

APPENDIX E.8.3

WSCC Inspection Reports

Inspection Report

Mining

Report Reference:

Inspection #: 2020-VM-00277

OPERATOR

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

MINE

Mary River Mine Site - Emulsion Plant

MINE MANAGER

Sylvain Proulx

INSPECTOR

Viktor Mubili

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.

Inspection Report

Mining

Report Reference:

Inspection #: 2020-VM-00277

Order Number:	2020-VM-00277-001	Status:	Open
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Required Compliance Date: March 27, 2020

Contractor: DYNOL 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.

Inspection Report

Mining

Report Reference:

Inspection #: 2020-VM-00277

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

Required Compliance Date: March 23, 2020

Contractor: DYN0 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.

Inspection Report

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.

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Inspection Report

Mining

Report Reference:

Inspection #: 2020-VM-00271

OPERATOR

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

MINE

Mary River Mine Site – Milne Explosives

MINE MANAGER

Sylvain Proulx

INSPECTOR

Viktor Mubili

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.

Inspection Report

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 12.11.(b):	The manager shall ensure that suitable warning signs identify all fire hazard areas, including explosives storage areas;
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Section 14.03. The manager shall ensure that "NO SMOKING OR OPEN FLAME" signs are posted 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.

Inspection Report

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.

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Inspection Report

Mining

Report Reference:

Inspection #: 2020-VM-00278

OPERATOR

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

MINE

Mary River Mine Site - Mary River Camp

MINE MANAGER

Sylvain Proulx

INSPECTOR

Viktor Mubili

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.

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.

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Inspection Report

Mining

Report Reference:

Inspection #: 2020-VM-00276

OPERATOR

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

MINE

Mary River Mine Site – Mine Operations

MINE MANAGER

Sylvain Proulx

INSPECTOR

Viktor Mubili

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.

Inspection Report

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.

Inspection Report

Mining

Report Reference:

Inspection #: 2020-VM-00276

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

Inspection Report

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. Except where otherwise required by these regulations, the electrical system and
(2): 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.

Inspection Report

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 reachable.

Legislation: Mine Health & Safety Regulations(Nunavut)

Section 10.42. Every fire suppression system and every fire extinguisher shall be examined once a 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 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

Inspection Report

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.

Inspection Report

Mining

Report Reference:

Inspection #: 2020-VM-00276

Regulatory Requirements

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Inspection Report

Mining

Report Reference:

Inspection #: 2020-VM-02368

OPERATOR

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

MINE

Mary River Mine Site – 620 Bench Highwall

MINE MANAGER

Sylvain Proulx

INSPECTOR

Viktor Mubili

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.

Inspection Report

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.

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Inspection Report

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.

Inspection Report

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.

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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 3rd 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 and 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 2020/2021 Mine 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.

- Updated geotechnical model and verification of design assumptions based on as found conditions and experience.
- 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).
- Details of proposed scaling procedures 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 the 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 of their External Review report would be submitted to the Chief Inspector. The Mine should be requested to submit a copy of the 2019 3rd 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, Cunniff 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 angle	Overall angle	Bench width
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.

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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.