

#### **APPENDIX E.8.3**

**WSCC Inspection Reports** 



Mining

**Report Reference:** 

Inspection #: 2020-VM-00277

**OPERATOR** 

BAFFINLAND IRON MINES CORPORATION 2275 Upper Middle Road East Suite 300 Oakville, Ontario L6H 0C3

INSPECTOR

Viktor Mubili

MINE

Mary River Mine Site - Emulsion Plant MINE MANAGER Sylvain Proulx

Inspection Date: February 19, 2020

#### **Inspection Details:**

A general inspection of the **Mary River Emulsion Plant** was carried out on February 19, 2020. Present on the inspection visit were Elwin Murley (Dyno Plant Operator), Kevin McDonald (Dyno Site Supervisor) and Jeff Jamieson (BIM HS&S Superintendent).

There were no concerns observed with eyewash stations, fire extinguisher inspection tags, housekeeping and electrical grounding, and the labeling of Teck cables as ordered in December 2019 is ongoing and near completion.

Some concerns were identified and orders issued:

001 - No valid supervisor certificate for Site Supervisor;

002 - Electrical panel board in Module E Compressor Room found with no warning label; and

003 - No dust mask warning for AN Handling Module J Room.



Mining

Report Reference:

Inspection #: 2020-VM-00277

Order Number: 2020-VM-00277-001 Status: Open

Required Compliance Date: March 27, 2020

**Contractor:** DYNO NOBEL BAFFIN ISLAND INC.

**Sub-Location:** Supervision

**Observations:** The Site Supervisor has no valid supervisor certificate. His certificate expired a

while ago, but he explained that he had left employment and just rejoined.

Order: Ensure every supervisor has a valid certificate at all times. The site supervisor

must, therefore, immediately obtain a provisional certificate while he is making

arrangements to renew his expired certificate.

**Legislation:** Mine Health & Safety Regulations(Nunavut)

**Section 5.02. (1):** Subject to subsection (2), the manager shall ensure that every person working in

the mining activity of an open pit mine is under the supervision of

(a) the holder of an open pit supervisor's certificate, level II, if no drilling or

blasting is being done; or

(b) the holder of an open pit shift boss certificate, in any other case. R-016-

2003,s.49.

**Section 7.13:** A manager may issue a provisional shift boss certificate to a person who (a) has

applied to the Panel for a shift boss certificate; (b) fulfils the requirements set out in paragraphs 7.07(a) to (d); and (c) demonstrates, to the satisfaction of the manager, an adequate knowledge of the Act and the regulations relevant to the

authority and responsibility to be assigned to the person.



Mining

**Report Reference:** 

Inspection #: 2020-VM-00277

Order Number: 2020-VM-00277-002 Status: Open

Required Compliance Date: March 27, 2020

Contractor: DYNO NOBEL BAFFIN ISLAND INC.

**Sub-Location:** Module E Compressor Room

(2):

**Observations:** Electrical panel board in the Module E Compressor Room is not identified as to its

voltage and has no "Danger..." warning label.

Order: Identify panel boards with "Danger..." warning notices along with their voltages,

and ensure to include "Authorized Personnel Only" in warning labels on access

doors into high voltage rooms.

**Legislation:** Mine Health & Safety Regulations(Nunavut)

**Section 13.01.** Except where otherwise required by these regulations, the electrical system and

electrical equipment shall meet or exceed the requirements of CSA Standard

CAN/CSA M421-93, Use of Electricity in Mines.



Mining

**Report Reference:** 

Inspection #: 2020-VM-00277

**Order Number:** 2020-VM-00277-003 **Status:** Open

Required Compliance Date: March 23, 2020

Contractor: DYNO NOBEL BAFFIN ISLAND INC.

**Sub-Location:** Ammonium Nitrate Handling Module J Room

**Observations:** There was found no dust mask warning at the AN Handling Module J confined

room.

Order: Install a warning label for dust protection on the access door of the AN Handling

Module J Room, and ensure workers are trained in the use of dust masks as

needed.

**Legislation:** Mine Health & Safety Regulations(Nunavut)

**Section 8.29.(a):** A person without self-contained breathing apparatus shall not enter a confined

space in which a harmful atmosphere might exist or develop until tests have been made to determine the nature and quantity of harmful vapours, gases, fumes, mists, dusts, and the oxygen content of the atmosphere inside the confined space

and the test results have been recorded in a logbook kept for that purpose;

**Section 9.03.1:** Wherever practicable, the manager, after consultation with the Committee, may

develop procedures for the use of water sprays and other dust suppression devices or personal protective equipment to be used at every dusty work site. R-

016-2003,s.91.



Mining

Report Reference:

Inspection #: 2020-VM-00277

#### **Regulatory Requirements**

This report has been issued pursuant to Section 26 of the *Mine Health and Safety Act* which states that a closeout meeting will be held with the manager after completing the inspection and that a written report will follow within 72 hours after the last day of the inspection.

Pursuant to section 28 the manager shall post all inspection reports and orders issued by an inspector in a conspicuous place at the mine for at least 30 days after the manager receives the inspection report or order. Furthermore; pursuant to section 29. (1) the manager shall, within 30 days after receiving an inspection report, submit a written report to the Chief Inspector outlining the remedial measures taken and the remedial measures still to be taken in respect of the inspection report.

Pursuant to section 32. (1) A person who is adversely affected by a decision or order issued by an inspector may appeal the decision or order, in writing, to the Chief Inspector within 30 days after its issue.

eceived By:		
received by.	Employer Representative (Print)	Signature
		Inspector Signature

P9⊲ UU, Pc ⊲DV σP4c V v, UDc D, Le, All C.

Una titiraq piinnarialik Inuinnaqtun piyumayaukpat. Ce document est disponible en français sur demande.



Mining

Report Reference:

Inspection #: 2020-VM-00271

**OPERATOR** 

BAFFINLAND IRON MINES CORPORATION 2275 Upper Middle Road East Suite 300 Oakville, Ontario L6H 0C3

**INSPECTOR** 

Viktor Mubili

MINE

Mary River Mine Site – Milne Explosives

MINE MANAGER

Sylvain Proulx

*Inspection Date:* February 19, 2020

#### **Inspection Details:**

A general inspection was conducted at the **Milne Port Ammonium Nitrate (AN) storage area and Explosives Magazines** respectively. Present for the inspection were Adam James (BIM Site Services Lead Hand) and Jeff Jamieson (BIM HS&S Superintendent).

There were no concerns observed with the AN storage generally and housekeeping of the warehouse.

Some concerns were identified and orders issued:

- 001 No AN inventory found at Warehouse;
- 002 Explosives Magazines at KM 6.5 not accessible; and
- 003 Insufficient warning signs for Explosives Magazines at KM 6.5.



Mining

Report Reference:

Inspection #: 2020-VM-00271

Order Number: 2020-VM-00271-001 Status: Open

Required Compliance Date: March 26, 2020

**Sub-Location:** Milne Warehouse

**Observations:** There was found no inventory of the AN at the Milne Warehouse. Only dispatch

manifests are available.

Per Section 14.01 of the Mine Health and Safety Regulations (Nunavut), explosives

ingredients/agents, which AN is, are classified under explosives.

Order: Establish and maintain an inventory of all AN received and issued at Milne Port,

and ensure AN storage seacans are identified.

**Legislation:** Mine Health & Safety Regulations(Nunavut)

Section 14.08.

(1)(b):

Each magazine shall be operated and maintained in accordance with the following rules: at a mine, a record shall be kept of all explosives issued and received and the inventory of the surface magazine in a logbook, and all entries shall be signed

by the authorized person;

Section 9.08.

(1)(a):

The manager shall ensure that all dangerous or potentially hazardous materials or substances, including arsenic dust, are stored in designated storage areas located on the surface or underground acceptable to the chief inspector that are clearly

identified by signs, placards or similar devices;



Mining

**Report Reference:** 

Inspection #: 2020-VM-00271

Order Number: 2020-VM-00271-002 Status: Open

Required Compliance Date: March 24, 2020

**Sub-Location:** KM 6.5 Explosives/Cap Magazines

**Observations:** Explosives/Cap Magazines at KM 6.5 were found not accessible. The reason given

by mine officials is that they have not been in use since the contractors left site

last year.

(1)(a):

Order: Ensure the Magazines are accessible at all times for emergencies and weekly

inspections, as required.

**Legislation:** Mine Health & Safety Regulations(Nunavut)

**Section 14.08.** Each magazine shall be operated and maintained in accordance with the following

rules: the magazine shall be in the charge of an authorized person who shall carry

out a weekly inspection of the magazine and record the results in a logbook;



Mining

**Report Reference:** 

Inspection #: 2020-VM-00271

Order Number: 2020-VM-00271-003 Status: Open

Required Compliance Date: March 24, 2020

**Sub-Location:** KM 6.5 Explosives/Cap Magazines

**Observations:** The warning signs for Explosives Magazines at KM 6.5 were found insufficient.

Order: Install suitable warning signs, as prescribed by the Regulations.

**Legislation:** Mine Health & Safety Regulations(Nunavut)

**Section** The manager shall ensure that suitable warning signs identify all fire hazard areas,

**12.11.(b):** including explosives storage areas;

**Section 14.03.** The manager shall ensure that "NO SMOKING OR OPEN FLAME" signs are posted

(4): at all approaches to a magazine.

**Section 14.03.** Explosives stored on the surface shall be kept in a magazine with "DANGER

**(6):** EXPLOSIVES" signs conspicuously posted at all approaches to the magazine and on

each side of the magazine.



Mining

Report Reference:

Inspection #: 2020-VM-00271

#### **Regulatory Requirements**

This report has been issued pursuant to Section 26 of the *Mine Health and Safety Act* which states that a closeout meeting will be held with the manager after completing the inspection and that a written report will follow within 72 hours after the last day of the inspection.

Pursuant to section 28 the manager shall post all inspection reports and orders issued by an inspector in a conspicuous place at the mine for at least 30 days after the manager receives the inspection report or order. Furthermore; pursuant to section 29. (1) the manager shall, within 30 days after receiving an inspection report, submit a written report to the Chief Inspector outlining the remedial measures taken and the remedial measures still to be taken in respect of the inspection report.

Pursuant to section 32. (1) A person who is adversely affected by a decision or order issued by an inspector may appeal the decision or order, in writing, to the Chief Inspector within 30 days after its issue.

Received By:		
	Employer Representative (Print)	Signature
		Inspector Signature

P9⊲ UU, Pc ⊲DV σP4c V v, UDc D, Le, All C.

Una titiraq piinnarialik Inuinnaqtun piyumayaukpat. Ce document est disponible en français sur demande.



Mining

**Report Reference:** 

Inspection #: 2020-VM-00278

**OPERATOR** 

BAFFINLAND IRON MINES CORPORATION 2275 Upper Middle Road East Suite 300 Oakville, Ontario L6H 0C3

**INSPECTOR** 

Viktor Mubili

MINE

Mary River Mine Site - Mary River Camp MINE MANAGER Sylvain Proulx

Inspection Date: February 20, 2020

#### **Inspection Details:**

A general inspection was conducted at the **Mary River Main Camp and Kitchen**. Present for the inspection visit were Boyd Hollett (Horizon Chef), Tricia Graves (Horizon Assistant Chef), Steve Muir (BIM Maintenance Electrician) and Jeff Jamieson (BIM HS&S Superintendent).

There were no concerns found with shelf carrying-capacity labels, housekeeping, storage and supervisor certificates, and a fire drill has been scheduled ahead of the due date.

Some concerns were observed and orders issued:

- 001 No fire extinguisher in the dry storage room;
- 002 Two sets of light tubes found with no covers; and
- 003 Electrical panel board found with no warning label.



Mining

Report Reference:

Inspection #: 2020-VM-00278

Order Number: 2020-VM-00278-001 Status: Open

Required Compliance Date: March 26, 2020

Contractor: HORIZON NORTH CAMP & CATERING PARTNERSHIP

**Sub-Location:** Dry Storage Room

**Observations:** There is no fire extinguisher in the dry storage room.

Order: Install a fire extinguisher, and ensure all exit doors have fire extinguishers that

are ready for purpose, as required.

**Legislation:** Mine Health & Safety Regulations(Nunavut)

**Section 12.01.** The manager s

(1)(c):

The manager shall ensure that a fire risk assessment is carried out not later than March 31 in each calendar year for all parts of the mine, both underground and surface, and the assessment shall identify the need for fire protection and the type of fire protection that should be provided; and



Mining

Report Reference:

Inspection #: 2020-VM-00278

**Order Number:** 2020-VM-00278-002 **Status:** Open

Required Compliance Date: March 31, 2020

Contractor: HORIZON NORTH CAMP & CATERING PARTNERSHIP

**Sub-Location:** Loading Bay & Storage Area

(2):

**Observations:** Two sets of light tubes in the loading bay and storage area respectively were

found with no covers.

Order: Install lighting covers to prevent injury from inadvertent tube fall.

**Legislation:** Mine Health & Safety Regulations(Nunavut)

**Section 13.01.** Except where otherwise required by these regulations, the electrical system and

electrical equipment shall meet or exceed the requirements of CSA Standard

CAN/CSA M421-93, Use of Electricity in Mines.



Mining

Report Reference:

Inspection #: 2020-VM-00278

**Order Number:** 2020-VM-00278-003 **Status:** Open

Required Compliance Date: March 31, 2020

Contractor: HORIZON NORTH CAMP & CATERING PARTNERSHIP

**Sub-Location:** Dry Storage Area

(2):

**Observations:** Electrical panel board in the Dry Storage Area is not identified as to its voltage and

has no "Danger..." warning notice.

Order: Identify all panel boards with "Danger..." warning notices along with their

voltages.

**Legislation:** Mine Health & Safety Regulations(Nunavut)

**Section 13.01.** Except where otherwise required by these regulations, the electrical system and

electrical equipment shall meet or exceed the requirements of CSA Standard

CAN/CSA M421-93, Use of Electricity in Mines.



# Inspection Report Mining

Report Reference:

Inspection #: 2020-VM-00278

#### **Regulatory Requirements**

This report has been issued pursuant to Section 26 of the *Mine Health and Safety Act* which states that a closeout meeting will be held with the manager after completing the inspection and that a written report will follow within 72 hours after the last day of the inspection.

Pursuant to section 28 the manager shall post all inspection reports and orders issued by an inspector in a conspicuous place at the mine for at least 30 days after the manager receives the inspection report or order. Furthermore; pursuant to section 29. (1) the manager shall, within 30 days after receiving an inspection report, submit a written report to the Chief Inspector outlining the remedial measures taken and the remedial measures still to be taken in respect of the inspection report.

Pursuant to section 32. (1) A person who is adversely affected by a decision or order issued by an inspector may appeal the decision or order, in writing, to the Chief Inspector within 30 days after its issue.

Employer Representative (Print)	Signature
	Inspector Signature

P9⊲ UU, Pc ⊲DV σP4c V v, UDc D, Le, All C.

Una titiraq piinnarialik Inuinnaqtun piyumayaukpat. Ce document est disponible en français sur demande.



Mining

**Report Reference:** 

Inspection #: 2020-VM-00276

**OPERATOR** 

BAFFINLAND IRON MINES CORPORATION 2275 Upper Middle Road East Suite 300 Oakville, Ontario L6H 0C3

INSPECTOR

Viktor Mubili

MINE

Mary River Mine Site – **Mine Operations** *MINE MANAGER*Sylvain Proulx

Inspection Date: February 20, 2020

#### **Inspection Details:**

A general inspection of the Mary River Mine Ops and Heavy Duty Maintenance Shop was carried out. Present for the inspection tour were Shawn LeBlanc (BIM Training Supervisor), Paul Dawb (BIM Mine Tech), Elwin Murley (Dyno Plant Operator), William Garrett Corn (Dyno Blaster), Jeff Harris (BIM Senior Maintenance Supervisor) and Jeff Jamieson (BIM HS&S Superintendent).

There were no concerns found with validity of supervisor and shift boss certificates, rotation of explosives, explosives inventory, magazine permits, maintenance shop lighting and maintenance shop warning signs.

Some deficiencies were identified and orders issued:

- 001 Incomplete Ground Control Log-Book and no designated engineer;
- 002 Insufficient warning signs for Explosives Magazines access;
- 003 Incomplete explosives issuing records;
- 004 Magazine grounding not observed;
- 005 No monthly inspection for fire extinguishers in Maintenance Shop;
- 006 Poor housekeeping in Maintenance Shop; and
- 007 No fire suppression for lube/fuel dispensing station in Maintenance Shop.



Mining

**Report Reference:** 

Inspection #: 2020-VM-00276

Order Number: 2020-VM-00276-001 Status: Open

Required Compliance Date: March 31, 2020

**Sub-Location:** Mine Ops

**Observations:** Ground Control Log-Book was found with no designated engineer sign off, and it

became apparent after further inquiry that the mine has no ground control

engineer.

Order: Ensure Ground Control Log-Book is updated daily and signed off by supervisor

and designated engineer. The mine also needs a ground control engineer.

**Legislation:** Mine Health & Safety Regulations(Nunavut)

**Section 1.27:** The ground control logbook shall be read and signed each day by the shift boss

and by the mine engineer designated by the manager. R-016-2003,s.6.



Mining

Report Reference:

Inspection #: 2020-VM-00276

Order Number: 2020-VM-00276-002 Status: Open

Required Compliance Date: March 30, 2020

**Sub-Location:** Magazines Access Area

**Observations:** The warning signs at the Explosives Magazines access area were found

insufficient.

Order: Install suitable warning signs, as prescribed by the Regulations.

**Legislation:** Mine Health & Safety Regulations(Nunavut)

**Section 14.03.** The manager shall ensure that "NO SMOKING OR OPEN FLAME" signs are posted

(4): at all approaches to a magazine.

**Section 14.03.** Explosives stored on the surface shall be kept in a magazine with "DANGER

**(6):** EXPLOSIVES" signs conspicuously posted at all approaches to the magazine and on

each side of the magazine.



Mining

**Report Reference:** 

Inspection #: 2020-VM-00276

Order Number: 2020-VM-00276-003 Status: Open

Required Compliance Date: March 13, 2020

**Sub-Location:** Explosives Magazine

**Observations:** Explosives issuing records in Magazine 488 were found incomplete - without date

and type. This ommission was brought to the attention of the blaster who

corrected it immediately during the time of inspection.

Order: Ensure explosives issuing records are filled out correctly and completely at the

time of issuing, as required.

**Legislation:** Mine Health & Safety Regulations(Nunavut)

Section 14.08.

(1)(b):

Each magazine shall be operated and maintained in accordance with the following rules: at a mine, a record shall be kept of all explosives issued and received and the inventory of the surface magazine in a logbook, and all entries shall be signed

by the authorized person;



Mining

**Report Reference:** 

Inspection #: 2020-VM-00276

Order Number: 2020-VM-00276-004 Status: Open

Required Compliance Date: March 26, 2020

**Sub-Location:** Magazine Grounding

**Observations:** Bonding on Explosives Magazine 488 could not be visually inspected, due to snow

pill-up, and no one was sure about its existence.

Order: Ensure all magazines are bonded to ground electrodes complying with the CEC.

**Legislation:** Mine Health & Safety Regulations(Nunavut)

Section 13.01.

(2):

Except where otherwise required by these regulations, the electrical system and electrical equipment shall meet or exceed the requirements of CSA Standard

CAN/CSA M421-93, Use of Electricity in Mines.

**Section 14.07:** All metal parts of a magazine or area where explosives are prepared such as

framing, cladding, piping, cable armour and any electrical components shall be permanently bonded to ground in accordance with the requirements of CSA

Standard C22.1-94, Canadian Electrical Code, Part I.



Mining

**Report Reference:** 

Inspection #: 2020-VM-00276

**Order Number:** 2020-VM-00276-005 **Status:** Open

Required Compliance Date: March 27, 2020

**Sub-Location:** Heavy Duty Maintenance Shop

**Observations:** Fire extinguishers in the Maintenance Shop have not been inspected in 2020.

Order: Comply with the regulations and the Mine Policies and Procedures by ensuring

that fire extinguishers in the Heavy Duty Maintenance Shop and the Mine Site spread are checked, ready for use and placed where they are required and easily

Every fire suppression system and every fire extinguisher shall be examined once a

reachable.

Section 10.42.

**Legislation:** Mine Health & Safety Regulations(Nunavut)

(5): month to ensure that it is in good working order. R-026-99,s.29.

Section 12.01. The manager shall ensure that a fire risk assessment is carried out not later than (1)(c): March 31 in each calendar year for all parts of the mine, both underground and

surface, and the assessment shall identify the need for fire protection and the

type of fire protection that should be provided; and



Mining

Report Reference:

Inspection #: 2020-VM-00276

Order Number: 2020-VM-00276-006 Status: Open

Required Compliance Date: April 03, 2020

**Sub-Location:** Heavy Duty Maintenance Shop

**Observations:** There is general poor housekeeping in the Heavy Duty Maintenance Shop, which

is a safety hazard.

Order: Establish a housekeeping program and maintain good housekeeping going

forward.

**Legislation:** Mine Health & Safety Regulations(Nunavut)

**Section 9.04:** The manager shall develop and implement an effective housekeeping program to

ensure that

(a) all work sites and travelways are maintained in a safe condition;

(b) materials and equipment are stored in a manner so as not to endanger

persons; and

(c) appropriate action is taken whenever necessary to maintain a hazard-free

environment.



Mining

Report Reference:

Inspection #: 2020-VM-00276

Order Number: 2020-VM-00276-007 Status: Open

Required Compliance Date: April 22, 2020

**Sub-Location:** Heavy Duty Maintenance Shop

**Observations:** At the lube/fuel dispensing station, inside the truck repair bay, there is no fire

suppression system. There were no other visible hazards, other than poor

housekeeping, identified at the time of the inspection.

Order: Ensure that enclosures where oil, grease or flammable materials are dispensed

are equipped with an automatically activated fire suppression system that has been properly designed and installed to provide effective fire control, and preferably install a fire door, that meets the requirements of these regulations and the *National Fire Code*, to ensure minimal effect from a fire or explosion

inside the shop.

**Legislation:** Mine Health & Safety Regulations(Nunavut)

**Section 10.111:** A fuel transfer system shall be equipped with a fire suppression system and shall

have adequate fire extinguishers.

Section 12.04.

(1)(e) (i):

The manager shall ensure that all underground garages, oil and gas storage areas and fuelling stations where required by an inspector, in garages where oil, grease, or flammable material is stored, are equipped with an automatically activated fire suppression system that has been properly designed and installed to provide

effective fire control, and



# Inspection Report Mining

-

Inspection #: 2020-VM-00276

Report Reference:

#### **Regulatory Requirements**

This report has been issued pursuant to Section 26 of the *Mine Health and Safety Act* which states that a closeout meeting will be held with the manager after completing the inspection and that a written report will follow within 72 hours after the last day of the inspection.

Pursuant to section 28 the manager shall post all inspection reports and orders issued by an inspector in a conspicuous place at the mine for at least 30 days after the manager receives the inspection report or order. Furthermore; pursuant to section 29. (1) the manager shall, within 30 days after receiving an inspection report, submit a written report to the Chief Inspector outlining the remedial measures taken and the remedial measures still to be taken in respect of the inspection report.

Pursuant to section 32. (1) A person who is adversely affected by a decision or order issued by an inspector may appeal the decision or order, in writing, to the Chief Inspector within 30 days after its issue.

Received By:	Please return a signed copy of this page as	confirmation of receipt.
	Employer Representative (Print)	Signature
		Inspector Signature
Translation Reques	sts	

Una titiraq piinnarialik Inuinnaqtun piyumayaukpat.

D94 UU#Pc 4DV-FD4 54 UU#PP4

Ce document est disponible en français sur demande.

Mining

**Report Reference:** 

Inspection #: 2020-VM-02368

**OPERATOR** 

BAFFINLAND IRON MINES CORPORATION 2275 Upper Middle Road East Suite 300 Oakville, Ontario L6H 0C3

**INSPECTOR** 

Viktor Mubili

MINE

Mary River Mine Site – **620 Bench Highwall** *MINE MANAGER*Sylvain Proulx

Inspection Date: August 17, 2020

#### **Inspection Details:**

I, Viktor Mubili, and the WSCC subject matter expert conducted a review of the **August 12, 2020 rock fall incident** from August 17-21, 2020. The review was necessitated by the 610 catch bench inability to contain the entire volume of the failure. From the photo it appears the 610 bench width is less than design at the failure location, which makes it unsafe to go onto the 610 Bench to remove the material. The photo also appears to show that the as-constructed width of other benches around the pit may also be less than design (and possibly less than 8m).

It appears that adequate catchment remains on the 590m bench, as the overspill material was caught on the 590m Bench, and did not reach the working bench at 580m. And the proposed action plan to install catch berms below the rockfall on the working level, per the SOP "Working Near Slopes and Catch Bench Maintenance", is accepted practice to protect workers from rockfall.

However, it appears the Biweekly Pit Wall Audits and Terrace Stability Audits specified in the Ground Control Management Plan (GCMP) are not consistently completed. The Phase I pit was approved based on designs presented by Golder in "Geotechnical Review of the Updated 5 Year Pit, Deposit 1 Open Pit Mary River Baffinland", dated March 28, 2017. The Phase I submitted design did not include all the details and verification typical for approval of a multi-bench mining system as it was understood that the Pit design was conservative, and that experience and knowledge gained during mining the Phase I Pit would be used to design the Phase II pit. Therefore, the need to bring the Chief Inspector up to speed with the report and current practices has necessitated issuance of this request for information order: 001 - Request for SOP, notes and bench width assessment.



Mining

Report Reference:

Inspection #: 2020-VM-02368

Order Number: 2020-VM-02368-001 Status: Open

Required Compliance Date: October 01, 2020

**Sub-Location:** 620 Bench Highwall Failure

**Observations:** In 2019, the requested SOP for working near slopes has not been submitted. As

> well, the GCMP specifies completion of Biweekly Pit Wall Audits and Terrace Stability Audits. Events such as this rockfall should be noted in these inspections

along with notes on bench capacity and where catch berms are needed.

Order: **Provide the following documents:** 

SOP "Working Near Slopes and Catch Bench Maintenance";

2. Notes from pit wall and terrace Audits completed since May 2020; and

A map that provides an assessment of bench width performance around the pit. The assessment should identify benches with an as-constructed width that is less than the design width of 13m, and as-constructed benches that are

less than 8m.

Legislation: Mine Health & Safety Act(Nunavut)

Section 23.(c): The owner and manager of a mine being investigated or inspected by an

> inspector, and every person at the mine, shall provide the inspector with such information relevant to the administration of this Act and the regulations as the

inspector may reasonably request;

Legislation: Mine Health & Safety Regulations(Nunavut)

Section 1.137. Where a surface mine is worked in benches,

(a) each catchment berm shall be designed so that its final width will not be less (1):

than 8 m; and

(b) loose rock shall not be allowed to accumulate on a bench or catchment berm

in a manner that endangers any person working on a lower bench.

**Section 1.137.** 

The manager shall, in consultation with the Committee, develop a procedure (2): acceptable to the chief inspector, that provides for the safety of workers should

loose rock accumulate on a catchment berm and access to clean it not be possible.



Mining

Report Reference: Inspection #: 2020-VM-02368

#### **Regulatory Requirements**

This report has been issued pursuant to Section 26 of the *Mine Health and Safety Act* which states that a closeout meeting will be held with the manager after completing the inspection and that a written report will follow within 72 hours after the last day of the inspection.

Pursuant to section 28 the manager shall post all inspection reports and orders issued by an inspector in a conspicuous place at the mine for at least 30 days after the manager receives the inspection report or order. Furthermore; pursuant to section 29. (1) the manager shall, within 30 days after receiving an inspection report, submit a written report to the Chief Inspector outlining the remedial measures taken and the remedial measures still to be taken in respect of the inspection report.

Pursuant to section 32. (1) A person who is adversely affected by a decision or order issued by an inspector may appeal the decision or order, in writing, to the Chief Inspector within 30 days after its issue.

Received By:		
, –	Employer Representative (Print)	Signature
		Inspector Signature
Translation Reques	rte.	

▶d◀ ∩∩%b° ◀⊃∆°╸▶ゼ° Д♪°∩⊃° ⊃°건Ġ~J°<C.
Una titiraq piinnarialik Inuinnaqtun piyumayaukpat.

Ce document est disponible en français sur demande.

Mining

**Report Reference:** 

Inspection #: 2020-VM-03402

**OPERATOR** 

BAFFINLAND IRON MINES CORPORATION 2275 Upper Middle Road East Suite 300 Oakville, Ontario L6H 0C3 MINE
Mary River Mine Site
MINE MANAGER

Sylvain Proulx

**INSPECTOR** 

Viktor Mubili

Inspection Date: December 11, 2020

#### **Inspection Details:**

I, Viktor Mubili, and the WSCC subject matter consultant conducted a **2020 desktop geotechnical review** for Baffinland Mary River Mine from December 7-11, 2020, in lieu of a site inspection, due to the ongoing Covid-19 pandemic. The desktop review included an audit of previous WSCC geotechnical inspections, and a review of various requested documents. The focus of the desktop review was to assess if the operation has satisfactorily addressed issues identified in previous geotechnical inspections, and is meeting the intent of the geotechnical requirements of the *Mine Health and Safety Regulations* (MHSR) as well as accepted engineering practices for geotechnical design, construction, and operation affecting health and safety.

Most of the orders from geotechnical inspections completed in 2019, 2017, 2016 and 2015 have been satisfactorily addressed.

However, three recommendations from the 2019 inspection remain outstanding. Along with these, some other deficiencies were identified and an order, collectively covering all deficiencies, issued. A copy of the consultant's report has been attached hereto for details and clarity of this order:

001 - Deficiencies from the 2019 inspection, Open Pits, Waste Rock Storage Facility and QMR2 Quarry.



Mining

**Report Reference:** 

Inspection #: 2020-VM-03402

Order Number: 2020-VM-03402-001 Status: Open

Required Compliance Date: January 28, 2021

**Sub-Location:** Desktop Review - Geotechnical Documents

**Observations:** Deficiencies identified from the 2019 inspection, Open Pits, Waste Rock Storage

Facility and QMR2 Quarry. Details are outlined and underlined in the attached

consultant's report.

Order: Address all deficiencies and opportunities for improvement identified in the

attached consultant's report.

**Legislation:** Mine Health & Safety Act(Nunavut)

**Section 30.(a):** The chief inspector may order the owner or manager of a mine to provide, at the

expense of the owner, an independent report prepared by a professional engineer

or other qualified person acceptable to the chief inspector respecting

occupational health and safety or the safety of equipment, buildings, workings or

structures at the mine; or

**Legislation:** Mine Health & Safety Regulations(Nunavut)

**Section 1.03. (1):** The owner of a surface mine or an underground mine shall maintain a mine

design, acceptable to the chief inspector, assessing the ground stability of the

active and proposed workings of the mine.

**Section 1.05:** The mine design shall be assessed and updated by an authorized person annually

and before any major change is made to the mining method or the equipment

used.

**Section 1.144:** The manager shall make an application to the chief inspector, complete with the

supporting documents required by the chief inspector, for the written approval of the design of a proposed waste dump, dam or impoundment, and copies of the complete application shall be sent to regulatory agencies specified by the chief

inspector.



Mining

Report Reference: Inspection #: 2020-VM-03402

#### **Regulatory Requirements**

This report has been issued pursuant to Section 26 of the *Mine Health and Safety Act* which states that a closeout meeting will be held with the manager after completing the inspection and that a written report will follow within 72 hours after the last day of the inspection.

Pursuant to section 28 the manager shall post all inspection reports and orders issued by an inspector in a conspicuous place at the mine for at least 30 days after the manager receives the inspection report or order. Furthermore; pursuant to section 29. (1) the manager shall, within 30 days after receiving an inspection report, submit a written report to the Chief Inspector outlining the remedial measures taken and the remedial measures still to be taken in respect of the inspection report.

Pursuant to section 32. (1) A person who is adversely affected by a decision or order issued by an inspector may appeal the decision or order, in writing, to the Chief Inspector within 30 days after its issue.

Please return a signed copy of this page as confirmation of receipt.			
Received By: _			
	Employer Representative (Print)	Signature	
		Inspector Signature	
Translation Reques	sts		

P9⊲ UU, Pc ⊲DV σP4c V v, UDc D, Le, All C.

Una titiraq piinnarialik Inuinnaqtun piyumayaukpat. Ce document est disponible en français sur demande.

2282 Seabank Road Courtenay, B.C. V9J 1Y1 mobile (250) 703-6775 michaelcullen@shaw.ca

Workers' Safety and Compensation Commission PO Box 8888 Yellowknife, NT X1A 2R3

December 11, 2020

Attn: Cary Ingram, Chief Inspector of Mines Viktor Mubili, Senior Inspector/Engineer

**Subject:** Baffinland Mary River Mine Desktop Geotechnical Review 2020

#### Introduction

As requested by the Workers Safety and Compensation Commission (WSCC), Michael Cullen Geotechnical (MCG) has completed a desktop review of the Baffinland Mary River Mine, in lieu of a site inspection, due to the ongoing Covid-19 pandemic. The desktop review included an audit of previous WSCC geotechnical inspections, and a review of the following documents submitted by the Mine:

- Mine Operations 2020/2021 Technical Summary and Mine Plan, dated October 19, 2020, prepared by Baffinland
- Mine Operations 2019/2020 Technical Summary and Mine Plan, dated October 31, 2019, prepared by Baffinland
- Updated plans and Sections for the pit and waste rock dump (October 2020)
- Ground Control Management Plan Rev 2, dated October 12, 2020, prepared by Baffinland
- Mary River Project Feasibility Design for Deposit No. 1 Open Pit, dated April 201, prepared by Knight Piesold.
- Geotechnical Review of the Updated 5 Year Pit, Deposit 1 Open Pit Mary River Baffinland, prepared by Golder Associates, dated March 28, 2017.
- SOP: Working Near Slopes: Pit Walls, Dumps and Stockpiles, Rev2, dated September 30, 2019
- SOP: Highwall Scaling and Catch Bench Maintenance, Rev1, dated September 30, 2019.

The focus of this desktop review was to assess the following:

- 1. If the operation has satisfactorily addressed issues identified by MCG in previous WSCC geotechnical inspections.
- 2. If the operation is in conformance with the geotechnical requirements of Mine Health and Safety Regulation (MHSR).
- 3. If the operation is following accepted engineering practices for geotechnical design, construction, and operation affecting health and safety.

Recommendations are provided where the submitted information does not clearly demonstrate conformance with the MHSR, approvals, or accepted practice. These recommendations are underlined. MCG also suggests that all written recommendations made by a professional engineers affecting health and safety should be acted upon by the Mine unless an alternative recommendation is provided in writing by a qualified professional engineer. The inspection cannot practically cover the entire mine site, nor identify all geotechnical issues. Professional reliance has been used throughout the inspection.

#### **Previous WSCC Geotechnical Inspections**

MCG completed geotechnical inspections at the Baffinland Mine Operations, on behalf of WSCC, in 2019, 2017, 2016 and 2015. The following issues remain open from the 2019 inspection.

- As per clause 1.05 of the MHSR MCG recommends that Mine submit revised plans for the QMR2 quarry that demonstrate conformance with the MHSR and accepted engineering practice. The Mine should ensure the plans are properly implemented.
- As per clause 1.05 and 1.141 of the MHSR the Mine should submit plans for the Phase II Pit including application with supporting information for a multi-bench mining system.
- WSCC has not received an annual 3<sup>rd</sup> Party geotechnical review since 2017. It is understood that Golder Associates was on site to complete this work; once completed a copy of the 2019 review report should be submitted to the Chief Inspector.

Further discussion an reiteration of these recommendations are provided below.

#### **Document Review**

#### **Open Pits**

The Phase 2 Pit is now being developed. It is understood that Phase 2 will have pit walls up to 150m high and will utilize the same design criteria as the Phase 1 Pit. The Mine Operations Technical Report states that:

"The Phase 2 pit consists primarily of a western pushback of the pit and will utilize the same pit design parameters as Phase 1. The main wall of the Phase 2 pit design primarily intersects the more consistent FW rock units with a relatively limited maximum wall height as compared to the payback or ultimate pit designs presented in KP 2010. Some exposure of pit wall in the Fold/Axial area has occurred as of the writing of this report no significant performance issues have been noted in this area. Baffinland will continue to monitor the wall in this area to be able to validate the performance of the Golder 2017 slope recommendations in the area.

The Phase 1 pit utilized the following design criteria:

Bench height: 20m (2 x 10m working benches)

Design bench width: 13m

BFA: 70° IRA: 45° OSA:42°

Maximum depth:110m

WSCC approved the Phase 1 Pit based on the design criteria presented in "Geotechnical Review of the Updated 5 Year Pit, Deposit 1 Open Pit Mary River Baffinland" prepared by Golder Associates, dated March 28, 2017. The design submitted for the Phase 1 Pit did not include the details and verification typical for approval of a multi-bench mining system. At the time of WSCC approval it was understood that the experience and knowledge gained during mining the Phase I Pit would be used to design the Phase 2 (and subsequent) pits. The expectation was that the designs for the Phase 2 Pit would include additional analysis and information consistent with the requirements of the MHSR and accepted practice.

The 2020/2021Mine Operations Technical Report states the following, a similar statement is included in the GCMP:

For the purposes of 5-year and LOM planning the slope sectors recommended by KP (KP 2010) are being used for all long-term phase and ultimate pit designs. The KP 2010 parameters were adjusted to account for the change to 20m final bench height (2x 10m) by maintaining the same

BFA and IRA angles. These design criteria remain appropriate for design purposes given that the Phase 1, Phase 2 and Phase 3 pit designs are smaller and shallower than both the Payback and Ultimate pits analyzed in KP 2010.

The relevance of this statement to the Phase 2 pit is unclear since the Mine has stated that the Phase 2 pit is using the IRA and BFA developed by Golder (2017) for the Phase 1 Pit. Our understanding is that the 2010 KP design recommendations are being used for the LOM pit. However, for the following reasons a pit based on the 2010 KP design recommendations would not be consistent with the requirements of the MHSR or accepted practice:

- The KP report is feasibility level and not intended for pit construction, the report states: "The pit slope investigations and analyses undertaken at Deposit No. 1 suggest that additional data is required prior to finalizing the pit design and mine extraction sequence."
- The KP report is stated as providing feasibility level design for the proposed 250m deep "Payback pit".
- The KP report is stated as providing design comments only for the proposed 500m (LOM) pit.
- The KP Report is based on geotechnical information collected in 2006 and 2007 which has not been updated.
- The KP analysis was completed using 15m bench height whereas the mine is now using 20m benches. The Mine states that the KP recommendations were adjusted by maintaining the same BFA and IRA angles; however, no documentation is provided to support the equivalency of this adjustment, or confirmation from KP that the adjustments are acceptable and do not alter the findings and use of their report.

The information submitted for the Phase 2 pit is not consistent with the geotechnical requirements of the MHSR clauses 1.03, 1.04 and 1.141 nor accepted practice for mine in NWT/Nunavut. As such approval of the Phase 2 Pit and multi bench mining system by the Chief inspector is not recommended at this time. The following information should be requested from the mine to support the application to WSCC for approval of the Phase 2 pit.

- <u>Updated geotechnical model and verification of design assumptions based on as found conditions and experience.</u>
- Assessment of the proposed bench, inter-ramp, and overall pit slope stability. Confirmation that the pit design will achieve industry accepted FOS, or probability of failure criteria (e.g., Guidelines for Open Pit Slope Design, 2009 Reed and Stacey eds.)
- Assessment of the consequence of pit slope failures.
- Assessment of potential for crest break back due to geologic structure, blasting, scaling, etc., and impact on as built bench width. Confirmation that as constructed bench width is expected to meet industry standards and the MHSR.
- Confirmation that the as-built bench width will contain rock fall to accepted industry standards (e.g., minimum 90% retention).
- Confirmation that the as-built bench width will contain bench scale failure to accepted industry standards (e.g., minimum 75% of volume from conceivable largest single bench scale failure).
- <u>Details of proposed scaling procedures</u> to mitigate rockfall from multiple benches.
- Details of bench cleaning program.

The Ground Control Management Plan (GCMP) is stated to apply to all infrastructure at the Mary River Mine including the pit, waste rock dump, stockpiles, quarries. The GCMP includes the following:

- Purpose/objectives of the plan
- Roles and Responsibilities
- Design and design validation

- Geotechnical Hazard Management
- Inspection Schedules and Reporting
- Training
- Auditing

The GCMP is generally consistent with the requirements of the MHSR and industry practice. The Plan provides specific information and guidance for the pit, but only generic information for other infrastructure such as the waste rock dump and quarries. Examples of pit and waste rock dump inspections have been submitted by the mine that demonstrate routine inspections are being completed and documented for these areas in accordance with t GCMP and requirements of the MHSR.

The GCMP section 5.5.1 states that an external geotechnical review is to be completed annually. During the 2019 WSCC geotechnical inspection WSCC was led to believe that Golder Associates had been to site and that a copy or their External Review report would be submitted to the Chief Inspector. The Mine should be requested to submit a copy of the 2019 3<sup>rd</sup> Party Review Report (and the 2020 if available) to the Chief Inspector.

#### **Waste Rock Storage Facility**

The Mine Operations Technical Summary states that the WRSF is being constructed by loose dumping, individual bench slopes are 1:5H:1V (angle of repose), and overall effective slopes are to be 2H:1V. There is no reference to a specific design for the facility. Based on discussions with Baffinland staff WSCC understood that the WRSF was being constructed in accordance with designs provided by Golder Associates and that Golder Associates completed annual reviews of the facility.

Section 1.149 of the MHSR requires that a dump be designed by a professional engineer if it covers an area greater than 5ha, contains more than one million m³ of material, or is greater than 50m high. The existing WRSF now meets or exceeds these criteria. WSCC has no record of any application or engineering designs being submitted for the dump. As per sections 1.444 and 1.150 of the MHSR, the Mine should make an application to the Chief Inspector for the waste rock storage facility. The extent of the analysis and designs, including minimum acceptable factor of safety, should be commensurate with the consequence classification for the dump, in accordance with accepted practice (e.g., Guidelines for Mine Waste Dump and Stockpile Design, 2017, Hawley M, Cunning J ed.).

Baffinland has implemented a dump inspections and monitoring program consistent with the geotechnical requirements of the MHSR and accepted practice.

#### QMR2 Quarry

No additional information was submitted on the QMR2 for this desktop study.

The Mine submitted designs for the QMR2 quarry in 2016 which used the configuration in the following table:

Quarry	Max. Height	Bench face	Overall angle	Bench width
		angle		
QMR2	50m	65 deg	34 deg	10m

During the 2019 WSCC geotechnical inspection it was observed that the quarry was not fully compliant with the submitted design, the GCMP, the requirements of the MHSR, and generally accepted practices. As per section 1.03 and 1.05 of the MHSR the Mine should submit a revised plan for the QMR2 quarry to the Chief Inspector that is consistent the MHSR sections 1.135 through 1.141 and accepted practice.

#### **Limitations and Closure**

Michael Cullen Geotechnical prepared this report for the use of the WSCC. This report provides comments and opinions only, based on limited observations and review of work completed by others. This report is not to be used for engineering decisions or design. MCG does not accept responsibility for damages suffered by any third-party reliance or use of this report.

A record copy of this document is on file at MCG. That copy takes precedence over any other copy or reproduction of this document.

We trust that this report satisfies your present requirements. Should you have any questions or comments, please do not hesitate to contact us. The opportunity to be of service to you is appreciated.

Sincerely

Michael Cullen Geotechnical per

Michael Cullen, P.Eng.

Baffinland Mine WSCC Geotechnical Review 2020