

Total # Pages: 2 (A - B)

Plus Appendix Pages

Account: BIMCIO

CERTIFICATE OF ANALYSIS BF16075349

Sample Description

Method
Analyte
Units
LOR

S-IR08
S
%
0.01

D1Q2-1908-R766216
D1Q2-2406-R766217
D1Q2-1803-R766218
D1Q2-1206-R766219
D1Q2-1206D-R766220

<0.01
0.02
<0.01
0.01
0.01

***** See Appendix Page for comments regarding this certificate *****



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To: BAFFINLAND IRON MINES CORPORATION
2275 UPPER MIDDLE ROAD EAST
SUITE 300
OAKVILLE ON L6H 0C3

Page: Appendix 1
Total # Appendix Pages: 1
Finalized Date: 15 - MAY - 2016
Account: BIMCIO

Project: D1Q2

CERTIFICATE OF ANALYSIS BF16075349

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Applies to Method:

Processed at ALS Baffinland, Mary River, Baffin Island, Nunavut, Canada

C-IR07

CRU-31

DRY-21

FeO-CALC21

LOG-22

MAG-SUS

ME-GRA05

ME-XRF21bf

PUL-31

S-IR08

SPL-21

WEI-21



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Page: 1
Total # Pages: 2 (A)
Plus Appendix Pages
Finalized Date: 12 - OCT - 2016
Account: BIMCIO

CERTIFICATE BF16172216

Project: D1Q2

P.O. No.: 4500017424

This report is for 4 Drill Chip samples submitted to our lab in Baffinland, NU, Canada on 10-OCT-2016.

The following have access to data associated with this certificate:

TREVOR BRISCO
ALEXANDRA OZARUK
STEPHEN TILLEY
WARRICK WILLIAMS

ADAM GYORFFY
DALE PITTMAN
ANDY TOPIIAK

JOSH MANNING
HAYLEY POTHIER
MATTHEW TRACEY

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-22	Sample login - Rcd w/o BarCode
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um
DRY-21	High Temperature Drying

ANALYTICAL PROCEDURES

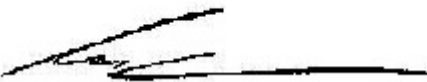
ALS CODE	DESCRIPTION	INSTRUMENT
S-IR08	Total Sulphur (Leco)	LECO
C-IR07	Total Carbon (Leco)	LECO

To: **BAFFINLAND IRON MINES CORPORATION**
ATTN: MATTHEW TRACEY
2275 UPPER MIDDLE ROAD EAST
SUITE 300
OAKVILLE ON L6H 0C3

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:


Colin Ramshaw, Vancouver Laboratory Manager



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Page: 2 - A
Total # Pages: 2 (A)
Plus Appendix Pages
Finalized Date: 12 - OCT - 2016
Account: BIMCIO

Project: D1Q2

CERTIFICATE OF ANALYSIS BF16172216

Sample Description	Method Analyte Units LOR	WEI-21 Recvd Wt. kg 0.02	C-IR07 C % 0.01	S-IR08 S % 0.01
D1Q2-2112-R758271		1.16	0.05	<0.01
D1Q2-1915-R758272		1.23	0.09	<0.01
D1Q2-1713-R758273		1.52	0.01	<0.01
D1Q3-1713-R758274		1.18	0.01	<0.01



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Page: Appendix 1
Total # Appendix Pages: 1
Finalized Date: 12 - OCT - 2016
Account: BIMCIO

Project: D1Q2

CERTIFICATE OF ANALYSIS BF16172216

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Applies to Method:	Processed at ALS Baffinland, Mary River, Baffin Island, Nunavut, Canada			
	C-IR07	CRU-31	DRY-21	LOG-22
	PUL-31	S-IR08	SPL-21	WEI-21



Baffinland Iron Mine's Corporation
(Oakville)
ATTN: Matthew Tracey
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 06-JUL-19
Report Date: 11-JUL-19 14:03 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2305146
Project P.O. #: 4500060218
Job Reference: 106KM QUARRY CLOSURE 20190703
C of C Numbers:
Legal Site Desc:

Rick Hawthorne
Account Manager

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* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305146-3 Q3 Sampled By: JM/MT on 03-JUL-19 @ 12:38 Matrix: SOLID TCLP Metals Lead (Pb) Mercury (Hg) Selenium (Se) Silver (Ag) Uranium (U)	<0.050 <0.00010 <0.025 <0.0050 <0.25		0.050 0.00010 0.025 0.0050 0.25	mg/L mg/L mg/L mg/L mg/L		10-JUL-19 11-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19	R4706228 R4707777 R4706228 R4706228 R4706228
L2305146-4 Q4 Sampled By: JM/MT on 03-JUL-19 @ 12:45 Matrix: SOLID Sample Preparation Initial pH Final pH TCLP Metals Arsenic (As) Barium (Ba) Boron (B) Cadmium (Cd) Chromium (Cr) Lead (Pb) Mercury (Hg) Selenium (Se) Silver (Ag) Uranium (U)	8.01 5.07 <0.050 <0.50 <2.5 <0.0050 <0.050 <0.050 <0.00010 <0.025 <0.0050 <0.25		0.10 0.10 0.050 0.50 2.5 0.0050 0.050 0.050 0.00010 0.025 0.0050 0.25	pH units pH units mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L		10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19 11-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19	R4707981 R4707981 R4706228 R4706228 R4706228 R4706228 R4706228 R4707777 R4706228 R4706228 R4706228
L2305146-5 Q5 Sampled By: JM/MT on 03-JUL-19 @ 12:59 Matrix: SOLID Sample Preparation Initial pH Final pH TCLP Metals Arsenic (As) Barium (Ba) Boron (B) Cadmium (Cd) Chromium (Cr) Lead (Pb) Mercury (Hg) Selenium (Se) Silver (Ag) Uranium (U)	8.06 5.08 <0.050 <0.50 <2.5 0.0055 <0.050 0.082 <0.00010 <0.025 <0.0050 <0.25		0.10 0.10 0.050 0.50 2.5 0.0050 0.050 0.050 0.00010 0.025 0.0050 0.25	pH units pH units mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L		10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19 11-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19	R4707981 R4707981 R4706228 R4706228 R4706228 R4706228 R4706228 R4706228 R4707777 R4706228 R4706228
L2305146-6 Q6 Sampled By: JM/MT on 03-JUL-19 @ 13:02 Matrix: SOLID Sample Preparation							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305146-6 Q6 Sampled By: JM/MT on 03-JUL-19 @ 13:02 Matrix: SOLID Sample Preparation Initial pH Final pH TCLP Metals Arsenic (As) Barium (Ba) Boron (B) Cadmium (Cd) Chromium (Cr) Lead (Pb) Mercury (Hg) Selenium (Se) Silver (Ag) Uranium (U)	9.57 5.11 <0.050 <0.50 <2.5 <0.0050 <0.050 <0.050 <0.00010 <0.025 <0.0050 <0.25		0.10 0.10 0.050 0.50 2.5 0.0050 0.050 0.050 0.00010 0.025 0.0050 0.25	pH units pH units mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L		10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19 11-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19	R4707981 R4707981 R4706228 R4706228 R4706228 R4706228 R4706228 R4706228 R4707777 R4706228 R4706228 R4706228
L2305146-7 Q7 Sampled By: JM/MT on 03-JUL-19 @ 13:04 Matrix: SOLID Sample Preparation Initial pH Final pH TCLP Metals Arsenic (As) Barium (Ba) Boron (B) Cadmium (Cd) Chromium (Cr) Lead (Pb) Mercury (Hg) Selenium (Se) Silver (Ag) Uranium (U)	8.80 5.07 <0.050 <0.50 <2.5 <0.0050 <0.050 0.314 <0.00010 <0.025 <0.0050 <0.25		0.10 0.10 0.050 0.50 2.5 0.0050 0.050 0.050 0.00010 0.025 0.0050 0.25	pH units pH units mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L		10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19 11-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19	R4707981 R4707981 R4706228 R4706228 R4706228 R4706228 R4706228 R4706228 R4707777 R4706228 R4706228 R4706228
L2305146-8 Q8 Sampled By: JM/MT on 03-JUL-19 @ 13:06 Matrix: SOLID Sample Preparation Initial pH Final pH TCLP Metals Arsenic (As) Barium (Ba) Boron (B) Cadmium (Cd) Chromium (Cr)	8.44 5.08 <0.050 <0.50 <2.5 <0.0050 <0.050		0.10 0.10 0.050 0.50 2.5 0.0050 0.050	pH units pH units mg/L mg/L mg/L mg/L mg/L		10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19 10-JUL-19	R4707981 R4707981 R4706228 R4706228 R4706228 R4706228 R4706228

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305146-8	Q8							
Sampled By:	JM/MT on 03-JUL-19 @ 13:06							
Matrix:	SOLID							
TCLP Metals								
Lead (Pb)		0.089		0.050	mg/L		10-JUL-19	R4706228
Mercury (Hg)		<0.00010		0.00010	mg/L		11-JUL-19	R4707777
Selenium (Se)		<0.025		0.025	mg/L		10-JUL-19	R4706228
Silver (Ag)		<0.0050		0.0050	mg/L		10-JUL-19	R4706228
Uranium (U)		<0.25		0.25	mg/L		10-JUL-19	R4706228

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
HG-TCLP-WT	Waste	Mercury (CVAA) for O.Reg 347	EPA 1631E

This analysis is carried out in accordance with the extraction procedure outlined in "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods Volume 1C" SW-846 EPA Method 1311, published by the United States Environmental Protection Agency (EPA). In summary, the sample is extracted at a 20:1 liquid to solids ratio for 16 to 20 hours using either extraction fluid #1 (glacial acetic acid, water and sodium hydroxide) or extraction fluid #2 (glacial acetic acid), depending on the pH of the original sample. The extract is then filtered through a 0.6 to 0.8 micron glass fibre filter and analysed using atomic absorption spectrophotometry (EPA 1631E).

LEACH-TCLP-WT	Waste	Leachate Procedure for Reg 347	EPA 1311
Inorganic and Semi-Volatile Organic contaminants are leached from waste samples in strict accordance with US EPA Method 1311, "Toxicity Characteristic Leaching Procedure" (TCLP). Test results are reported in leachate concentration units (normally mg/L).			

MET-TCLP-WT	Waste	O.Reg 347 TCLP Leachable Metals	EPA 6020B
-------------	-------	---------------------------------	-----------

This analysis is carried out in accordance with the extraction procedure outlined in "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods Volume 1C" SW-846 EPA Method 1311, published by the United States Environmental Protection Agency (EPA). In summary, the sample is extracted at a 20:1 liquid to solids ratio for 16 to 20 hours using either extraction fluid #1 (glacial acetic acid, water and sodium hydroxide) or extraction fluid #2 (glacial acetic acid), depending on the pH of the original sample. The extract is then filtered through a 0.6 to 0.8 micron glass fibre filter. Instrumental analysis of the digested extract is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020B).

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

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

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

- mg/kg - milligrams per kilogram based on dry weight of sample
- mg/kg wwt - milligrams per kilogram based on wet weight of sample
- mg/kg lwt - milligrams per kilogram based on lipid weight of sample
- mg/L - unit of concentration based on volume, parts per million.

- < - Less than.
- D.L. - The reporting limit.
- N/A - Result not available. Refer to qualifier code and definition for explanation.

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



Quality Control Report

Workorder: L2305146

Report Date: 11-JUL-19

Page 1 of 3

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: Matthew Tracey

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-TCLP-WT		Waste						
Batch	R4707777							
WG3101054-3	DUP	L2304469-1						
Mercury (Hg)		<0.00010	<0.00010	RPD-NA	mg/L	N/A	50	11-JUL-19
WG3101054-2	LCS							
Mercury (Hg)			109.0		%		70-130	11-JUL-19
WG3101054-1	MB							
Mercury (Hg)			<0.00010		mg/L		0.0001	11-JUL-19
WG3101054-4	MS	L2304469-1						
Mercury (Hg)			101.5		%		50-140	11-JUL-19
MET-TCLP-WT		Waste						
Batch	R4706228							
WG3100753-4	DUP	WG3100753-3						
Silver (Ag)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	50	10-JUL-19
Arsenic (As)		<0.050	<0.050	RPD-NA	mg/L	N/A	50	10-JUL-19
Boron (B)		<2.5	<2.5	RPD-NA	mg/L	N/A	50	10-JUL-19
Barium (Ba)		<0.50	<0.50	RPD-NA	mg/L	N/A	50	10-JUL-19
Cadmium (Cd)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	50	10-JUL-19
Chromium (Cr)		<0.050	<0.050	RPD-NA	mg/L	N/A	50	10-JUL-19
Lead (Pb)		<0.050	<0.050	RPD-NA	mg/L	N/A	50	10-JUL-19
Selenium (Se)		<0.025	<0.025	RPD-NA	mg/L	N/A	50	10-JUL-19
Uranium (U)		<0.25	<0.25	RPD-NA	mg/L	N/A	50	10-JUL-19
WG3100753-2	LCS							
Silver (Ag)			100.5		%		70-130	10-JUL-19
Arsenic (As)			99.0		%		70-130	10-JUL-19
Boron (B)			96.4		%		70-130	10-JUL-19
Barium (Ba)			98.2		%		70-130	10-JUL-19
Cadmium (Cd)			97.1		%		70-130	10-JUL-19
Chromium (Cr)			99.8		%		70-130	10-JUL-19
Lead (Pb)			101.4		%		70-130	10-JUL-19
Selenium (Se)			97.2		%		70-130	10-JUL-19
Uranium (U)			100.4		%		70-130	10-JUL-19
WG3100753-1	MB							
Silver (Ag)			<0.0050		mg/L		0.005	10-JUL-19
Arsenic (As)			<0.050		mg/L		0.05	10-JUL-19
Boron (B)			<2.5		mg/L		2.5	10-JUL-19
Barium (Ba)			<0.50		mg/L		0.5	10-JUL-19



Quality Control Report

Workorder: L2305146

Report Date: 11-JUL-19

Page 2 of 3

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

Contact: Matthew Tracey

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-TCLP-WT		Waste						
Batch	R4706228							
WG3100753-1	MB							
Cadmium (Cd)			<0.0050		mg/L		0.005	10-JUL-19
Chromium (Cr)			<0.050		mg/L		0.05	10-JUL-19
Lead (Pb)			<0.050		mg/L		0.05	10-JUL-19
Selenium (Se)			<0.025		mg/L		0.025	10-JUL-19
Uranium (U)			<0.25		mg/L		0.25	10-JUL-19
WG3100753-5	MS	WG3100753-3						
Silver (Ag)			119.8		%		50-140	10-JUL-19
Arsenic (As)			106.8		%		50-140	10-JUL-19
Boron (B)			101.1		%		50-140	10-JUL-19
Barium (Ba)			102.4		%		50-140	10-JUL-19
Cadmium (Cd)			102.3		%		50-140	10-JUL-19
Chromium (Cr)			103.7		%		50-140	10-JUL-19
Lead (Pb)			102.0		%		50-140	10-JUL-19
Selenium (Se)			107.2		%		50-140	10-JUL-19
Uranium (U)			103.1		%		50-140	10-JUL-19

Quality Control Report

Workorder: L2305146

Report Date: 11-JUL-19

Client: Baffinland Iron Mine's Corporation (Oakville)
2275 Upper Middle Rd. E. Suite #300
Oakville ON L6H 0C3

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Contact: Matthew Tracey

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



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

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

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OCTOBER 2015 FROM