Water Resources Division
Resource Management Directorate
Nunavut Regional Office
P.O. Box 100
Iqaluit, NU, X0A 0H0

Your file - Votre référence
2AM-MRY1325
Our file - Notre référence
GCDocs# 99896042

December 30, 2021

Richard Dwyer
Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU, X0B 1J0
E-mail: licensing@nwb-oen.ca

Re: Crown-Indigenous Relations and Northern Affairs Canada's (CIRNAC) Reclamation Cost Estimate in support of the Annual Security Review for Baffinland Iron Mines Corporation's Updated 2022 Work Plan for the Mary River Project, Water Licence 2AM-MRY1325 Amendment No. 1

Mr. Dwyer,

Thank you for the invitation to participate in the 2022 Annual Security Review (ASR) concerning the Mary River Project, operated by Baffinland Iron Mines Corporation (BIMC). Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) examined BIMC's 2022 Work Plan submission and updates to the reclamation security estimates for the Mary River Project, pursuant to CIRNAC's responsibilities under Part C and Schedule C of the Water Licence 2AM-MRY1325 – Amendment No. 1.

Estimate for the 2022 Work Plan

CIRNAC retained the support of SNC-Lavalin Group Inc. to develop a reclamation cost estimate for the Mary River Project using the RECLAIM 7.0 model. This estimate is intended to incorporate the scope of BIMC's 2022 Work Plan and is provided as a separate document in Annex A of this submission. This submission includes a reconciled 2021 global cost estimate and a 2022 marginal cost estimate. The 2022 global estimate was derived from these models.

Documents and files provided by BIMC considered in this review include:

- Updated 2022 Work Plan, dated November 1, 2021, which includes:
  - Appendix A: 2022 Work Plan Site Layouts
  - Appendix B: 2022 Marginal Closure And Reclamation Financial Security Estimate

- Appendix C: Interim Closure And Reclamation Plan
- Appendix D: Emergency Response Plan
- Appendix E: Spill Contingency Plan
- Appendix F: 2021 Work Plan Addendum

Phase 2 Items

The marginal estimate includes items of the work plan that are approved under the current project.

CIRNAC's marginal estimate includes items from BIMC's 2022 work plan that have been approved by the Nunavut Water Board (NWB) under the current Type A water licence. Since 2019, BIMC has been storing modules intended for Phase 2 of the project, which is currently not approved, on Inuit Owned Land with permission from the Qikiqtani Inuit Association (QIA). These modules include:

- Crushing Module;
- Rail Construction Materials;
- Car Dumper Module;
- BMH Conveyors; and
- Screening Module.

BIMC intended to mobilize another module, the Shiploader module, to site in 2021 and included this cost in the 2021 Work Plan and EBS estimate. This module has not yet been mobilized to site and therefore was not included in the 2022 Work Plan, so BIMC and CIRNAC removed this cost from the 2021 Reconciled estimates. The costs associated with demobilization of the modules have been included in CIRNAC's estimate; the costs for decommissioning these modules have been included in a separate estimate for Phase 2 under the Phase 2 licence amendment process.

CIRNAC reiterates that the modules are not to be commissioned unless, or until, the Phase 2 amendment application is approved by the NWB and the Minister of Northern Affairs. CIRNAC further stresses that although it has included costs for items planned in 2022 that require modification to the licence, approvals must be granted by the NWB prior to initiating the work.

2021 Work Plan Addendum

CIRNAC's 2022 global estimate based on BIMC's submitted 2022 Work Plan is $106,471,393. Of that estimate, $ 2,784,218 is allocated to Crown Liability. This represents a reduction of $3,782 for the Crown. The reduction is mostly due to the removal of the following activities from the 2021 Work Plan, provided as Appendix F:

1. Deferment of the mobilization of the shiploader 'Module';
2. Deferment of the development of quarries and laydowns within the Tote Road corridor;
3. Revisions to equipment and materials to arrive on the 2021 sealift; and
4. Backhaul of contractor equipment and materials during the 2021 sealift.

Table 1: CIRNAC 2022 Global Estimate Cost Breakdown

	Security Currently Posted under 2AM-MRY1325	2021 Reconciled Global Estimate	2022 Work Plan Marginal Estimate	2022 Global Estimate
Total Cost	$123,787,500	$104,678,386	$1,793,006	$106,471,393
IOL Liability	$120,999,500	$101,894,168	$1,793,006	$103,687,175
Crown Liability	$2,788,000	$2,784,218	$0	$2,784,218

Cost Breakdown

CIRNAC's global reclamation cost estimate for the 2021 Work Plan is $106,471,393. This review considers the 'global' security which includes the financial liabilities for both land and fresh water for undertakings and related activities covered under the existing water licence 2AM-MRY1325. The difference between what the Minister currently holds and what CIRNAC estimates the Minister should hold constitutes a reduction of $3,782.

Interim Closure and Reclamation Plan and Unit Rates

CIRNAC's estimate was calculated based on the current Interim Closure and Reclamation Plan (ICRP) timelines and strategies, and is based on the 2020 Arbitration Unit Rates, as CIRNAC agreed to during the 2021 ASR Teleconference. CIRNAC restates that it is of the opinion that the ICRP requires an update, which should include specific strategies to close the waste rock pile, timelines for water treatment, post closure, and an increase of duration for Interim Care and Maintenance and Post-Closure Monitoring to 5 and 25 years, respectively. More recommendations for changes to the ICRP can be found in the attached SNC-Lavalin Group Inc. report under Section 5.1. Although CIRNAC's 2022 global estimate represents an overall reduction, we believe that the changes we request to the ICRP would increase overall closure costs.

Although our estimate represents a reduction, we believe the project is under-secured due to uncertainties such as: unidentified source of acid rock drainage and the uncertain approach to its mitigation, out of date ICRP and lack of clarity on water treatment needs.

Recommendations

1. **Reclamation Security Costs**

Currently, based on a review of the substantive materials provided by BIMC, CIRNAC's calculation of the global total of security in an amount of $106,471,393 would ensure that the project is secured for the peak projected reclamation costs for 2022.

This represents a reduction of $19,770,894 of the global estimate in the amount required to adequately secure the activities proposed under the 2022 Work Plan. As well this represents a reduction in the amount of security CIRNAC currently holds by $3,782.00; from $2,788,000 to $2,784,218. CIRNAC recommends, based on the information it has received to date and current closure strategies, that this reduction in security would still ensure that the amount held by the Minister will be sufficient to cover the Crown's portion of reclamation security for 2022.

2. **Project Modification Approvals**

CIRNAC recommends that BIMC not engage in any work that is secured under the 2022 Work Plan, which may require a modification or an amendment to the licence without first obtaining appropriate approvals from the NWB.

3. **Information Requests**

To assist in refining the security estimates for future iterations of the ASR, CIRNAC recommends that BIMC clarify the discrepancies/ issues, as outlined in the SNC-Lavalin Group Inc. Report in Annex A: The outstanding clarifications requested in Table 5-5: Summary of Findings.

If there are any questions or concerns, please contact me at (867) 975-4282 or lauren.perrin@rcaanc-cirnac.gc.ca or Andrew Keim, A/Manager of Water Resources, at (867) 975-4550 or andrew.keim@rcaanc-cirnac.gc.ca.

Sincerely,

Lauren Perrin,
Water Management Specialist

CC:

Assol Kubeisinova, Technical Advisor, Nunavut Water Board
Lou Kamermans, Senior Director - Sustainable Development, Baffinland Iron Mines Corporation
Jared Ottenhof, Director Major Projects, Qikiqtani Inuit Association

Annex A

2022 Reclamation Cost Estimate for the Mary River Project
Water licence 2AM-MRY1325 - Amendment #1
prepared by SNC-Lavalin Inc.

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Mary River Project
FINAL Rev. 01
2021-2022 Annual Security Review Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)

December 22, 2021 Our file: 686456

List of Revisions

Revision				Revised pages	Remarks
#	Prep.	Rev..	Date		
00	Jonathan Croston Matt Anderson Cameron Bates	Jonathan Cooper Karola Toth	2021-12-16		Final
01	Jonathan Croston Cameron Bates	Karola Toth	2021-12-22		Final Rev. 01

Notice to Reader

This report has been prepared and the work referred to in this report has been undertaken by the Environment & Geoscience business unit of SNC-Lavalin Inc. (SNC-Lavalin) for the exclusive use of Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) (the Client), who has been party to the development of the scope of work and understands its limitations. The methodology, findings, conclusions, and recommendations in this report are based solely upon the scope of work and subject to the time and budgetary considerations described in the proposal and/or contract pursuant to which this report was issued. Any use, reliance on, or decision made by a third party based on this report is the sole responsibility of such third party. SNC-Lavalin accepts no liability or responsibility for any damages that may be suffered or incurred by any third party as a result of the use of, reliance on, or any decision made based on this report.

SNC-Lavalin has, in preparing estimates, as the case may be, followed accepted methodology and procedures, and exercised due care consistent with the intended level of accuracy, using its professional judgment and reasonable care, and is thus of the opinion that there is a high probability that actual values will be consistent with the estimate(s). Unless expressly stated otherwise, assumptions, data and information supplied by, or gathered from other sources (including the Client, other consultants, testing laboratories and equipment suppliers, etc.) upon which SNC-Lavalin's opinion as set out herein are based have not been verified by SNC-Lavalin; SNC-Lavalin makes no representation as to its accuracy and disclaims all liability with respect thereto.

The findings, conclusions, and recommendations in this report (i) have been developed in a manner consistent with the level of skill normally exercised by professionals currently practicing under similar conditions in the area, and (ii) reflect SNC-Lavalin's best judgment based on information available at the time of preparation of this report. No other warranties, either expressed or implied, are made as to the professional services provided under the terms of our original contract and included in this report. The findings and conclusions contained in this report are valid only as of the date of this report and may be based, in part, upon information provided by others. If any of the information is inaccurate, new information is discovered, site conditions change, or applicable standards are amended, modifications to this report may be necessary. The results of this assessment should in no way be construed as a warranty that the subject site is in compliance with regulatory requirements.

This report must be read as a whole, as sections taken out of context may be misleading. If discrepancies occur between the preliminary (draft) and final versions of this report, it is the final version that takes precedence. Nothing in this report is intended to constitute or provide a legal opinion.

The contents of this report are confidential and proprietary. Other than by the Client, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of the Client and SNC-Lavalin.

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Appendices

1. Introduction

SNC-Lavalin Inc. (SNC-Lavalin) has been retained by Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) to participate in the 2022 Annual Security Review (ASR) process for the Type A Water Licence No. 2AM-MRY1325 for the Mary River Mine.

This report provides a summary of updated financial security cost estimates using RECLAIM version 7 that incorporate information from the Baffinland Iron Mines Corporation (BIMC) 2022 Work Plan, issued by Baffinland Iron Mines Corporation on November 1, 2021.

1.1. Background

The Mary River Project (Project) is located in Nunavut, on the northern end of Baffin Island, 160 km south of Pond Inlet. This project is an iron ore mine owned and managed by BIMC. It has been in production since fall 2014, hauling ore from the mine site along the Tote Road to Milne Port, where the first ore shipments were made in summer 2015. BIMC is operating under a Nunavut Impact Review Board project certificate and Nunavut Water Board (NWB) Type A water licence 2AM-MRY1325 amendment #1.

In 2018, BIMC submitted to the Nunavut Planning Commission (NPC) and the Nunavut Impact Review Board (NIRB), the Final Environmental Impact Statement (FEIS) and the Addendum to the FEIS Mary River Project - Phase 2 Development Proposal. CIRNAC's Mine Site Reclamation Policy for Nunavut (CIRNAC, 2002) requires that financial security be held for the highest reclamation liability for land and water combined for a mine project. This policy details the assumptions required for determining the security amount.

The financial security estimations for the Mary River Project site development and related activities have been completed by BIMC, the Qikiqtani Inuit Associations (QIA), Arktis Solutions, third party contractor from QIA, and a third-party contractor hired by CIRNAC. Financial security is held under the above water licence by CIRNAC or the QIA depending on the land ownership where infrastructure and activities are located.

In 2015, CIRNAC retained a third-party contractor to complete an independent evaluation of the reclamation liabilities associated with the Mary River Project to ensure that the requirements of the 2002 Policy were met. The reclamation estimations, prepared for CIRNAC, were made using the RECLAIM v. 7 Model. The estimate has consecutively been updated annually since 2016.

On August 10, 2020, BIMC and QIA concluded the Reclamation Security Arbitration Agreement Final Award, regarding the 2019 Work Plan and associated estimate including nine (9) items of high uncertainty, where parties differed in position or methodology. The present Global Reclamation Security considers the outcome of the 2020 Post Arbitration - 2019 Work Plan Reconciliation (2020 Arbitration).

1.2. Objective and Scope of Work

The objective of the mine reclamation cost estimate update, based on the Request for Proposal, was to complete a re-evaluation of the reclamation liabilities associated with the Mary River Project using the

CIRNAC RECLAIM v. 7 model reflecting the current state of project development and considering BIMC's proposed 2022 Work Plan. The intent is to:

- Calculate the total financial security for final reclamation required during the 2021 - 2022 fiscal years. It is equal to the total outstanding reclamation liability for land and water combined and calculated based on the cost of having the necessary reclamation work done by a third-party contractor if the operator defaults. The estimates also include contingency factors appropriate to the particular work to be undertaken; and
- Assist the Department in its participation in the Nunavut Water Board's Annual Security Review (ASR) process for the Type A Water Licence 2AM-MRY1325.

As per CIRNAC's Statement of Work dated September 17, 2021 the scope of work of this desktop study included the following activities, and discussions during the project kick-off meeting on November 1, 2021:

- Update the current Mine Reclamation Cost Estimate of the Mary River Project using the RECLAIM model version 7;
- Perform a desktop Review of BIMC's 2022 Work Plan including its mine reclamation cost estimate;
- Determine whether the 2022 cost estimate is enough to ensure appropriate closure and restoration of the site and implementation of any required ongoing measures after site restoration including post-abandonment interim care cost for 3 years as per the approved ICRP (2018);
- Include post-closure monitoring costs for 15 years as per the approved ICRP (2018);
- Review BIMCs 2018 Interim Closure and Reclamation Plan to ensure its contents and requirements are adequately represented in the Reclaim model and security estimate, and ensure that RECLAIM accurately reflects existing operations;
- Include an environmental contingency for potential future liabilities related to remediation costs; and
- Provide Support to CIRNAC during the ASR Regulatory Proceedings of the NWB.

The following activities are excluded from the Scope of work:

- Site survey, Site audits, field investigation, sample collection or laboratory work;
- Material take-offs;
- Review of Environmental Management Plans;
- Development of new Unit rates or detailed review of unit rates proposed by Baffinland; and
- Costs associated with the dock facilities at the Milne Port.

2. Methodology

2.1. Data Review

To conduct the Annual Security Review (ASR) process, SNC-Lavalin relied on the following documentation:

- 2022 Work Plan, Addendum and associated Estimate Breakdown Structure (EBS) workbook, dated November 1, 2021 by BIMC for 2022 Security Estimate. Link: ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-MRY1325%20BIMC/3%20TECH/2%20SECURITY%20(C)/2022/.
- Interim Closure and Reclamation Plan (ICRP) (BAF-PH1-830-P16-0012), Revised Draft – Rev 5, Baffinland Iron Mine Corporation, dated October 30, 2018: ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-MRY1325%20BIMC/3%20TECH/2%20SECURITY%20(C)/2021/201106%202AM-MRY1335%20AppC%20Interim%20Closure%20and%20Reclamation%20Plan-ILAE.pdf.
- Submissions and correspondence for the Annual Security Review in 2020-2021: ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-MRY1325%20BIMC/3%20TECH/2%20SECURITY%20(C)/2021/.
- The 2021 Security Estimate and associated RECLAIM Ver7 workbook by CIRNAC for 2021 Security Estimate.
- Construction plans for infrastructure on site: ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-MRY1325%20BIMC/3%20TECH/5%20CONSTRUCTION%20(D)/.
- Baffinland internal Geotechnical Inspection Report No. 1, as submitted on August 23, 2021, from the following folder on the NWB ftp site:: ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-MRY1325%20BIMC/3%20TECH/5%20CONSTRUCTION%20(D)/.
- Baffinland Iron Mines Corporation, Phase 1 Waste Rock Management Plan, Rev3, dated June 16, 2020. ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-MRY1325%20BIMC/3%20TECH/4%20WASTE%20DISP%20(F)/F%203%20Waste%20Rock%20Mgmt%20Plan/200616%202AM-MRY1325%20Baffinland%20Submission%20of%20Revised%20Phase%201%20WRMP-ILAE.pdf.
- Baffinland Iron Mines Corporation, Surface Water and Aquatic Ecosystem Management Plan, Rev 7, dated March 31, 2021. https://www.baffinland.com/_resources/document_portal/Surface-Water-and-Aquatic-Ecosystems-Management-Plan-Rev-7.pdf.
- Inspection Reports from CIRNAC Field Operations: ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-MRY1325%20BIMC/3%20TECH/0%20SCOPE%20ENFORCE%20(A)/1%20INSPECTION/.

- 2018 Marginal Closure and Reclamation Financial Security Estimate, dated November 16, 2017 by BIMC for 2018 Security Estimate. ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-MRY1325%20BIMC/3%20TECH/2%20SECURITY%20(C)/2017/171122%202AM-MRY1325%202018%20Marginal%20Closure%20Cost%20Report-ILAE.pdf.
- Modification Requests for Water Licence 2AM-MRY1325 – Amend. No. 1,: ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-MRY1325%20BIMC/3%20TECH/6%20MODIFICATIONS%20(G)/.
- CIRNAC's Mine Site Reclamation Policy for Nunavut (CIRNAC, 2002): https://www.rcaanc-cirnac.gc.ca/DAM/DAM-CIRNAC-RCAANC/DAM-NTHAFF/STAGING/texte-text/recpolnuna_1100100036043_eng.pdf.

2.2. Update of the Reclaim (v 7) Model

SNC-Lavalin's 2022 ASR estimate builds on the previous reviews carried out for the Mary River Project on behalf of CIRNAC.

For the 2022 ASR, we have updated the RECLAIM mine reclamation cost estimate of the Mary River Project. Our security estimation integrates information from a review of BIMC's 2022 Work Plan dated November 1, 2021.

Two RECLAIM models have been prepared:

- ***Global RECLAIM (Reconciled 2021 RECLAIM Global Estimate)*** – comprising the 2020 Reconciled Global RECLAIM Estimate (prepared in 2020) combined with the 2021 Marginal Estimate (prepared in 2020). This model has been adjusted with any 2021 reconciled items (identified by BIMC in their 2022 Marginal Closure and Reclamation Financial Security Estimate). This model represents the latest closure estimate as of this year (2021) and does not include any 2022 items.
- ***Marginal RECLAIM (2022 RECLAIM Marginal Estimate)*** – This is the security estimate based on BIMC 2022 Work Plan and represents the security estimate based on BIMC's anticipated 2022 activities only.

The **2022 Global Estimate is the combined cost of these two models** (as outlined in Section 4.4). The SNC-Lavalin Reconciled 2021 RECLAIM Global Estimate and 2022 Marginal Estimate is presented respectively in Appendix A and Appendix B of this report.

The quantities stated by Baffinland for the 2022 activities, have been accepted by SNC-Lavalin in this review as a complete field audit was not included in SNC-Lavalin scope of work. We did a cross-check of the equipment list provided by Baffinland in the 2022 Work Plan, the 2022 EBS and the RECLAIM models.

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3. Overview of BIMC 2022 Marginal, Closure and Reclamation Financial Security Estimate

The 2022 Marginal Closure and Reclamation Financial Security Estimate prepared by BIMC on November 1, 2021 is included in Appendix B of the BIMC 2022 Work Plan of Mary River Project. The estimate provides a summary of the closure and reclamation security estimated to be required for the Mary River Project to meet reclamation objectives as outlined in the approved Interim Mine Closure and Reclamation Plan Rev.5, dated October 30, 2018 (presented in Appendix C of the 2022 Work Plan).

The total Global closure and reclamation security estimate takes into consideration planned work in 2022 to be conducted under Type "A" Water Licence 2AM-MRY1325, Amendment No. 1 in addition to previous project closure and reclamation security estimates.

The following sections present a summary review of the information, assumptions and costs estimate included in the BIMC 2022 Marginal Closure and Reclamation Financial Security Estimate, November 1, 2021.

3.1. BIMC Security Estimate Development

The 2022 Marginal Closure and Reclamation Financial Security Estimate (dated November 01, 2021) represents BIMC's proposed annual adjustment to reclamation security for 2022. The approach for developing the estimate follows the same logic as previous years. It is BIMC's position that the aggregate of the 2022 Marginal Closure and Reclamation Financial Security Estimate and the previous 2021 Project closure and reclamation security represent the total global closure and reclamation costs required. The estimate assumes a third-party contractor will perform the work in a worst-case scenario to meet reclamation objectives as outlined in the Interim Mine Closure and Reclamation Plan (BAF-PH1-830-P16-0012). The estimate is intended to address all disturbed areas, project components and project activities existing on the Mary River Project site upon conclusion of the 2022 Work Plan.

The BIMC security cost estimates were all developed by BIMC employing Hatch's Estimate Breakdown Structure (EBS) approach. The EBS approach and the unit costs developed are described in 2014 Complete Project Financial Security Assessment Report (H349000-1000-07-126-0018, Rev. 1, October 31, 2014). BIMC updated the unit costs according to the Arbitration Outcome Reconciliation in 2020. Based on the outcome of this Arbitration, BIMC carried forward the updated unit rates to the 2021 and 2022 Work Plans and Estimates.

The amount of security estimated to be required is based on an estimate of the highest reclamation liability in the upcoming year or "worse case" scenario. The Grand totals are rounded to the nearest '000.

The 2022 Estimate was developed by applying the direct cost unit rates to quantities of functional units of each activity or project component proposed/changed under the 2022 Estimate, unless indicated otherwise by BIMC.

3.2. BIMC 2022 Annual Security Review Reconciliation

For the 2022 Estimate to reflect the total global closure and reclamation security, the previous years' project estimates have been reconciled. Activities previously proposed that required reconciliation fall into the following categories:

- Revisions to the Global Estimate relative to the 2021 Work Plan;
- Activities that have had security allocated to them that are no longer planned to be conducted;
- Activities that have been conducted but have no security explicitly allocated to them; and
- Materials and equipment that have arrived at the Project on the 2021 sealift and were under or overestimated in 2021 or were backhauled from the project on the 2021 sealift.

3.2.1. 2021 Work Plan Reconciliation

For the 2022 Estimate to accurately reflect the total 'global' closure and reclamation security estimated to be required for the Project in 2022, the complete scope of work for 2021 was reconciled and a revised Global Estimate and Addendum relative to the 2021 Work Plan was established. These outcomes are addressed in the 2021 Work Plan Addendum and Appendix B of that document.

The total Global value of reclamation security for the 2021 Work Plan adjusted with reconciliation is **$105,556,595.** The review performed by SNC-Lavalin is presented in the following sections of this report.

3.2.2. 2021 Work Plan Addendum

The purpose of the 2021 Work Plan Addendum (2021 Addendum) is to update and revise plans for the 2021 year, including backhaul of equipment by sealift, due to delays in the Phase 2 Proposal regulatory process. Several works identified in the 2021 Work Plan and prior years have been deferred indefinitely or removed from the current scope of the project. These include:

- Deferment of the mobilization of the 'Shiploader Module';
- Deferment of the development of quarries and laydowns within the Tote Road corridor;
- Revisions to equipment and materials to arrive on the 2021 sealift; and
- Backhaul of contractor equipment and materials during the 2021 sealift.

A summary of reconciliation to the 2021 Estimate as presented in the BIMC 2021 Addendum and 2022 EBS is presented below.

- **Mechanical and Mobile Equipment:** The position presented by Baffinland during previous security estimates was based on the forecasted equipment expected to be delivered to site in 2021. The variation of the actual type and quantity of equipment delivered to site in 2021 is presented in section 8.2 of the BIMC Report and adds to a difference of 26 pieces of equipment with a cost of -**$39,000**. A negative value is the result of less equipment arriving to the site than what was forecasted for 2021. In addition, 3rd Party Equipment was reconciled from the value presented in the 2021 ASR and is considered an indirect cost using 2020 Arbitration rates, representing 180 pieces of equipment with a cost of -**$1,455,000**. BIMC listed costs for 3rd Party Equipment

mobilization as indirect costs within the 2021 Addendum and 2022 BIMC EBS. This is consistent with last year's estimate and the 2020 Arbitration outcome. The pieces of equipment were considered in the Reclaim model with the SNCL unit rates as per Section 4.4 of this report.

- **Grade and Re-Contour:** Proposed development of four new quarries and five laydown areas along the Tote Road was deferred along with reducing the working limits of the existing quarry Q1 to within the existing PDA boundary. In total the deferred development represents a total reduction in the value for grade and contour of -2,710,893 m^2 and -$4,053,000.
- **Fill Application:** The reduction of fill application as per the 2021 Addendum is -224 m^2, representing -$9,000 spread across the three site areas.
- **Delivery of Fuel:** The revised anticipated fuel delivery represents a reduction of value totalling -$320,000.
- **Demobilization of Phase 2 Modules (Shiploader Module):** BIMC included a cost reduction for the deferred mobilization of the Shiploader Module. This represents a reduction of value totalling -$8,385,828.
- **Inflation:** It is noted that BIMC includes inflation at approximately 2.9% applied to both indirect and direct costs.

The 2021 Addendum allocated a reduction to other indirect costs including Mobilization of workers required for reclamation, worker accommodation and camp operation, engineering fees, project management, and contingency. These reductions are summarized in Table A below.

Table A: Reconciliation of 2021 Work Plan Estimate (as presented by BIMC)

Activity (on IOL)	Cost ($) difference
Direct Cost sub-total	**-4,100,778**
Indirect Cost	
3rd Party Equipment (as Indirect Cost)	-1,455,000
Fuel	-320,000
Mobilization of Workers required for Reclamation	-286,000
Worker Accommodation and Camp Operation	-784,000
Demobilization of Phase 2 Modules (Shiploader Module)	-8,385,828
Mobilization and Demobilization of Equipment and Materials (10% of direct costs)	-410,000
Supervision, Project Management and Contract Administration (9.4% of direct costs)	-385,000
Engineering Fees (3.9% of direct costs)	-160,000
Contingency (20% of direct costs)	-820,000
Indirect Costs Sub-total	**-13,005,828**
TOTAL (rounded)	**-17,107,000**
Inflation	-488,771
TOTAL COSTS	**-17,595,771**

3.3. 2022 Work Plan

A detailed description of the work activities captured in the BIMC 2022 Work Plan Security Estimate are described in the BIMC 2022 Work Plan assuming that all planned activities for 2021 have taken place on site and all material/consumables (excluding fuel) at site are in full inventory. All other assumptions related to direct or indirect costs are consistent with the assumptions established in the 2014 Complete Project Financial Security Assessment and previous ASR documentation unless noted otherwise. The planned activities for 2022 are summarized below.

Direct Costs Assumptions

- **Buildings and Foundations:** The position presented by BIMC in the 2022 Work Plan accounts for **$161,000** of buildings and foundations plus proportional cover material application costs.
- **Mechanical and Mobile Equipment:** The 2022 Work Plan allocates **$135,000** to account for mobile equipment. This cost allocation is based on a sum of 100 additional pieces of Baffinland owned mechanical or mobile equipment to be mobilized to site in 2022.
- **Site Works:** The 2022 Work Plan allocates **$619,000** for a marginal increase of disturbed areas totalling 338,196 m^2 that would have to be graded and re-contoured. A full reconciled summation of disturbed area based on site mapping is expected from BIMC, but was not available as of reporting date.
- **Cabling:** The 2022 Work Plan allocates **$45,000** to install 2,100 m of cabling at the Mine Site and Milne Port areas.
- **Fill Application:** The 2022 Work Plan allocates an additional **$28,000** to apply cover material due to the marginal increase of demolition materials to be disposed on-site.

Indirect Costs Assumptions

The following activities have been included in the 2022 Marginal Closure and Reclamation Financial Security Estimate. The document presents cost details in Section 4.3.2 and Appendix C.

- **On-Site Fuel Demobilization and Reclamation Fuel Mobilization:** The 2022 Estimate allocates of **$62,000** of additional demobilization of fuel stored on Site, assuming that the tanks will be full at closure.
- **Mobilization of Workers Required for Reclamation**: The 2022 Estimate allocates an additional **$64,000** for worker mobilization.
- **Worker Accommodation & Camp Operation**: The 2022 Estimate allocates an additional **$176,000** for worker accommodation and camp operation during marginal reclamation activities.
- **Mobilization and Demobilisation of Equipment and Materials**: The 2022 Estimate allocates an additional **$99,000** to account for mobilization and demobilization of equipment and materials.
- **Demobilization of 3rd Party Equipment**: The 2022 Estimate allocates **$0** to for additional demobilization of 3rd Party Equipment from the Site.
- **Supervision, Project Management and Contract Administration**: The 2022 Estimate includes a project supervision, management and contract administration indirect cost allowance of **$94,000** or 9.4% of total direct costs, contaminated soil treatment costs and care and maintenance costs, and closure monitoring/reporting costs (the rate is the same used the previous year).

- **Engineering Fees**: The 2022 Estimate includes an engineering, design and execution planning indirect cost allowance of **$39,000** or 3.9% of the total direct costs (the rate is the same used the previous year).
- **Contingency**: The 2022 Estimate includes an additional contingency of **$200,000** or 20% of the total of direct costs, contaminated soil treatment costs, care and maintenance costs and closure monitoring/reporting costs (the rate is the same used the previous year).
- **Inflation**: As a result of the 2020 Arbitration, Baffinland is directed to apply inflation in years when unit rate costs have not been updated. In order to calculate the rate of inflation to be applied in a given year, Baffinland utilizes the Consumer Price Index (CPI) for Iqaluit (not seasonally adjusted) for the month of September in a given year.

The unit costs applied by BIMC to each item are according to the QIA and Baffinland arbitration and the EBS is consistent with the actual methodology agreed to by both parties.

3.4. Summary of 2022 Marginal Closure and Reclamation Estimate

Table B below shows the consolidation of the marginal closure cost estimates that BIMC presents in the 2022 Work Plan, Sections 3 to 8, and lists the 2022 BIMC EBS.

Table B: Summary of the BIMC 2022 Work Plan Marginal Increases of Items Described in Sections 4.3.1 and 4.3.2 of that Report

Activity	Cost ($)
Direct Cost	
Buildings and Foundations	161,000
Mechanical and Mobile Equipment	135,000
Grade and Re-contour of disturbed areas	619,000
Cabling	45,000
Fill Application	28,000
Total Direct Costs	**988,000**
Indirect Cost	
On-Site Fuel Demobilization and Reclamation Fuel Mobilization	0
Mobilization of Workers Required for Reclamation	64,000
Worker Accommodation & Camp Operation	176,000
Demobilization 3rd Party Equipment	0
Fuel	62,000
Mobilization and Demobilization of Equipment and Materials (10% of total direct costs)	99,000
Post Closure Monitoring	7,307
Contaminated Soil treatment	Excluded
Supervision, Project Management and Contract Administration (9.4% of direct costs)	94,000

Table B (Cont'd): Summary of the BIMC 2022 Work Plan Marginal Increases of Items Described in Sections 4.3.1 and 4.3.2 of that Report

Activity	Cost ($)
Engineering Fees (3.9% of direct costs)	39,000
Contingency (20% of direct costs)	200,000
Total Indirect Costs	**741,307**
Inflation	56,141
Grand total (as presented the work plan)	**1,787,141**

3.4.1. Exclusions

Additional costs have not been included in the 2022 Work Plan Security Estimate on the basis that it is BIMC's position that the 2022 Work Plan activities do not warrant additional cost allocations for the following activities:

- Closure & Post Closure Monitoring – A nominal increase of $7,307 increase to Post Closure Monitoring for water treatment.
- Contaminated Soil Treatment. BIMC considered the allocation was enough in 2021 ASR process.
- Explosives (Ammonium Nitrate). BIMC considered the allocation was enough in 2021 ASR process.
- Off-Site Disposal of Hazardous and Non-Hazardous Waste. BIMC considered the allocation was enough for 2020.

3.5. BIMC 2022 Global Security Estimate

The total posted Global Security Estimate as of January 2021 under the Type A (2AM-MRY1325) Licence is $ 123,152,366.

The Total “Global” Estimated Security for 2022 is valued by BIMC at $104,161,082 including the following: Global Estimate from 2021 with the 2020 Arbitration Outcome and the 2021 Addendum, and the 2022 Marginal Estimate.

The distribution of liabilities by land ownership land use is tabulated in Table C below:

Table C: Summary of Total “Global” estimated Security for 2022

Authorization	Liability	Total “Global” estimated Security for 2022 ($)
Type A2AM-MRY1325	IOL	101,843,216
	Crown	2,317,866
	Water	2,127,917
	Land	102,033,165
Sub-total Type A (IOL + Crown)		**104,161,082**

The Sub-total Type A amount is shown under Column G of Table 9.3 of the 2022 Work Plan.

4. Reclaim Model Results

This section of the report provides an overview of the update of the Reclaim model in consideration of the information presented by BIMC in their 2022 Work plan. As per direction received during the kick-off meeting, the update of the Reclaim mode for the 2021-2022 period, the unit rates within the model will follow those that were established during the 2020 arbitration process.

4.1. Unit Rates

It is understood that the security estimates presented by BIMC are based on unit rates that have been adjusted according to the 2020 arbitration outcome with QIA. As per direction received during the kick-off meeting the 2021-2022 ASR process undertaken by CIRNAC will also align with these unit rates (refer to Table D). As per the request, SNC-Lavalin has reviewed these rates in comparison with other projects in the area where we are familiar with unit rates and a discussion of this is provided in Section 5.

Table D: 2020 Arbitration Outcome Unit Rates

Unit	2020 Arbitration Rate ($/unit)
Fill Application	38.83
Grade & Re-Contour	1.49
Grade & Re-Contour Significant Disturbed Areas	4.12
Culvert Removal	862.50
Liner Removal	2.60
Open Pit Stabilization	5.49
Light Mechanical Equipment	1,583.75
Medium Mechanical Equipment	3,392.50
Heavy Mechanical Equipment	32,950.00
Light Mobile Equipment	729.20
Medium Mobile Equipment	1,162.50
Heavy Mobile Equipment	2,075.00
Light Tanks	1,710.42
Medium Tanks	5,900.00
Light Diesel Tanks	2,950.00
Medium Mobile Diesel Tanks	8,381.30
Medium Diesel Tanks	12,928.50
Large Diesel Tanks	85,157.50
Largest Diesel Tanks	137,277.50
Modular Building Not Contaminated	47.64
Modular Building Contaminated	114.88
Fold Away Building Not Contaminated	33.34
Fold Away Building Contaminated	114.04
Soft Walled Building (tent) Not Contaminated	38.10
Soft Walled Building (tent) Contaminated	128.90
ISO Container	23.80

Table D (Cont'd): 2020 Arbitration Outcome Unit Rates

Unit	2020 Arbitration Rate ($/unit)
Timber Cribbing	16.70
Precast Concrete Foundations	30.86
Slab on Grade	30.00
Bridge Removal	161,904.80
Incinerator	7,925.00
Potable Water	7,925.00
Sewage Treatment Plant	8,775.00
Ship Loader	3,070,200.00
Waste Rock Facility Water Treatment Plan	61,750.00
Reclaim Conveyor	1,066,410.00
Piping	53.13
Cabling	21.25
Miscellaneous Items (Major)	425.00
Removal of Airstrip Lighting	22.64

4.2. Direct Cost Updates

The following sub-sections are divided into the respective work groupings used in the RECLAIM models. The quantities used within the respective worksheets are based on information provided by BIMC and SNC-Lavalin's review of existing information.

Unless otherwise noted in the following sections, the assumptions and conclusions outlined in the BIMC 2022 Work Plan and EBS remain valid for the purposes of this assessment and as such the quantities and activities provided have been used in the revised RECLAIM models.

4.2.1. Building and Equipment

Global RECLAIM

In 2020, BIMC consolidated their list of mobile and mechanical equipment into a new section (Baffinland Owned Equipment). This included equipment mobilized under previous work plans for various locations. The Global Reclaim model was previously adjusted accordingly and a similar grouping was carried out for the 2021-2022 RECLAIM modelling.

Marginal RECLAIM

The Marginal RECLAIM model has also included BIMC Owned Equipment.

4.2.2. Disturbed Areas

Marginal RECLAIM

In 2020, satellite imagery was analysed by BIMC in conjunction with a Geographic Information Systems (GIS) coordinator to determine the extent of disturbed areas. The security was updated to reflect the actual disturbed areas and infrastructure that was previously planned for construction but has yet to be completed. A similar exercise was carried out by BIMC this year, however, due to weather conditions this analysis has been delayed. As a result, the 2021-2022 update of the RECLAIM model still contains those areas that were indicated to be disturbed during the 2020 assessment process.

An update to the Grade and Re-Contour Reconciliation (on IOL) was noted for “Actual Disturbed Area Reconciliation – 2020 Satellite Image”. The disturbed area total increased by $229,143 between the 2021 EBS and 2022 EBS. As such, this amount was added to the RECLAIM model under the 2021-R Work Plan for the Mine Site.

4.3. Indirect Cost

In the RECLAIM model, indirect costs include mobilization and demobilization, contingency, engineering, project management, post-closure monitoring and maintenance, health and safety/QA-QC/engagement costs, and bonding/insurance. BIMC calculates fuel as an indirect cost, but in the RECLAIM model it is considered a direct cost. Furthermore, as stated, the RECLAIM model includes costs for bonding and insurance, which BIMC omits this from their estimates.

4.3.1. Fuel

BIMC listed fuel as an indirect cost in the 2022 Work Plan. In keeping with RECLAIM analysis from previous years, SNC-Lavalin has included the $62,000 fuel line item as a direct cost in the 2022 Marginal RECLAIM model. This has a marginal impact on indirect costs since these are calculated as a percentage of direct costs.

4.3.2. Phase 2 Equipment Modules

BIMC listed various mobilization and demobilization costs related to Phase 2 equipment modules since the 2018 Work Plan. The 2021 Work Plan Addendum included a cost reduction for the deferred mobilization of the Shiploader Module, total of -$8,385,828. Overall, the remaining Phase 2 Modules account for a total of $16,798,750 in the 2022 EBS. These costs are included in the 2021 Reconciled Global RECLAIM model. It is noted that all liability for these items are allocated to IOL.

Further discussion on Phase 2 equipment modules is presented in Section 5.4.

4.3.3. Bonding/Insurance

While bonding and insurance line items do not appear to have been carried by BIMC in their security estimate, SNC-Lavalin will continue to use 2% of direct costs for bonding and insurance fees in the RECLAIM model.

4.3.4. Market Factor Adjustment/Inflation

As per the kick-off meeting discussions, the update of the RECLAIM Model shall follow the 2020 Arbitration outcome and SNC-Lavalin will apply "the consumer price index (CPI) for Iqaluit, NU, with the base year referenced to the date of the last unit rate update (month and year of the relevant Work Plan)." In the RECLAIM model, we used 2.6% inflation rate based on the Iqaluit CPI for September 2022. The RECLAIM calculates inflation as a percentage of direct costs.

4.4. Summary of Costs

The 2022 Marginal Estimate and the updated 2021 Reconciled Estimate are summarized in Table E and Table F, showing a comparison to the BIMC costs. Refer to Appendix A and B for the RECLAIM spreadsheets, presenting the detailed breakdown of closure costs by site components. A summary of the 2022 Marginal Estimate, 2021 Reconciled Estimate and 2022 Global Estimate are shown in the Table G at the end of this section.

Table E: Summary of 2022 Marginal Estimate (RECLAIM)

Cost Item	Security Estimate using SNC-Lavalin Recommended Unit Rates	Security Estimate using BIMC Rates as per 2022 Work Plan Estimate
Direct Costs		
Open pit	$0	See 2022 EBS for cost breakdown by activity.
Quarries	$0	
Underground Mine		
Tailings Facility		
Rock Pile		
Buildings and Equipment	$987,093	
Mine Site	$839,149	
Milne Port	$21,076	
Tote Road	$9,397	
Baffinland Owned Equipment	$117,471	
Chemicals and Contaminated Soil Management	$62,000	
Surface and Groundwater Management		
Interim Care and Maintenance		
Subtotal Direct Costs	**$1,049,093**	**$987,239**

Table E (Cont'd): Summary of 2022 Marginal Estimate (RECLAIM)

Cost Item	Security Estimate using SNC-Lavalin Recommended Unit Rates	Security Estimate using BIMC Rates as per 2022 Work Plan Estimate
Indirect Costs		
Mobilization/Demobilization	$339,000	See Table 9.2 for cost breakdown by activity.
Post-Closure Monitoring and Maintenance	$7,307	
Engineering (3.9%)	$40,915	
Project Management (9.4%)	$98,615	
Health and Safety Plans/Monitoring, QA/QC and Engagement Costs (0%)		
Bonding/Insurance (2%)	$20,982	
Contingency (20%)	$209,819	
Market Price Factor Adjustment (2.6%)	$27,276	
Subtotal Indirect Costs	**$743,913**	**$797,448**
GRAND TOTAL	$1,793,006	$1,787,141

Table F: Summary of 2021 Reconciled Estimate (RECLAIM)

Cost Item	Security Estimate using SNC-Lavalin Recommended Unit Rates	Security Estimate using BIMC Rates as per 2022 and 2021 Work Plan Estimate and 2021 Addendum
Direct Costs		
Open pit	$5,926,125	Total Based on Global Estimate Security for 2021 (as presented in the BIMC 2022 Work Plan) plus total reductions from Tranche 1 and Tranche 2 of the 2021 Work Plan Addendum.
Mary River Mine Pit/ Quarries	$5,926,125	
Underground Mine	$0	
Tailings Facility	$0	
Rock Pile	$588,550	
Buildings and Equipment	$23,160,418	
Mine Site	$10,076,701	
Milne Port	$9,615,958	
Tote Road	($2,107,197)	
Project Wide	$724,684	
BIMC Owned Equipment	$4,850,271	
Chemicals and Contaminated Soil Management	$6,806,196	

Table F (Cont'd): Summary of 2021 Reconciled Estimate (RECLAIM)

Cost Item	Security Estimate using SNC-Lavalin Recommended Unit Rates	Security Estimate using BIMC Rates as per 2022 and 2021 Work Plan Estimate and 2021 Addendum
Surface and Groundwater Management	$1,247,071	
Interim Care and Maintenance	$3,423,145	
Subtotal Direct Costs	**$41,151,505**	
Indirect Costs		
Mobilization/Demobilization	$43,502,261	
Post-Closure Monitoring and Maintenance	$4,428,200	
Engineering (3.9%)	$1,604,909	
Project Management (9.4%)	$3,868,241	
Health and Safety Plans/Monitoring, QA/QC and Engagement Costs (0%)	$0	
Bonding/Insurance (2%)	$823,030	
Contingency (20%)	$8,230,301	
Market Price Factor Adjustment (2.6%)	$1,069,939	
Subtotal Indirect Costs	**$63,526,882**	
GRAND TOTAL	**$104,678,386**	**$105,556,595**

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Table G: Summary of 2022 Global Estimate (RECLAIM) and Comparison to BIMC 2022 Security Estimate

			2021 Reconciled Global Estimate			2022 Marginal Estima	
			Total	IOL Liability	Crown Liability	Total	IOL Liability
CAPITAL COSTS							
OPEN PIT	Mary River Mine Pit		$5,926,125	$5,926,125	$0	$0	$0
BUILDINGS AND EQUIPMENT	Mine Waste Rock Pile		$588,550	$588,550	$0	$0	$0
	Mine Site		$10,076,701	$10,076,701	$0	$839,149	$839,149
	Milne Port		$9,615,958	$9,982,428	-$366,470	$21,076	$21,076
	Tote Road		-$2,107,197	-$3,458,212	$1,351,015	$9,397	$9,397
	Project Wide		$724,684	$528,632	$196,053	$0	$0
	BIMC Owned		$4,850,271	$4,850,271	$0	$117,471	$117,471
CHEMICALS ANC CONTAMINATED SOIL MANAGEMENT			$6,806,196	$6,650,904	$155,291	$62,000	$62,000
SURFACE AND GROUND WATER MANAGEMENT			$1,247,071	$1,218,301	$28,770	$0	$0
INTERIM CARE AND MAINTENANCE			$3,423,145	$3,344,171	$78,973	$0	$0
		SUB-TOTAL	**$41,151,505**	**$39,707,872**	**$1,443,633**	**$1,049,093**	**$1,049,093**
		PERCENT OF SUB-TOTAL		97.13%	2.87%		100%
INDIRECT COSTS							
MOBILIZATION/DEMOBILIZATION			$43,502,261	$42,736,163	$766,098	$339,000	$339,000
POST-CLOSURE MONITORING AND MAINTENANCE			$4,428,200	$4,301,159	$127,041	$7,307	$7,307
ENGINEERING		3.90%	$1,604,909	$1,558,865	$46,043	$40,915	$40,915
PROJECT MANAGEMENT		9.40%	$3,868,241	$3,757,265	$110,976	$98,615	$98,615
BONDING/INSURANCE		2%	$823,030	$799,418	$23,612	$20,982	$20,982
CONTINGENCY		20%	$8,230,301	$7,994,181	$236,119	$209,819	$209,819
INFLATION		2.6%	$1,069,939	$1,039,243	$30,696	$27,276	$27,276
SUBTOTAL			**$63,526,882**	**$62,186,296**	**$1,340,585**	**$743,913**	**$743,913**
TOTAL COST (direct and indirect)			**$104,678,386**	**$101,894,168**	**$2,784,218**	**$1,793,006**	**$1,793,006**
Total estimated Security for 2022 as per BIMC 2022 Work Plan Table 9.3 (1)			**$102,373,941**	**$100,056,082**	**$2,317,866**	**$1,787,141**	**$1,787,141**

(1) Taken from Table 9.3 on page 26 of the 2022 Work Plan.
(2) Total BIMC 2022 Global Estimate does not equal the sum of the BIMC 2022 Marginal Estimate and the BIMC 2021 Reconciled Global Estimate. This is further discussed in Section 5.4.2.6.

5. Findings and Comments

This section highlights the findings and comments identified during the review of the documents presented by Baffinland listed in Section 2.1 of this report.

5.1. Interim Closure and Reclamation Plan

The BIMC 2022 Estimate is based in the Interim Closure and Reclamation Plan (BAF-PH1-830-P16-0012) Rev 5, October 30, 2018, submitted in the BIMC 2022 Work Plan with no change from the previous year. The issues regarding the generation of acid rock drainage (ARD) and metal leaching (ML) have been addressed separately through the revised Phase 1 Waste Rock Management Plan (WRMP) issued in June 2020 and approved by the NWB on August 17, 2020. The ICRP and closure costs should be updated based on this newly approved WRMP and in consideration of the ongoing monitoring program. The WRMP is essentially relying on encapsulating thinner lifts of Potential Acid Generating (PAG) material with Non-AG (Acid Generating) material and allowing permafrost aggregation within the Waste Rock Facility (WRF). This plan is valid provided: there is complete freezing over the winter months, although there is some room for variation based on the results of the humidity cell test; and there is no heat generation from exothermic reactions with the rock pile that may cause thawing and subsequent release of ARD/ML from the waste rock profile as a result of either mobilisation of soluble acidic sulphates and/or oxidation of iron sulphides. Monitoring and continued testing is required to verify the performance of the new WRF design and inform closure planning and costing.

At closure the entire WRF will be capped with 50 m of Non-AG material with the upper few meters consisting of the active zone (rock where freeze and thaw occurs, and season shallow groundwater will be discharging from the rock pile). Runoff from the WRF will report to the management pond for treatment. Once sampling and monitoring shows the water quality meets the water quality objectives runoff will be discharge directly to the environment. Ongoing water treatment was recommended during operations until the pond water meets the water quality objectives. Post closure water quality was not predicted as part of the water quality model. This remains as a large uncertainty.

Water treatment is currently proposed for point source (direct) discharges from the sediment and water storage ponds around the Mine Site and Milne Port if the water quality is greater than the discharge criteria. When considering aqueous non-point source emissions, the ICRP refers to potential contaminants of concern as total suspended solids, petroleum hydrocarbons and/or nutrients. Other non-point source contaminants typically encountered at mines include dissolved and total metal concentrations. The IRCP states groundwater is generally not considered a risk to the project in the receiving water environments because of the underlying bedrock and extensive permafrost limiting migration of potential contaminants via the groundwater pathway. However, it also states there is groundwater flow at the Site that migrates to local surface drainages and lakes, albeit for a short period of the year. The WRMP also identifies the top few metres of soil as being the active zone where shallow groundwater movement is expected. Post closure point source discharge being considered for the residual effects assessment include runoff from the WRF and the pit lake but not the ore storage, crusher area or leakage from water storage ponds. Experience at other closed or abandoned mines shows these areas can be a significant source of point and non-point source emissions to the environment. The ICRP should consider the migration of metals from these mine features to shallow groundwater and surface

water runoff which may be bypassing the monitoring stations and water treatment facilities. These mining features could impact the adjacent receiving waters following mine closure. A commitment was made in the ICRP to expand the groundwater monitoring and sampling program which is currently in place at the landfill. We suggest the BIMC include costs for installation of additional groundwater wells or piezometers downgradient of these mine features where potential impacts from ML/ARD to receiving water bodies and ecological receptors may be present. If metal migration from these features is observed to be impacting the aquatic environment, water treatment may need to be considered.

The current plan for pit closure is the creation of a pit lake which may take 85 to 150 years to fill. During this time the pit wall may release ML/ARD because of either mobilisation of soluble acidic sulphates and or oxidation of iron sulphides (yet to be qualified in terms of loadings at closure) which may require treatment. Water quality predictions for the post closure pit will be developed as the mine progresses and based on the waste rock characterization plan. If ML/ARD are predicted the closure plan considers accelerated pit filling but this is theoretical at this time and there may be significant limitations and challenges to this approach.

For these reasons, or until water quality monitoring and sampling shows compliance with the water quality objectives, we recommend costs for post closure water treatment be re-evaluated. The current contingency for long-term water treatment is approximately 2 million dollars which is significantly less than other mines in northern and remote setting where ML/ARD issues are a concern. The review team considers this is a risk to the closure cost estimate. Based on corporate experience, operating costs for water treatment plants at other base metal mines in northern communities are 3 million dollars per year. BIMC should carry these costs until it can be proven that water treatment is no longer required. Based on the available information, it is our opinion that the current liability estimate held for post-closure water treatment may not cover one year. There is uncertainty related to the quantity of water, treatment process and how many years of post-closure water treatment is required.

5.2. 2021 Inspection Reports Comments

Water licence inspections and biannual geotechnical inspections are a requirement of BIMC's water licence. A geotechnical engineer contracted by BIMC is required to conduct inspections of the earthworks and geological and hydrological regimes. A CIRNAC Water Resources Officer is required to inspect the roads and all mining areas for infractions against the requirements listed in the licence. These inspections provide insight into the ongoing environmental and geotechnical performance of mining operations, support the closure planning process and ultimately refine the closure cost estimate.

The geotechnical inspection report described in detail the earthworks and geological conditions at surface. Closure and long term physical and chemical stability at the mine are being assessed and modelled though instrumentation installed across the mine. The closure plan is dependent on permafrost aggregation in the WRF, documenting the presence and operational status of the geotechnical instrumentation should be included in the biannual geotechnical inspections.

The report is also missing observations of the MS-08 liner and pond which captures runoff from the WRF. This water storage pond is important as it retains contaminated water prior to treatment. Identifying potential leakage areas would mitigate the accidental discharges of contaminated water to the active zone and adjacent receiving water environments. Some comment about its integrity is required; Figure 27 in the geotechnical inspection report appears to indicate liner under stress. Iron staining was observed in

sediments downgradient of the WRF treatment plant and MS-08. The Water Licence inspections should include areas downgradient for the WRF, mine workings, ore storage areas and crusher area for evidence point and non-point sources of contamination, such as iron staining and accumulated TSS in ditch line and water bodies. The geotechnical inspection report also noted damaged liners at MP-05 settling pond and HBW-1 and culvert CV-114D and made a recommendation to repair them as soon as practically possible.

5.3. Arbitration Unit Rates

The BIMC security cost estimates were initially developed employing Hatch's Estimate Breakdown Structure (EBS) approach, as described in the 2014 Complete Project Financial Security Assessment Report (H349000-1000-07-126-0018, Rev. 1, October 31, 2014). In 2015, BIMC adjusted the unit rates for the project following a similar methodology. These rates were carried forward for the subsequent security estimates. The unit rates were again adjusted by BIMC for the 2018 security estimate. The 2020 Arbitration between Baffinland and QIA regarding the 2019 Work Plan sought to resolve areas of "High Uncertainty" and discrepancy between the respective estimates, including the unit rates to be applied. Based on the direction from the Final Award, Baffinland's unit rates as presented in the 2019 Work Plan were updated. As a result, Baffinland has continued to utilize the established methodology from the 2014 Complete Project Financial Security Assessment, with the updated contractor rates included in the 2019 Work Plan.

In 2019, SNC-Lavalin carried out an assessment of unit rates against market conditions, from which, recommend unit rates were developed. At that time, SNC noted that while the summary of the 2020 Arbitration presents some rationale behind the unit rates, the information did not provide an updated version of the 2014 Basis of the Estimate.

As requested by CIRNAC, for the purpose of this Work Plan review, SNC-Lavalin carried out an assessment of unit rates against those at other northern and remote mines we are familiar with. As previously discussed, and agreed upon, the security estimates presented by BIMC are based the 2020 Arbitration rates. The SNC-Lavalin evaluated unit rates versus the 2020 arbitration rates, cost and percent differences and overall comment on costs is provided in Table H. The table only lists the unit rates where significant differences were identified. The other 2020 Arbitration rates listed in Table D were determined to be similar to fair market conditions.

Table H: Comparison of SNC unit rates and Select Arbitration Outcome Rates

Unit	Unit	2021 SLI Evaluated Unit Rate ($/unit)	2020 Arbitration Rate ($/unit)	Difference ($/unit)	% Difference	Comment on Arbitration Rate
Grade & Re-Contour	m2	1.68	1.49	0.19	12.8%	Lower than typical
Culvert Removal	each	1,184.00	862.50	321.50	37.3%	Lower than typical
Light Diesel Tanks	each	3,425.00	2,950.00	475.00	16.1%	Lower than typical
Bridge Removal	each	183,924.00	161,904.80	22,019.20	13.6%	Higher than typical

Table H (Cont'd): Comparison of SNC unit rates and Select Arbitration Outcome Rates

Unit	Unit	2021 SLI Evaluated Unit Rate ($/unit)	2020 Arbitration Rate ($/unit)	Difference ($/unit)	% Difference	Comment on Arbitration Rate
Incinerator	each	9,448.00	7,925.00	1,523.00	19.2%	Lower than typical
Piping	liner m	60.35	53.13	7.22	13.6%	Higher than typical

The select 2020 Arbitration rates provided in Table 5-1 are different than what is generally incurred at remote and northern mines in Canada. The unit rates proposed by BIMC in their 2019 Annual Security Estimate were accepted by QIA and CIRNAC with the caveat that inflation would be added to the unit rates until their subsequent update. A detailed review of how the unit rates were developed is required to understand the source of the discrepancies and implications to the overall closure cost estimate and to inform any potential future updates to the unit rates.

It is recommended that BIMC provide information on, and rationale for, the unit rates listed in Table 5-1. It should be noted that this analysis has no impact on the RECLAIM model, as the RECLAIM model uses the 2020 Arbitration unit rates with added inflation, as agreed upon in the 2020 Arbitration process.

5.4. Discussion of Closure Costing Review

5.4.1. Monitoring period

In the August 2019 BIMC document *Technical Comment Responses, Application to Amend Type A Water Licence 2AM-MRY1325*, CIRNAC emphasizes that the timeframe of 3 years for Closure and 15 years for Post-Closure monitoring proposed by Baffinland in the IRCP security calculations may be an optimistic schedule and too short a timeframe, particularly given uncertainties such as ARD/ML and need for pit water treatment. In CIRNAC TRC# 8 - Security Estimate Calculations in Relation to the ICRP, CIRNAC suggests the timeframe of post-closure monitoring should be extended to 25 years, and the timeframe of interim care and maintenance be extended to 5 years (This suggestion was also made in the CIRNAC 2019 ASR final submission).

5.4.2. Discrepancies between RECLAIM and 2022 BIMC Security Estimate

5.4.2.1. Phase 2 Equipment

This section describes the rationale for inclusion or exclusion of Phase 2 items from the RECLAIM models and the resulting security estimate, including apparent discrepancies between the 2022 BIMC Work Plan, the 2022 BIMC EBS, and previous versions of the RECLAIM related to the securities for Phase 2 items. These discrepancies are split into two categories: demobilization costs and decommissioning costs.

Demobilization Costs of Phase 2 Items

Several items that we have identified as Phase 2 activities during our review were included in the EBS model prepared by BIMC. Although we have included these costs in the RECLAIM model, it is understood

that Phase 2 of the project is currently under review for approval and that a separate assessment of closure liabilities is being carried out under the water licencing process.

Phase 2 items have been present in BIMC annual work plans since 2018. The 2021 Reconciled Global RECLAIM includes the demobilization costs for Phase 2 items that are listed in the 2022 BIMC EBS. The costs currently listed in the 2022 BIMC EBS, and the 2021 Reconciled Global RECLAIM, are a summation costs listed for each item in each successive work plan in which they appear (2018-C1, 2018-MAY, 2019 and 2021-D). Note that these values now match those presented in Table 2-4 of the 2020 Arbitration Summary. For reference purposes, these are indicated in Table I below; in summary $16,798,750 remains in the 2022 EBS as well as the 2021 Reconciled Global RECLAIM for Phase 2 Equipment Mobilization.

Table I: Summary of Phase 2 Costs in the 2022 EBS

Item		Crushing Module	Rail Construction Materials	Car Dumper Module	BMH Conveyors	Screening Module	Shiploader Module	Total
Work Plan / Addendum	2018-C1	$3,142,110	$2,585,802	$4,275,330	$4,172,310	$2,482,782	-	$16,658,334
	2018-MAY	$(3,142,110)	$(1,022,577)	$(4,275,330)	$(4,172,310)	$(2,482,782)	-	$(15,095,109)
	2019	$2,247,381	$1,872,079	$2,550,363	$5,137,401	$3,428,300	$8,385,828	$23,621,353
	2021-D	-	-	-	-	-	$(8,385,828)	$(8,385,828)
RECLAIM Values (Sum of Above)		***$2,247,381***	***$3,435,305***	***$2,550,363***	***$5,137,401***	***$3,428,300***	-	***$16,798,750***

(1) No Phase 2 items were listed in the 2020 BIMC Work Plan or 2020 addendums.

Decommissioning Costs of Phase 2 Items

Section 3.3.1.7 of the BIMC 2018 Marginal Closure Cost Report, states BIMC "allocates $7,100,000 to account for the mobilization of bulk material handling modules to Milne Port in 2018. Bulk material handling modules will not be installed until appropriate approvals are in place however, Baffinland proposes to mobilize the units in 2018 in the event required approvals are in place prior to the 2019 sealift season. This cost allocation is based on the assumption the bulk material handling modules will be demobilized from site in the event of unforeseen closure at a cost of 10% of capital costs."

The Phase 2 decommissioning line items are included in Table 3-6 and Table 3-7 of the BIMC 2018 Marginal Closure Cost Report are not represented in the EBS. In these tables, the 'Owners' of these line items are listed as Thyssen Krupp and 'Contractor'. BIMC has since taken ownership of these items as a result of arbitration.

Previous years RECLAIM estimates include these Phase 2 decommissioning line items, but they are not included in the 2022 BIMC EBS. CIRNAC/SNC-Lavalin's approach is to include items in the RECLAIM only if they are included in the BIMC 2022 EBS. Therefore, the following line items have been removed from the Demobilize Heavy Equipment section of the Mobilization excel sheet in the 2021 Reconciled Global RECLAIM model:

- Crushing Module ($1,500,000);
- Screening Module (1,400,000);
- Car Dumper Module ($2,200,000);
- BMH Conveyors ($1,500,000); and
- Rail Construction Materials ($500,000).

Further rationale for the removal of these line items from the RECLAIM model is that BIMC and CIRNAC have agreed to include these costs as part of the Phase 2 review process. In an e-mail dated December 14, 2020, BIMC stated that it intended to "submit (an) updated estimate with a supplemental package for the NWB in February 2021 in advance of the technical meetings." The progression of this process is unclear as of reporting time.

To ensure the RECLAIM accurately reflects existing operations, we request that BIMC clarify whether the above line items from the 2018 Work Plan have been revised to what is currently in the EBS for Phase 2, or if they should be inserted into the EBS as separate, additional line items. The RECLAIM contains only the line items that appear in the EBS at this time, and the above line items have been removed for the 2021 Reconciled Global RECLAIM model.

Liability

As a final note on Phase 2 items in the RECLAIM, it is understood that Phase 2 items are allocated 100% to IOL liability. As such, the 2021 Reconciled Global RECLAIM model allocated Phase 2 items entirely to IOL Liability. The remainder of Mobilization/ Demobilization line items are allocated in a manner identical to the other indirect costs: a percentage based on land ownership.

5.4.2.2. Inflation & Bonding/Insurance

Based on the 2020 Arbitration outcome, it is our understanding that inflation rate for the ASR will be set based on the consumer price index for Iqaluit, NU, with the base year referenced to the date of the last unit rate update (i.e., month and year of the relevant Work Plan). We have interpreted this to mean that the September 2021 Consumer Price Index (CPI) index applies for this year's ASR, which is indicated to be 2.6%. We have used this value to update the RECLAIM model. As per the setup of this model inflation is only applied to direct costs. This differs from BIMC's EBS model which applies an inflation percentage on both direct and indirect costs. It is unclear what the percentage applied is however we estimate it to be approximately 2.9% (Tables 9.2 (page 21) and 9.3 (page 22)) and subsequent 2022 Work Plan (Table 9.2 (page 25)). It is unclear which month's Consumer Price Index rate is being carried by BIMC into the annual assessment.

BIMC is requested to provide clarification regarding the inflation index and the calculation method that they are using for this portion of their estimate.

5.4.2.3. Bonding and Insurance

BIMC does not carry costs for Bonding and Insurance as part of their model. RECLAIM includes bonding and insurance costs as part of indirect costs which is calculated as 2% of direct costs. BIMC is requested to provide information on how they are accounting for bonding and insurance costs.

5.4.2.4. Contingency

BIMC considers 20% Contingency which is applied on direct costs and indirect costs associated with contaminated soils treatment and post-closure monitoring as per the 2020 Arbitration Summary. The total included for the 2022 Marginal estimate in the 2022 Work Plan is $200,000.

The RECLAIM model applies a contingency of 20% on direct costs which includes contaminated soils and treatment but not post closure monitoring. This represents $210,000 in the 2022 Marginal RECLAIM model. The difference in the costs is due to how contingency is applied within the two models. This discrepancy is minor and is simply noted for accuracy purposes, no action is required by BIMC.

5.4.2.5. Discrepancies Between the 2021 Addendum and 2022 EBS Entries

A discrepancy was noted between the total costs listed in the BIMC 2021 Work Plan Addendum Tables 9.3 and 9.2 compared to the associated entries included in the 2022 EBS. These discrepancies are summarized as follows:

- ‘Tranche 1’, listed in Table 9.2 of the 2021 Work Plan Addendum, lists a total cost reduction (adjusted by inflation) of -$16,099,200. In the 2022 EBS, the line items associated with Tranche 1 amount to -$12,401,000. Upon review, it was noted that the 2022 EBS does not include all indirect line items listed in Table 9.2 of the 2021 Work Plan Addendum. This results in a discrepancy of **-$3,698,200**.
- ‘Tranche 2’, listed in Table 9.3 of the 2021 Work Plan Addendum, lists a total cost reduction (adjusted by inflation) of -$1,496,571 for the demobilization of 3rd party equipment. The 2022 EBS allocates a total of -$1,762,421 line items associated with Tranche 2 (demobilization of 3rd party equipment). This results in a discrepancy of **$265,850.**

5.4.2.6. BIMC 2022 Global Estimate Discrepancies

A discrepancy was noted within the 2022 Work Plan (page 26, Table 9.3) wherein the total Global Estimated Security for 2022 is listed as $104,161,082. However, the sum of columns C (Global Estimate from 2021 Work Plan), D (2021 Work Plan Addendum Tranche 1), E (2021 Work Plan Addendum Tranche 2), and F (2022 Marginal Estimate including 2021 Reconciliation) in this table equals $107,343,736. As a result, BIMC’s 2022 Global value is **-$3,182,654** lower than it would be without this apparent discrepancy.

The discrepancy in Table 9.3 should be reviewed and clarified by BIMC. It should be noted that the value of this discrepancy is similar to the sum of the discrepancies listed above in Section 5.4.2.5. These two issues may be related.

5.4.3. 2021 Reconciliation Comments

To produce the 2021 Reconciled RECLAIM model, we reviewed the BIMC 2021 Global Estimate, 2021 Addendum, and 2022 EBS. In addition to the discrepancies noted in Section 5.4.1 above, several minor discrepancies between these documents were noted and are described below.

Small discrepancies were noted between the number of BIMC owned equipment identified within Table 8.2 (page 15) of the 2021 Work Plan Addendum and the 2022 EBS. The number identified in the 2022 EBS were ultimately used when developing the RECLAIM model. Line items with small differences between the 2022 EBS and 2021 Addendum tables included:

- 48p School Bus: -2 listed in the 2021 Addendum compared to a total of -3 in the 2022 EBS for 2021-R and 2021-D Work Plans;
- 793F Haul Trucks: 3 listed in the 2021 Addendum compared to a total of 2 in the 2022 EBS for the 2021 Work Plan;
- D10 Dozers: -2 listed for the Milne Port and 2 listed for the Mine Site in the 2021 Work Plan Addendum (total of 0) compared to a total of -1 in the EBS for 2021-R, 2021-D and 2021 Work Plans;
- Jet A Truck: 1 listed in the 2021 Addendum compared to a total of 0 listed in the 2022 EBS for the 2021 (value of 1) and 2021-R (value of -1) Work Plans;
- KPM CCM200E Mixer: 1 listed in the 2021 Addendum compared to listed in the 2022 EBS for the 2021 (value of 1) and 2021-R (value of -1) Work Plans;
- The Pressure Washing Truck: 1 listed in the 2021 Addendum compared to a total of 0 listed in the 2022 EBS for the 2021 (value of 1) and 2021-R (value of -1) Work Plans; and
- Cube Truck: 2 listed in the 2021 Addendum compared to a total of 0 listed in the 2022 EBS for the 2021 (value of 2) and 2021-R (value of -2) Work Plans.

To ensure the accuracy of the RECLAIM model, we request the BIMC clarify the quantities of these line items.

5.4.4. 2022 Work Plan and 2022 EBS Review Comments

There are several line items listed in the EBS which are not represented in the text of the 2022 Work Plan. They include:

- ISO Shipping Containers:
  - Enhancement of ERT Training Grounds (2022-17); and
  - Lube/Def Container (E-18).
- Single Trailers (Modular):
  - Washcar (E-10).
- Light & Medium Mobile Equipment:
  - F250 Light Vehicle (E-32);
  - Type 3 E-House (E-26); and
  - Type 1 E-House (E-25).

- Grade and Re-Contour:
  - KM 110.5 Laydown (2019-3);
  - Km107 Stockpile and access Road (2019-23); and
  - KM107 Sedimentation Pond (2019-23).

As of reporting time, BIMC is working on generating the quantities for several line items in the 2022 EBS related to grade and contour changes in disturbed areas based on satellite imagery. These include:

- Actual Disturbed Area Reconciliation – 2021 Satellite Image – Crown Land & IOL;
- Proposed Disturbed Area Reconciliation – 2022 Work Plan and Prior – Crown Land & IOL;
- Reconciled EBS Output – 2014-2022 - Lined – IOL;
- Actual Lined Disturbed Area Reconciliation – 2021 Satellite Image – IOL;
- Proposed Lined Disturbed Area Reconciliation – 2022 Work Plan and Prior – IOL; and
- Reconciled EBS Output – 2014-2022 - Lined – IOL.

In order for the RECLAIM model accurately reflect existing conditions, we request that BIMC review these items and incorporate.

5.5. Summary of Findings

Table J below presents a summary of the findings or clarifications to be requested to BIMC.

Table J: Summary of Findings or Clarifications to be Requested to BIMC

Issue/Discrepancy	Description	Recommendations/Requests to BIMC	Issue identified by CIRNAC in previous reviews
Contaminated Soils in Ore Storage Areas	The ICRP mentions assessment and removal of contaminated soils will occur at closure. We are assuming this requires comparison of soil bulk chemistry to background conditions specific to the area of the mine (i.e., Milne Port, Tote Road and Mine Area). We also assume removal would include onsite landfilling.	Based on corporate experience at mine closure projects, we expect the residual soils under the ore storage areas will contain metal concentrations greater than background conditions. BIMC is requested to provide information as to where these items are captured in the estimate. Should they not be present, CIRNAC requests that additional studies be initiated to confirm these areas are chemically stable and not leaching to nearby water bodies and/or are posing a risk to human health or ecological terrestrial receptors. Following that costs for mitigation of potential impacts should be included in the annual security review.	

Table J (Cont'd): Summary of Findings or Clarifications to be Requested to BIMC

Issue/Discrepancy	Description	Recommendations/Requests to BIMC	Issue identified by CIRNAC in previous reviews
Expanding the groundwater monitoring and sampling program.	Some piezometers were installed near the landfill at the Mine Site and a commitment was made to expand the program. In the ICRP, restoration is described as "The renewing, repairing, cleaning-up, remediation or other management of soil, groundwater or sediment so that its functions and qualities are comparable to those of its original, unaltered state." The ICRP also states the requirement for monitoring of surface and groundwater to ensure discharge criteria are met. The effects assessment in the ICRP did not consider groundwater transport as a point or non-point source.	BIMC should include costs to monitor groundwater where ML/ARD effects to receiving water bodies and ecological receptors are possible. These areas would include the mine workings, WRF, select water storage ponds, ore storage areas and crusher area.	
Water Treatment	Runoff from the WRF shows impacts from ML/ARD. Ongoing water treatment was recommended during operations until the pond water meets the water quality objectives. Post closure water quality was not predicted as part of the water quality model. This remains as a large uncertainty for the review team.	Include contingency for water treatment as per the closure plan until geochemical modelling and groundwater and surface water monitoring and sampling suggest otherwise.	
MS-08 Liner Observations	There were no observations recorded in the geotechnical inspection report. Some iron staining was observed in sediments downgradient of the WRF treatment plant and MS-08. The liner for pond MS-08 capturing runoff from the WRF is an important item. Some observations about its integrity would have been reassuring, the photos appear to indicate liner is under stress (See Figure 27).	Include observations if possible and incorporate into future monitoring events. Include costs for seepage or groundwater sampling in this area, if determined to be feasible.	

Table J (Cont'd): Summary of Findings or Clarifications to be Requested to BIMC

Issue/Discrepancy	Description	Recommendations/Requests to BIMC	Issue identified by CIRNAC in previous reviews
Expansion of the mine site landfill (2021-10, 2022-1) and landfarm (2019-18)	The landfarm is lined but the landfill is not. It is unclear how water is being managed at landfill. Red staining and seepage observed in the geotechnical inspection report can indicate water quality issues that may require mitigation.	Do the result of the preliminary groundwater monitoring program suggest impacts to Sheardown Lake are possible? How will water management occur at this proposed landfill area?	
New Ore Stockpile Area (2022-2) & Run of Mine Stockpile (2019-23)	Expansion of the crude ore stockpile area where visible iron staining in ephemeral channel is noted directly adjacent to the Mary River. Located near the Explosive Magazine storage area. Discharges to Mary River with iron staining visible in satellite imagery.	How will water management occur at this proposed storage area? Will it report to the proposed sediment pond to the northwest? Will this new pond be lined? Ore stockpile areas can be long term sources of contamination post closure. What is BIMC plan to ensure chemical stability here post closure?	
Damaged liners and culverts	Damaged liners (MP-05 settling pond and HBW-1) and culverts (CV-114D) were documented in the geotechnical inspection report with a recommendation to repair them as soon as practically possible.	BIMC should consider allocating costs for additional repairs.	
CIRNAC awaiting disturbed area calculation	CIRNAC is awaiting receipt of results of BIMCs disturbed area calculation based on satellite imagery.	BIMC to complete assessment and provide results to CIRNAC for inclusion into security estimate.	
Phase 2 Equipment Mobilization	Costs remain in the 2022 EBS for Phase 2 Equipment mobilization/ demobilization. These costs are summarized in section 5.4.1 above.	Phase 2 items will continue to be included within this year's estimate with an understanding that these costs represent only demobilization costs. Once Phase 2 approval is received these items will have to have decommissioning costs carried as well within the EBS and therefore Reclaim models.	
Phase 2 Equipment Demobilization	Costs for Demobilization included in Table 3-6 of the 2018 Marginal Closure and Reclamation Financial Security Estimate are not included in the EBS. These costs are summarized in section 5.4.1 above.	BIMC to confirm whether the Phase 2 line items from the 2018 Work Plan have been revised to what is currently in the EBS for Phase 2, or if they should be inserted into the EBS as separate, additional line items.	

Table J (Cont'd): Summary of Findings or Clarifications to be Requested to BIMC

Issue/Discrepancy	Description	Recommendations/Requests to BIMC	Issue identified by CIRNAC in previous reviews
BIMC Owned Equipment numbers and associated security	Small discrepancies were noted between the 2021 Addendum and 2022 EBS for BIMC owned equipment.	Review 2022 EBS compared to the 2021 Work Plan Addendum Table 8.2 to ensure all BIMC owned equipment has been accounted for (i.e., security in place or removed for mobilized, deferred, or demobilized equipment, respectively). See Section 5.4.2 for a list of noted discrepancies.	
2021 Addendum Tranche 1 and Tranche 2 cost reductions do not match 2022 EBS values.	The 2022 EBS does not include indirects outlined in the 2021 Addendum resulting in a missing cost reduction of $(3,612,000) in the EBS. Similarly, the 2022 EBS allocates a cost reduction $265,850 more than the 2021 Addendum for Tranche 2.	BIMC should review and confirm the EBS to include line items matching the 2021 Addendum summary table including the addition of cost reductions to indirect items and verifying the cost reduction associated with the demobilization of 3rd party equipment (Tranche 2).	
Column G Table 9.3 of the BIMC 2022 Work Plan appears to be calculated incorrectly.	In Table 9.3 of the 2022 Work Plan, the total in Column G does not equal a summation of columns C, D, E & F. Note that this error is in addition to the Column "C" issue mentioned above, not a result of it.	Correct column "G" of Table 9.3 in the 2022 Work Plan.	
Several items in the 2022 EBS are missing from the text of the 2022 Work Plan	Details of difference is discussed above in this Section 5.4.	Revise 2022 Work Plan and associated appendices to include missing items.	
Table 8.1 of the 2022 Work Plan lists fuel as a volume, while the 2022 EBS lists fuel as a lump sum $62,000.	It is unclear how BIMC has calculated the lump sum cost of $62,000 based on the fuel volumes presented in Table 8.1.	Provide rationale for calculation of $62,000 fuel cost in Section 8.1 of 2022 Work Plan.	

Table J (Cont'd): Summary of Findings or Clarifications to be Requested to BIMC

Issue/Discrepancy	Description	Recommendations/Requests to BIMC	Issue identified by CIRNAC in previous reviews
BIMC included 20% Contingency	BIMC considers 20% Contingency on direct costs and indirect costs associated with contaminated soils treatment and post closure monitoring. Contingency for the project was increased as a result of ARD/ML issues encountered with the waste rock piles. It would be preferable to include the uncertainties associated with the Waste Rock Pile and the hilltop outcrop where exploitation is taking place as a direct cost rather than a contingency amount. As noted, the marginal difference in the contingency amount is significantly lower than those a mine that may experience such issue in closure may have.	It is recommended that the Waste Rock Pile and hilltop outcrop closure costs be calculated directly by BIMC and be included in the next updated ICRP.	
ICRP Rev.5, has not been updated.	Closure cost should be based on other reclamation concepts (as a cover) until the Baffinland mine could validate that they could manage ARD and metals leaching with their waste rock management plan and considering the updated thermal model.	The ICRP should be updated according to the updated Waste Rock Management Plan approved by NWB, this should include an update of the costs associated with mitigating potential water quality issues until there is certainty that these would not be a concern in the future.	✓
BIMC estimate considers 3 years for Closure and 15 years for Post-Closure monitoring.	According to CIRNAC guidance for duration of interim care & maintenance and post-closure monitoring in the mine site closure & reclamation plan cost estimate. CIRNAC recommended to include 5 years for Closure and 25 years for Post-Closure monitoring.	Interim care and maintenance should be increased to 5 years, and post-closure cost to 25 years.	✓
Long term criteria for permafrost conditions.	Review long term design criteria of BIMC according to state of the art and other mine sites in permafrost conditions, and/or regarding ARD characterization.	Update these items in the ICRP and include in the cost estimate.	✔

Table J (Cont'd): Summary of Findings or Clarifications to be Requested to BIMC

Issue/Discrepancy	Description	Recommendations/Requests to BIMC	Issue identified by CIRNAC in previous reviews
Studies and instrumentation.	Cost for studies and instrumentation not in place yet or needed at the end of mine operations at Baffinland site should be added to the security estimate.	Include cost for studies and instrumentation at the end of mine operations.	✔
Engineering Fees	Engineering Fees does not describe which costs have been considered to calculate the fees. The 2022 Estimate includes an engineering, design and execution planning indirect cost allowance of **$39,000** or 3.9% of the total direct costs, which is the same as last year. The 2022 Work Plan lists four Issued for Construction drawings and six Layout Drawings associated with work in 2022.	BIMC to confirm the 3.9% is still relevant for Engineering Fees given the level of effort described in the 2022 Work Plan. The percent allocation for engineering services for 2022 appears lower than expected given the number of drawings being produced.	✔
Inflation	BIMC calculates inflation for direct and indirect costs applying a percentage of approximately 2.9%. The Consumer Price Index for Iqaluit, NU (September 2021) is 2.6%.	BIMC to review inflation adjustment and confirm which month of the CPI reporting is being followed to set inflation rate.	
2020 Arbitration Outcome unit rates.	As discussed in Section 5.3, the 2020 Arbitration Outcome rates differ from those developed by SNC-Lavalin Inc.	Assumptions and basis for the key Arbitration Outcome unit rates list in Table 5-1 should be provided for review and verification.	

SNC·LAVALIN

6. Closure

This report has been prepared by Jonathan Croston, Cameron Bates and Matt Anderson The report was reviewed by Karola Tóth and Jonathan Cooper.

We trust that this report is to your satisfaction and we will be available to discuss if you have any question regarding this report.

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7.1. Guidelines

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APPENDIX A

SNC-Lavalin 2021 Reconciled Global RECLAIM MODEL

Project Name: **Reclaim Model - Ov**

ffinland Iron Mine **All users are urged to read the Reclaim Model User Man**

Important! Reclaim 7.0 works bett
If other excel files are open ignc

Reclaim Menu

The default Excel menu bar has an additional tab labelled "Add-Ins"

Clear	This option deletes all input data, deletes any duplicated elements a into land costs vs water costs if required.
Duplicate	This option Duplicates components of the project. E.g. if there is mo Quantities for the new Open Pit are erased, but the Activities and C Open Pit subtotal is added to the Summary page.
Unit Costs	This option opens a window of unit costs to provide easy reference. You can select to only see a particular unit (eg km) or multiple units
Print All	This option prints the Summary Worksheet, Unit Cost Worksheet, a balances. Individual worksheets can be printed directly using stand
Quit	Select Quit to exit the program
Help	Redirects user to Instructions worksheet.

WorkSheets

Summary	This worksheet contains a cumulative summary of costs for each co and project management are added as a percentage of the compor
Components	Costs are derived for individual closure and reclamation activities b An activity can be edited, added, or deleted from worksheet. Howe used elsewhere in the program. ***Do not change the content or column width of the first column***
Unit Costs	This worksheet contains a look up table with costs for typical work a

Limitations

The Reclaim Program will NOT work if the worksheets are char
Please review the following prior to modifiying worksheets.

WorkSheet Names	*The names of the worksheets must not be changed.*
Defined Names	Certain cells have defined names, which must not be changed. Wh the left of the formula bar.
First line of data	The first line of data for any component worksheet starts on line 4. ***the component name.***
Cell A1	Cell A1 on the component sheet MUST always contain the count of ***CHANGE.***
Adding Lines	You can add lines to components and the unit cost table, as long as The last line might fall outside the named ranges. You can check th down box at the top left of the sheet. Usually this box has a cell refe
Printing	A component will only be printed if its sub-total is greater than zero. printed if there is an error. Printing has been set to print 1 page per

Conditions of Use

The Reclamation Cost Estimating Model was prepared to serve as a to estimate the cost of mine reclamation. This model is not intended activities required to reclaim a site or to dictate how much should be

Reclaim 7.0 Project: Baffinland Iron Mine

SUMMARY OF COSTS

CAPITAL COSTS	COMPONENT NAME	COST	IOL	LIABILITY
OPEN PIT	Mary River Mine Pit	$5,926,125		$5,926,12
UNDERGROUND MINE		$0		$
TAILINGS FACILITY		$0		$
ROCK PILE	Mine Site Waste Rock Pile	$588,550		$588,55
BUILDINGS AND EQUIPMENT	Mine Site	$10,076,701		$10,076,70
	Milne Port	$9,615,958		$9,982,42
	Tote Road	-$2,107,197		-$3,458,21
	Project Wide/Other	$724,684		$528,63
	BIMC Owned Equipment	$4,850,271		$4,850,27
CHEMICALS AND CONTAMINATED SOIL MANAGEMENT		$6,806,196		$6,650,90
SURFACE AND GROUNDWATER MANAGEMENT		$1,247,071		$1,218,30
INTERIM CARE AND MAINTENANCE		$3,423,145		$3,344,17
	SUBTOTAL: Capital Costs	**$41,151,505**		**$39,707,87**
	PERCENT OF SUBTOTAL			**97.13**

Reclaim 7.0 Project: Baffinland Iron Mine

1 **Rock Pile Name:** **Mine Site Waste Rock Pile**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land
STABILIZE SLOPES							
COVER ROCK PILE							
VERY LOW PERMEABILITY COVER (in addition to above)				No additional line items from 2021 Marginal or 2021 Addedum			
CONSTRUCT DIVERSION DITCHES							
CONSTRUCT SEEPAGE COLLECTION POND							
INSTALL GROUNDWATER COLLECTION SYSTEM							
RELOCATE DUMPS							
SPECIALIZED ITEMS							
Grade and Contour Waste Rock dump		m2	395000	20GCS	$1.49	$588,550	100%
TREAT ROCK PILE SEEPAGE - see "Water Management"							
HEAP LEACH SEEPAGE TREATMENT - Cyanide Detox							
					Annual treatment costs	$0	
Number of years of treatment		years					
					Total treatment costs	$0	
HEAP LEACH SEEPAGE TREATMENT - ARD/ML**							
Upgrade/modify pumping system - report to WTP		allow		#N/A	$0.00	$0	
					Total	$588,550	
					% of Total		

* For construction of passive treatment system refer to "Water Management". ARD/ML seepage treatment becomes post-closure water treatment cost

**Heap leach ARD/ML seepage treatment becomes post-closure water treatment cost

Reclaim 7.0 Project: Baffinland Iron Mine

Open Pit Name:		Mary River Mine Pit		
ACTIVITY/MATERIAL	**Notes**	**Units**	**Quantity**	**Cost Code**
CONTROL ACCESS				
STABILITY STUDY	No additional line items from 2021 Marginal.			
STABILIZE SLOPES				
COVER/CONTOUR SLOPES				
CONSTRUCT DIVERSION DITCHES				
CONSTRUCT SPILLWAY				
RECLAIM QUARRIES (the unit cost is inclusive of backfill, compaction and scarification with a dozer)				
Various Quarries (Mine)	2020 EBS	m2	480,365	20GCS
Various Quarries (Tote Road)	2020 EBS	m2	3,496,900	20GCS
GRADING AND CONTOURING SIGNIFICANTLY DISTURBED AREAS (the unit cost is inclusive of backfill, compaction and scarification with a dozer)				
Number of years of pump flooding		years		
				Total pum

Chemicals/Soil Area Name:

Note: The procedures, equipment and packaging for clean up and removal of chemicals or contaminated soils are highly dependent on the nature of the chemicals and their existing state of containment. Government guidelines should be consulted on an individual chemical basis. Any estimate made here should be considered very rough unless specific evaluations have been conducted.

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% La
HAZARDOUS MATERIALS AUDIT							
BUILDING DECONTAMINATION & CONSOLIDATION OF HAZARDOUS MATERIALS							
HAZARDOUS MATERIALS REMOVAL							
HAZARDOUS MATERIALS							
CONTAMINATED SOILS							
CONTAMINATED SOIL REMOVAL							
Contaminated Soil Treatment	No 2018 unit rate availabe	m3	16164	15CSTS	$14.78	$238,904	10
Contaminated Soil Treatment (2017 Work Plan)	Marginal increase associated with 2017 Work Plan. Spill 16-283 at Milne Port Bulk Fuel Tank Farm. No 2018 unit rate availabe	m3	8464	15CSTS	$14.78	$125,098	10
Excavate and transport		m3		#N/A	$0.00	$0	
Manage hydrocarbon remediation		m3		#N/A	$0.00	$0	
Reagents/stabilizing agent		m2		#N/A	$0.00	$0	
Excavate and transport to offsite facility		m3		#N/A	$0.00	$0	
Contour decontaminated area		m3		#N/A	$0.00	$0	
CONTAMINATED SOIL VERY LOW PERMEABILITY COVER							
OTHER							
Ammonium nitrate (explosive material)	2019 estimate (See section 3.3.2.2 of 2019	m3	12143	16AN1S	$358.00	$4,347,194	10
Hazardous Substances	2020 Arbitration Outcome	m3	5500		$358.00	$1,969,000	
Fuel	2020 Revised Workplan	LS	1	EBS	$21,000.00	$21,000	
	2020 Abritration outcome	LS	1	EBS	$30,000	$30,000	
	2021 Marginal (2021 Work Plan)	LS	1	EBS	$49,000.00	$49,000	10
	2021 Addendum (2022 EBS)	LS	1	EBS	$26,000.00	$26,000	10
					Total	$6,806,196	
					% of Total		

Building / Equip Name: **Mine Site**

ACTIVITY/MATERIAL	Notes	U
DISPOSE MOBILE EQUIPMENT - Unit Costs includes disassembly and decontamination required for on-site dis		
DISPOSE MECHANICAL EQUIPMENT - Unit Costs includes disassembly and decontamination required for on-s		
	Light non- fuel storage tanks. The cleaning, plugging, disassembly and removal of all associated pipeline infrastructure is included (Ref 1, pg 26).	ea
	Light non- fuel storage tanks. The cleaning, plugging, disassembly and removal of all associated pipeline infrastructure is included (see Tables 2-4 & 3-4 of 2018 Marginal Estimate). (see Tables 3-4 of 2019 Marginal Estimate).	ea
Light Tanks		
	2020 Revised Work (net zero)	ea
	2020-R: - Water Tank 15,000L (1) - Water Tank 1,000L (3)	ea
	Medium non- fuel storage tanks. The cleaning, plugging, disassembly and removal of all associated pipeline infrastructure is included (Ref 1, pg 26).	ea
Medium Tanks		
	Medium non- fuel storage tanks. The cleaning, plugging, disassembly and removal of all associated pipeline infrastructure is included (see Tables 2-4 & 3-4 of 2018 Marginal Estimate).	ea
	Small fuel tanks (10,000-20,000L) (Ref 1, pg 27)	ea
Light Diesel Tanks	Small fuel tanks (10,000-20,000L) 2017 actual not previously allocated (see Tables 2-4 & 3-4 of 2018 Marginal Estimate) (see Table 3-4 of 2019 Marginal Estimate)	ea
	Medium fuel tanks (500,000-750,000L). The cleaning, plugging, disassembly and removal of all associated pipeline infrastructure is included (Ref 1, pg 27).	ea
Medium Diesel Tanks		
	Medium fuel storage tanks. The cleaning, plugging, disassembly and removal of all associated pipeline	

Reclaim 7.0 Project: Baffinland Iron Mine

Building / Equip Name:	**Mine Site**	
ACTIVITY/MATERIAL	**Notes**	**U**
Fold Away Buildings	2017 Work Plan add 1500 m2 Truck wash Building 2018 Work Plan see table 3-1 add 4230 m2 2019 estimate (See table 3-1 of 2019 Marginal Estimate)	m
	2021 Workplan: - Heated Maintenance shops (2) for pit equipment at KM110.5 laydown	m
Soft-Walled	2017 Work Plan Addendum Maintenance Garage at Mine Site	m
ISO Shipping Containers (Shelters, Comm. Facilities)	2017 Work Plan add 500 m2 Tire Shop	m
BREAK FOUNDATIONS		
Precast Foundations	Includes load and transport of precast concrete foundations (Ref 1, pg 34). Add 2017 Work Plan Truck Wash Building foundation of 1500 m2. Add 2017 Work Plan addendum 800 person temp hard walled camp at mine 4333 m2.	m
Slab on Grade	Includes perforating the concrete slabs on grade Includes perforating the concrete slabs on grade 2017 Work Plan Addendum for pre-cast conrete foundation and Maintenance Garages at Mine Site 2046 m2	m
	2020 Revised Workplan: - Concrete Pad for tire maintenance at 110 Laydown	m
	2021 Workplan: - Concrete pad apron for exterior of HD Shop - Concrete Pad for tire maintenance and welding shop at 110 Laydown	m
Timber Cribbing	Includes disassemby load and transport of the timber cribbing	m
GRADE AND CONTOUR, GENERAL - Unit costs are inclusive of backfill, compaction and sacrfication with a doz		
	2020 EBS	m
Grade and contour (on IOL): - laydown areas - building footprints	2021 Workplan - Mine Site workshops & and crushing area	

Building / Equip Name: **Mine Site**

ACTIVITY/MATERIAL	Notes	U
	Includes the removal, loading, hauling and disposal of cable (Ref 1, pg 41). 2017 Work Plan add 3500 m of cable.	m
Electrical Cable	2020 Revised Workplan: - Cabling for Lighting at Mine Site Warehouse	m
	2021 Workplan: - Power Distribution System - Electrical Cable Installation - Mary River Powerhouse to Dyno Nobel explosives facility (500 m), and Mary River E-House 3 to KM 104 laydown (300 m)	m
Incinerator	Equipment quanties updated to reflect 2017 Work Plan addendum Table 3-6 2 units one at Milne Port and one at Mine Site.	ea
	2020 Revised Workplan	ea
Remove Piping	2020 Revised Workplan: - Trasfer line for Deposit 1 to Waste Rock Facility - Fuel Line from new (2019) bulk fuel storage facility to existing bulk fuel storage facility estimate	m
Potable Water	Equipment quanties updated to reflect 2017 Work Plan addendum Table 3-6 2 units one at Milne Port and one at Mine Site.	ea

Building / Equip Name:	**Milne Port**	
ACTIVITY/MATERIAL	**Notes**	**Un**
DISPOSE MOBILE EQUIPMENT - Unit Costs includes disassembly and decontamination required for on-site dispo		
DISPOSE MECHANICAL EQUIPMENT - Unit Costs includes disassembly and decontamination required for on-site		
Light Tanks	Light non- fuel storage tanks. The cleaning, plugging, disassembly and removal of all associated pipeline infrastructure is included (Ref 1, pg 26).	eac
	2020 Revised Workplan	eac
Medium Tanks	Medium non- fuel storage tanks. The cleaning, plugging, disassembly and removal of all associated pipeline infrastructure is included (Ref 1, pg 26).	eac
	Small fuel tanks (10,000-20,000L) (Ref 1, pg 27)	eac
Light Diesel Tanks	2020-R: -Diesel Tank 1,000L (-2) -Diesel Tank 9,000L (-1)	eac
Medium Diesel Tanks	Medium fuel tanks (500,000-750,000L). The cleaning, plugging, disassembly and removal of all associated pipeline infrastructure is included (Ref 1, pg 27). Add a tank from the 2017 Work Plan Addendum - Milne Port	eac
Large Diesel Tanks	Large fuel tanks (3ML-5ML). The cleaning, plugging, disassembly and removal of all associated pipeline infrastructure is included (Ref 1, pg 27). Add a tank from the 2017 Work Plan Addendum - Milne Port	eac
Largest Diesel Tanks	Largest fuel tanks (>5ML-15ML). The cleaning, plugging, disassembly and removal of all associated pipeline infrastructure is included (Ref 1, pg 27). Add a tank from the 2017 Work Plan Addendum - Milne Port	eac
Misc. Items	On-site disposal. Miscellaneous (minor) items were defined as any item less than 200 kg not captured in other unit costs (Ref 1, pg 42).	eac
REMOVE BUILDINGS - Unit Costs include disassembling, removing or securing all items and load and transport		
	Trailers and pre-fabricated buildings. (Ref 1, pg 29). Add 2017 Work Plan 49-person Camp (ATCO, not soft-walled, 950 m2) Add 2017 Work Plan Addendum includes 380 person temp hardwall camp , construction offices, lunch rooms and washcars at both Mine Site and Milne	m2

Building / Equip Name:	**Milne Port**	
ACTIVITY/MATERIAL	**Notes**	**Un**
Modular	2021 Workplan: - Washcar for Ore Pad - New warehouse (seacan tent) on laydown LP2 - Parts/staging area (seacan tent structure) - Offices /workshops at the stockpile and shiploader	m2
Fold Away Buildings		m2
	2021 Workplan: - Fold Away Building Contaminated (480 ft2)	m2
Soft-Walled	Add 2017 Work Plan Addendum Maintenance Garage at Milne Port 2046m2	m2
ISO Shipping Containers (Shelters, Comm. Facilities)		m2
BREAK FOUNDATIONS		
Precast Foundations	Includes load and transport of precast concrete foundations (Ref 1, pg 34).	m2
Slab on Grade	Includes perforating the concrete slabs on grade Includes perforating the concrete slabs on grade 2017 Work Plan Addendum for pre-cast conrete foundation and Maintenance Garages at Milne Site Add 10046 m2	m2
Timber Cribbing	Includes disassemby load and transport of the timber cribbing	m2
GRADE AND CONTOUR, GENERAL - Unit costs are inclusive of backfill, compaction and sacrfication with a dozer		
Grade and contour: - laydown areas - building footprints - infrastructure pads	2020 EBS	m2
Grade and Re-Contour Reconciliation **(on IOL)**	2021-R - Actual Disturbed Area - 2020 Satellite Image - Proposed Disturbed Area - 2021 Work Plan and Prior - Reconciled EBS Input 2014-2021	m2
Grade and Re-Contour Reconciliation **(on Crown Land)**	2021-R - Reconciled EBS Input 2014-2021 - Actual Disturbed Area - 2020 Satellite Image - Proposed Disturbed Area - 2021 Work Plan and Prior	m2

Building / Equip Name: **Milne Port**

ACTIVITY/MATERIAL	Notes	Un
Potable Water		
	2020-R (Desalination Plant)	eac
	2021 Workplan: - Desalination Plant	eac

Reclaim 7.0 Project: Baffinland Iron Mine (Bas

1	**Building / Equip Name:**	**Tote Road**

ACTIVITY/MATERIAL	**Notes**
DISPOSE MOBILE EQUIPMENT - Unit Costs includes disassembly and decontamination required for on-sit	
DISPOSE MECHANICAL EQUIPMENT - Unit Costs includes disassembly and decontamination required fo	
REMOVE BUILDINGS - Unit Costs include disassembling, removing or securing all items and load and trans	
Modular	
Modular **- 100% on IOL**	2020 Revised Workplan: - Washrooms at KM26 and KM 80 IT Towers
Modular **- 100% on Crown Land**	2020 Revised Workplan
Fold Away Buildings	
ISO Shipping Containers (Shelters, Comm. Facilities)	Assume 7% on Crown Land 2017 Actual work not previously allocated (see Table 2-3 of 2018 Marginal cost) Add 1050 m2
REMOVE CONTAMINATED BUILDINGS - Unit Costs include disassembling, removing or securing all items	
Modular	
Fold Away Buildings	Mobile Maintenance Depot (100% on Crown Land)
ISO Shipping Containers (Shelters, Comm. Facilities)	
Temporary Construction Warehouse and Office Allowance	
BREAK FOUNDATIONS	
Slab on Grade	Mobile Maintenance Depot (100% on Crown Land)
Timber Cribbing	Includes disassemby load and transport of the timber cribbing. Assume 7% on Crown Land
GRADE AND CONTOUR, GENERAL - Unit costs are inclusive of backfill, compaction and sacrfication with	
Culvert Removal	
	2020 EBS
Grade and Re-Contour Reconciliation **(on IOL)**	2021-R: - Actual Disturbed Area - 2020 Satellite Image - Proposed Disturbed Area - 2021 Plan & Prior - Reconciled EBS Input 2014-2021 2021-D: - Quarry Areas: Q1, PQ2a, PQ12a, Q5, and Q5 expansion; and,

Reclaim 7.0 Project: Baffinland Iron Mine

Building / Equip Name: **Mine Site**

ACTIVITY/MATERIAL	Notes	Un
DISPOSE MOBILE EQUIPMENT - Unit Costs includes disassembly and decontamination required for on-site dispo		
Light Mobile Equipment	2020 Revised Workplan	ea
	2020-R	ea
	Arbitration Reconciliation for 2020 Work Plan	ea
	2020Arbitration Outcome	ea
	2021 Workplan	ea
	2021-R	ea
	2021-D	ea
Medium Mobile Equipment	2020 Revised Workplan	ea
	2020-R	ea
	2020Arbitration Outcome	ea
	Arbitration Reconciliation for 2020 Work Plan	ea
	2021 Workplan	ea
	2021-R	ea
	2021-D	ea
Heavy Mobile Equipment	2020 Revised Workplan	ea
	2020-R	ea
	2020Arbitration Outcome	ea
	Arbitration Reconciliation for 2020 Work Plan	ea
	2021 Workplan	ea
	2021-R	ea
	2021-D	ea
DISPOSE MECHANICAL EQUIPMENT - Unit Costs includes disassembly and decontamination required for on-site		

Reclaim 7.0 Project: Baffinland Iron Mine (Bas

1	**Building / Equip Name:**	**Project Wide/Other**

ACTIVITY/MATERIAL	**Notes**	**U**
DISPOSE MOBILE EQUIPMENT - Unit Costs includes disassembly and decontamination required for on-site disp		
DISPOSE MECHANICAL EQUIPMENT - Unit Costs includes disassembly and decontamination required for on-si		
REMOVE BUILDINGS - Unit Costs include disassembling, removing or securing all items and load and transport		
REMOVE CONTAMINATED BUILDINGS - Unit Costs include disassembling, removing or securing all items, dec		
BREAK FOUNDATIONS		
GRADE AND CONTOUR, GENERAL - Unit costs are inclusive of backfill, compaction and sacrfication with a doz		
GRADE AND CONTOUR, WITH LINER - Unit costs include liner removal and disposal, backfill, compaction and s		
LANDFILL FOR DEMOLITION WASTE		
Place fill material over demolition waste	Includes drill and blasting of material aggregated crushing, excavation of fill material, load and haul of fill material, backfill and compact source of material, and fill application. Assumes avg fill depth of 1.5m over 6m of demolition waste (Ref 1, pg 17). 2017 Work Plan and BIMC Nov. 24 EBS revision add 1192 m2 for disposal of 2017 mobile and mechanical equipment (107 units in total)	
Crown Land	EBS 2020 - Fill Application - Shiploader	
RECLAIM ROADS		
SPECIALIZED ITEMS		

Note:

Reclaim 7.0 Project: Baffinland Iron Mine

1 **Capital Expenditures and Short Term Water Treatment identified in 'Instructions' worksheet**

ACTIVITY/MATERIAL	Notes	Units	Qu
BREACH DYKE EMBANKMENT			
STABILIZE SEDIMENT PONDS/WATER MANAGEMENT PONDS			
Place soil cover		m3	
Doze & spread excavated material		m3	
Vegetate spread material		ha	
Rip rap in channel base		each	
Grade and Contour with liner	Includes liner removal and disposal (Ref 1, pg 21) and backfill, compaction and scarifcation with a dozer (Ref 1, pg 19).	m2	4
REDIRECT RUNOFF/CONSTRUCT DIVERSION DITCHES			
BREACH DITCHES			
DECOMISSION FRESH WATER SUPPLY			
WATER CONTROL IN RECLAMATION QUARRY			
REMOVE PIPELINES			
Remove pipes	The unit cost includes the cleaning, plugging, disassembly, loading, hauling and disposal of piping (Ref 1, pg 41).	m	
GROUNDWATER COLLECTION SYSTEM			
CONSTRUCT CONTAMINATED WATER STORAGE POND			
CONSTRUCT PASSIVE TREATMENT SYSTEM (e.g. Constructed Wetland)			
CONSTRUCT WATER TREATMENT PLANT			

For cost of long-term/post-closure water treatment see "WATER TREATMENT" Worksheet"

Reclaim 7.0 Project: Baffinland Iron Mine

1 **Interim Care and Maintenance (3 Year duration)**

ACTIVITY/MATERIAL	Notes	Units	Quantity	
INTERIM CARE & MAINTENANCE				
on-site caretaker	Three caretakers for 36 months (assume 2 at 3w/1w and 1 at 2w/2w rotation). Assume 72 days of travel for each caretaker over 60 months. 10-hr days.	hr	20880	2
extra personnel	Assume crew of 15 people for 56, 10-hr days, to stabalize site and equipment at both the Mine Site, and Milne Port. Blended unit rate is used to allow for different skill levels that would make up the crew.	hr	8400	2
Mobilization of Workers Required for Stabilization Period (from northern communities)	Assume two rotations per worker, 30% from northern communities and 70% from southern communities. Mobilization from the south is $85.45/person days on site, and from the north $75/person-days on site (Ref 1).	person-days	252	2
Mobilization of Workers Required for Stabilization Period (from southern communities)	Assume two rotations per worker, 30% from northern communities and 70% from southern communities. Mobilization from the south is $85.45/person days on site, and from the north $75/person-days on site (Ref 1).	person-days	588	2
Camp accomodations- stabilization period	15 workers for 56 days	person-days	840	2
Camp accomodations for caretakers	36 month duration full time	person-days	3,240	2
Equipment - site stabilizaiton	Assume 1 dozer, 56 days, 10 hr/day	hr	560	
misc. supplies		allow		a
SNP/AEMP water sampling & reporting		each	3	1
geotechnical assessment		each	3	1
environmental assessment	Assumes spending 1st year budget for this type of activity for interim care	each	1	R
Number of years of ICM		years	3	

Reclaim 7.0 Project: Baffinland Iron Mine

1 Post-Closure Monitoring & Maintenance:

ACTIVITY/MATERIAL	Notes	Units	Quantity	
MONITORING & INSPECTIONS				
Annual geotechnical inspection	Assume 2 geotech inspections are specified at year 4 and 8 (Ref 2, pg 81).	each	2	1
	2019 estimate (See section 3.3.2.6 of 2019 Marginal Estimate)	LS	1	
Survey inspection		each		
Regulatory costs*	Annual reporting over 8 years. Unit rate from RECLAIM.	each	8	R
Site water monitoring (AEMP and SNP)	Annual reporting over 8 years. Unit rate from RECLAIM.	each	16	1
- Active closure and flooding		each		
- Post pit flooding		each		
Air Quality Monitoring Program (AQMP)	Assume 3 sampling events specified at year 2, year 4 and year 7 (Ref 2, pg 81). Unit rate from RECLAIM.	each	3	R
	2019 estimate (See section 3.3.2.6 of 2019 Marginal Estimate)	LS	1	
Wildlife Effects Monitoring Program (WEMP)	Assume 2 sampling events specified at year 5 and year 7 (Ref 1, pg 81). Unit rate from RECLAIM.	each	2	R
	2019 Marginal. Assume sampling events specified year 1 to 5.	each	0	
Vegetation Monitoring		each		
Project Environmental Assessment	Assume carried once (1x) during closure/post closure period year 4; at Mine site, Tote Road and Milne Port (Ref 2, pg 81). Unit rate from RECLAIM.		3	R
	2019 estimate (See section 3.3.2.6 of 2019 Marginal Estimate)	LS	1	
Short Term Temporary Care and Maintenance Program	2019 estimate (See section 3.3.2.6 of 2019 Marginal Estimate)	LS	1	
Permitting	2020 estimate (See section 3.3.2.6 of 2019 Marginal Estimate)	LS	1	

Reclaim 7.0 Project: Baffinland Iron Mine

1 Mobilization/Demobilization:

ACTIVITY/MATERIAL	Notes
MOBILIZE HEAVY EQUIPMENT	
MOBILIZE MISC. EQUIPMENT	
Mobilization and Demobilization of Phase 2 Equipment and Materials Required for Reclamation (2019)	2018 to 2019: Crushing Module 2018 to 2019: Rail Construction Mate 2018 to 2019: Car Dumper Module 2018 to 2019 BHM Conveyors 2018 to 2019: Screening Module 2019: Shiploader Module 2021-D: Shiploader Module
Mobilization and Demobilization of Equipment and Materials Required for Reclamation (2019)	2019 estimate (Demob. Of hazardous associated with the Water Treatment WRF)
Mobilization and Demobilization of Equipment and Materials by Sealift	Sea Containers 2020 Revised Workplan 2021 Workplan
Mobilization and Demobilization of Equipment and Materials for 2017 Work Plan addendum	Assumed 10% of marginal 2017 Wor Direct costs(minus Soil and Water m ICM components) i.e., $5,554,000 fr Marginal Summary Worksheet.
Mobilization and Demobilization of Equipment and Materials for 2018 Work Plan	Assumed 10% of marginal 2018 Wor costs(minus Soil and Water manager components) i.e., $2,600,700 from B Marginal Summary Worksheet.
Off-site Disposal of Waste	Ref 1 pg 59 Cost to remove additional 49 bed spa site in 2017 Work Plan.
Consumables (2017 Work Plan marginal increase)	2017 Work Plan addendum (table 3-7 to a 800 person and 50 person camp

Reclaim 7.0 Project: Baffinland Iron Mine

1 **Underground Mine Name**

ACTIVITY/MATERIAL	Notes	Unit	Qty	Co
CONTROL ACCESS				
REMOVE HAZARDOUS MATERIALS				
INSTALL BULKHEADS				
FLOOD MINE				
INSTALL GROUNDWATER COLLECTION SYSTEM				
SPECIALIZED ITEMS				

Reclaim 7.0 Project: Baffinland Iron Mine

1 **Tailings Impoundment Name:**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Co Co
CONTROL ACCESS				
STABILIZE EMBANKMENT(S)				
COVER TAILINGS				
BURY PAG ROCK				
STABILIZE DECANT SYSTEM				
REMOVE TAILINGS DISCHARGE				
CONSTRUCT DIVERSION DITCHES				
FLOOD TAILINGS				
UPGRADE SPILLWAY				
CONSTRUCT SEEPAGE COLLECTION POND				
INSTALL GROUNDWATER COLLECTION SYSTEM				
SPECIALIZED ITEMS				
TREAT SEEPAGE - see "Water Management" and "Water Treatment"				
TREAT SUPERNATANT				
				Ann
Number of years of treatment		years		
				To

* for construction of passive treatment system refer to "Water Management"

Reclaim 7.0 Project: Baffinland Iron Mine

1 **Post Closure Water Treatment - Identified as long term/post-closure in 'Instructions' worksheet**

ACTIVITY/MATERIAL	Notes	Units	Quantity
ADDITION OF REAGENTS TO WTP			
LABOUR AND SUPPLIES			
WATER MANAGEMENT			
WTP WATER SAMPLING AND ANALYSES			
SITE ACCESS			
ANNUAL ADJUSTMENT			
Increase for Water Treatment (In 2022 EBS, Missing from 2021 EBS)		allow	

Unit Cost Table (for refining unit costs see "Estimator" worksheet)

Filter by unit

ITEM	Detail	COST CODE	UNITS	LOW $	HIGH $	SPECIFIED $	Old SNC Rates
SLI Evaluated Unit Rate ($/unit) (2019)							
	Grade and Contour	20GC	m2			$1.49	1.68
	Grade and Contour With Liner	20GCL	m2			$4.12	5.28
	Grade and Contour Disturbed Area	20GCD	m2				
	Fill Application	20PF	m2			$38.83	42.15
Cost for On-Site Disposal of Equipment:							
	Light Mobile Equipment	20MOL	Ea			729.2	977
	Medium Mobile Equipment	20MOM	Ea			1,162.5	1528
	Heavy Mobile Equipment	20MOH	Ea			2,075.0	2506
	Other mobile equipment (reclaim conveyor)	20MOR	Ea				
	Light mechanical equipment - Decor	20LME	Ea			1,583.8	1829
	Medium mechanical equipment - De	20MME	Ea			3,392.5	4002
	Heavy mechanical equipment - Dec	20MEH	Ea			32,950.0	38025
	Light Tanks	20TL	Ea			1,710.4	2017
	Medium Tanks	20MT	Ea			5,900.0	6851
	Light Diesel Tanks	20LiDT	Ea			2,950.0	3425
	Medium Diesel Tanks	20MDT	Ea			12,982.5	14914
	Large Diesel Tanks	20LDT	Ea			85,157.5	97559
	Largest Diesel Tanks	20XLDT	Ea			137,227.5	157480
	Misc Items (Minor)	20MEI	Ea				
	Fuel tanks - Medium Mobile Diesel T	20MMFT	Ea			$8,381.25	8381.3
Removal of Contaminated Buildings							
	fold away	20RCBF	m2			$114.04	131
	ISO Shipping Container	20RCBI	m2			$23.82	131
	modular	20RCBM	m2			$114.89	131
	soft walled	20RCBS	m2			$128.86	136
		20RCBT	m2				
Removal of Buildings							
	fold away	20RBF	m2			$33.34	37.88
	modular	20RBM	m2			$47.64	54.11
	ISO Shipping Container	20RBI	m2			$23.82	27.06
	soft walled	20RBS	m2			$38.11	43.29
	water and wastewater treatment fac	20WWT	Ea			$8,775.00	
Foundations							
	Precast concrete	20FC	m2			$30.86	35.06
	Slab on grade	20FS	m2			$30.00	34.98
	Timber cribbing	20TC	m2			$16.67	18.94
Reclaim roads							
	Remove bridges	20BR	Ea			$161,904.76	183924
Specialized Items							
	Power distribution - electrical cable	20EC	m			21.3	24.14
	Electrical Cable	20EC	m			21.3	24.14
	Incinerator	20FI	Ea			7,925.0	9448
	Potable Water	20PW	Ea			7,925.0	9448
Blended Labour and Equip Rates (2018)							
	Blended labour rate	20BL	hr			$75.00	90
	Blended equipment rate	20BE	hr			$125.00	125
		20NWS	hr			$75.00	75

Unit Cost Table (for refining unit costs see "Estimator" worksheet)

Filter by unit

	20SWS	hr	$85.45	85.45
	20WACS	person-days	$225.00	225
Water management				
Remove pipes	20RP	m	$53.13	60.35

Reclaim Project:

Unit Cost Estimator

1 Equipment Productivity Figures and Graphs have been reproduced from Caterpillar Per

EXCAVATION

Productivity		
Machine Cat 336EL		
bucket capacity	3.16	m3
fill factor	75%	%
cycle time	45	seconds
operator skill	80%	%
machine availability	83%	%
altitude adjustment	100%	%
Hourly productivity	125.89	m3/hr

Operating Costs		
- Contractor		
Contractor hourly rate	$180.00	$/hr
Excavation cost - contractor rate	1.43	$/m3
- Owner		
ownership, daily		$/day
maintenance		$/hr
fuel		$/hr
consumables (cutters, tires)		$/hr

HAUL AND DUMPING

Productivity		
Machine Cat 770		
truck capacity	25.1	m
fill factor	80%	%
load time	6.0	m
haul distance	1.5	k
average velocity	20.0	k
haul time + return time	9.0	m
wait time	0.5	m
dump time	1.0	m
cycle time	16.5	m
machine availability	83%	%
altitude adjustment	100%	%
	13.7	v
Hourly productivity	88.0	m

Operating Costs		
- Contractor		
Contractor hourly rate	$225.00	$
Haul and Dump - contractor rate	2.56	$
- Owner		
ownership, daily		$
maintenance		$
fuel		$
consumables (cutters, tires)		$

APPENDIX B

SNC-Lavalin 2022 Marginal Estimate RECLAIM MODEL

Project Name:	**Reclaim Model - Overvi**
nd Iron Mine (Bas	**All users are urged to read the Reclaim Model User Manual -**
	Important! Reclaim 7.0 works better wi
	If other excel files are open ignore ru
Reclaim Menu	The default Excel menu bar has an additional tab labelled "Add-Ins" tha
Clear	This option deletes all input data, deletes any duplicated elements and into land costs vs water costs if required.
Duplicate	This option Duplicates components of the project. E.g. if there is more t Pit. Quantities for the new Open Pit are erased, but the Activities and C The new Open Pit subtotal is added to the Summary page.
Unit Costs	This option opens a window of unit costs to provide easy reference. NO You can select to only see a particular unit (eg km) or multiple units (km
Print All	This option prints the Summary Worksheet, Unit Cost Worksheet, and t balances. Individual worksheets can be printed directly using standard
Quit	Select Quit to exit the program
Help	Redirects user to Instructions worksheet.
WorkSheets	
Summary	This worksheet contains a cumulative summary of costs for each comp engineering and project management are added as a percentage of the
Components	Costs are derived for individual closure and reclamation activities by mu An activity can be edited, added, or deleted from worksheet. However, and used elsewhere in the program. ***Do not change the content or column width of the first column of***
Unit Costs	This worksheet contains a look up table with costs for typical work asso
Limitations	***The Reclaim Program will NOT work if the worksheets are change*** ***Please review the following prior to modifiying worksheets.***
WorkSheet Names	*The names of the worksheets must not be changed.*
Defined Names	Certain cells have defined names, which must not be changed. Where to the left of the formula bar.
First line of data	The first line of data for any component worksheet starts on line 4. ***Do the component name.***
Cell A1	Cell A1 on the component sheet MUST always contain the count of tha ***NOT CHANGE.***
Adding Lines	You can add lines to components and the unit cost table, as long as the The last line might fall outside the named ranges. You can check the s drop down box at the top left of the sheet. Usually this box has a cell re
Printing	A component will only be printed if its sub-total is greater than zero. In printed if there is an error. Printing has been set to print 1 page per co
Conditions of Use	The Reclamation Cost Estimating Model was prepared to serve as a gu others to estimate the cost of mine reclamation. This model is not inter determine the activities required to reclaim a site or to dictate how much
	Reclaim was prepared by Bradio Consulting Ltd. on behalf of AANDC

CAPITAL COSTS	COMPONENT NAME	COST	IOL	LIABILIT
OPEN PIT	Mary River Mine Pit	$0		$
UNDERGROUND MINE		$0		$
TAILINGS FACILITY		$0		$
ROCK PILE	Mine Site Waste Rock Pile	$0		$
BUILDINGS AND EQUIPMENT	Mine Site	$839,149		$839,14
	Milne Port	$21,076		$21,07
	Tote Road	$9,397		$9,39
	BIMC Owned	$117,471		$117,47
CHEMICALS AND CONTAMINATED SOIL MANAGEMEN		$62,000		$62,00
SURFACE AND GROUNDWATER MANAGEMENT		$0		$
INTERIM CARE AND MAINTENANCE		$0		$
	SUBTOTAL: Capital Costs	**$1,049,093**		**$1,049,09**
	PERCENT OF SUBTOTAL			**100.00**

BIMC 2022 Workplan:

INDIRECT COSTS	COST	IOL	LIABILIT
MOBILIZATION/DEMOBILIZATION	$339,000		$339,00
POST-CLOSURE MONITORING AND MAINTENANCE	$7,307		$7,30

Reclaim 7.0 Project: Baffinland Iron Mine (Bas

1	**Open Pit Name:**	**Mary River Mine**

ACTIVITY/MATERIAL	**Notes**
CONTROL ACCESS	
STABILITY STUDY	
STABILIZE SLOPES	
COVER/CONTOUR SLOPES	
CONSTRUCT DIVERSION DITCHES	
CONSTRUCT SPILLWAY	
RECLAIM QUARRIES (the unit cost is inclusive of backfill, compaction and scarification with a dozer)	
GRADING AND CONTOURING SIGNIFICANTLY DISTURBED AREAS (the unit cost is inclusive of backfill, co	
FLOOD PIT-Captital	
FLOOD PIT-Annual Cost	

Number of years of pump flooding

1 **Rock Pile Name:** **Mine Site Waste Rock Pile**

ACTIVITY/MATERIAL	Notes	Units	Quantity	C C
STABILIZE SLOPES				
COVER ROCK PILE				
VERY LOW PERMEABILITY COVER (in addition to above)				
CONSTRUCT DIVERSION DITCHES				
CONSTRUCT SEEPAGE COLLECTION POND				
INSTALL GROUNDWATER COLLECTION SYSTEM				
RELOCATE DUMPS				
SPECIALIZED ITEMS				
TREAT ROCK PILE SEEPAGE - see "Water Management"				
HEAP LEACH SEEPAGE TREATMENT - Cyanide Detox				
Number of years of treatment		years		An
HEAP LEACH SEEPAGE TREATMENT - ARD/ML**				
Upgrade/modify pumping system - report to WTP		allow		#

* For construction of passive treatment system refer to "Water Management". ARD/ML seepage treatment become

**Heap leach ARD/ML seepage treatment becomes post-closure water treatment cost

1 **Chemicals/Soil Area Name:**

Note: The procedures, equipment and packaging for clean up and removal of chemicals or contaminated s
the chemicals and their existing state of containment. Government guidelines should be consulted on an individu
should be considered very rough unless specific evaluations have been conducted.

ACTIVITY/MATERIAL	Notes	Units	Quantity
HAZARDOUS MATERIALS AUDIT			
BUILDING DECONTAMINATION & CONSOLIDATION OF HAZARDOUS MATERIALS			
HAZARDOUS MATERIALS REMOVAL			
HAZARDOUS MATERIALS			
CONTAMINATED SOILS			
CONTAMINATED SOIL REMOVAL			
CONTAMINATED SOIL VERY LOW PERMEABILITY COVER			
OTHER			
Fuel - Diesel (ML)	2022 Workplan Table 8.1	ML	6
Fuel - Jet A (ML)	2022 Workplan Table 8.1	ML	

Building / Equip Name: **Min**

ACTIVITY/MATERIAL	Notes
DISPOSE MOBILE EQUIPMENT - Unit Costs includes disassembly and decontamination required for on-site dis	
DISPOSE MECHANICAL EQUIPMENT - Unit Costs includes disassembly and decontamination required for on-	
Light Mechanical Equipment	2022 Workplan: - Communication Tower KM 108 (2022-13)
Medium Mobile Diesel Tanks	2022 Workplan: - 250,000 L Fuel Tank (2022-5, E-17) - 15, 000 L Fuel Tank (2022-10, E-33)
REMOVE BUILDINGS - Unit Costs include disassembling, removing or securing all items and load and transpor	
Modular	2022-R: - Addition of offices/trailers/buildings at 800p camp (201
ISO Shipping Containers	2022 Workplan: - Replacement of inflatable building with rigid building (2 8) - Bit Shack (Container Building) - Addition of offices/trailers at the Environment Dep. (20 18) - Enhancement of ERT training grounds (2022-17) - COVID-PCR testing lab building (2022-14)
REMOVE CONTAMINATED BUILDINGS - Unit Costs include disassembling, removing or securing all items, dec	
Modular Building Contaminated	2022 Workplan: - Washcar (bathroom) (E-10)
Fold Away Building Contaminated	2022 Workplan: - New building and expansion of Mary River HD Mainter Shop (2022-15)
BREAK FOUNDATIONS	
GRADE AND CONTOUR, GENERAL - Unit costs are inclusive of backfill, compaction and sacrfication with a do	
Grade and contour laydown areas	2022 Workplan: - Ore Stockpiling area at KM 105.5 (2022-2) - Expansion to KM 105 Equipment Laydown east (2022 - Expansion to KM 105 Equipment Laydown west (2022 - Mobile equipment laydown and tire facility (2022-4) - 470 Hillside Road (2022-6) - 510 Hillside Road (2022-6) - Bypass road from cross-cut road towards waste dump (2022-6) - Construction of a West perimeter road to bypass pit (2 6) - Expansion to the sedimentation pond at KM 105 to manage surface water runoff (2022-7) - Construction of new Sedimentation Pond SDLT-1 (202 - Expansion to the Water Treatment Plant Pad (2022-16
Grade and contour laydown areas	2022-R Workplan: KM110.5 Laydown for Mine Ops (2019-13)

Reclaim 7.0 Project: Baffinland Iron Mine (Bas

Building / Equip Name:	Milne Port	
ACTIVITY/MATERIAL	**Notes**	**Units**
DISPOSE MOBILE EQUIPMENT - Unit Costs includes disassembly and decontamination required for on-site dispos		
DISPOSE MECHANICAL EQUIPMENT - Unit Costs includes disassembly and decontamination required for on-site		
REMOVE BUILDINGS - Unit Costs include disassembling, removing or securing all items and load and transport		
ISO Shipping Containers	2022 Workplan: - Addition of offices/trailers at the Environment Dep. (2022-18) - Enhancement of ERT training grounds (2022-17)	m2
REMOVE CONTAMINATED BUILDINGS - Unit Costs include disassembling, removing or securing all items, decont		
BREAK FOUNDATIONS		
GRADE AND CONTOUR, GENERAL - Unit costs are inclusive of backfill, compaction and sacrfication with a dozer		
Grade and Re-Contour Laydown Areas	2022-R: - Construction of berm and linear steel support structure on laydown LP3 (2019-7)	m2
Grade and Re-Contour Reconciliation **(on IOL)**	2022-R: - Reconciled EBS Input 2014-2022 - IOL - Actual Disturbed Area Reconciliation - 2021 Satellite Image - IOL - Proposed Disturbed Area Reconciliation - 2022 Work Plan and Prior - IOL	m2
Grade and Re-Contour Reconciliation **(on Crown Land)**	2022-R: - Reconciled EBS Input 2014-2022 - Crown - Actual Disturbed Area - 2021 Satellite Image - Crown Land - Proposed Disturbed Area - 2022 Work Plan and Prior - Crown Land	m2
Fill application	2022 Workplan: - Third of Fill Application 2022 - Third of Fill Application 2022-R	m2
GRADE AND CONTOUR, WITH LINER - Unit costs include liner removal and disposal, backfill, compaction and sac		
Grade and Re-Contour with Liner Reconciliation **(on IOL**	2022-R: - Reconciled EBS Input 2014-2022 - Lined - IOL - Actual Lined Disturbed Area - 2021 Satellite Image - IOL - Proposed Lined Disturbed Area - 2022 Work Plan and Prior - IOL	m2
LANDFILL FOR DEMOLITION WASTE		
SPECIALIZED ITEMS		

Reclaim 7.0 Project: Baffinland Iron Mine (Bas

	Building / Equip Name:	Tote Ro
ACTIVITY/MATERIAL	**Notes**	
DISPOSE MOBILE EQUIPMENT - Unit Costs includes disassembly and decontamination requir		
DISPOSE MECHANICAL EQUIPMENT - Unit Costs includes disassembly and decontamination required for on-s		
REMOVE BUILDINGS - Unit Costs include disassembling, removing or securing all items and load and transport		
REMOVE CONTAMINATED BUILDINGS - Unit Costs include disassembling, removing or securing all items, dec		
BREAK FOUNDATIONS		
GRADE AND CONTOUR, GENERAL - Unit costs are inclusive of backfill, compaction and sacrfication with a doz		
Grade and Re-Contour Reconciliation **(on IOL)**	2022-R: - Reconciled EBS Input 2014-2022 - IOL - Actual Disturbed Area Reconciliation - 2021 Satellite Image - IOL - Proposed Disturbed Area Reconciliation - 2022 Work Plan and Prior - IOL	
Grade and Re-Contour Reconciliation **(on Crown Land)**	2022-R: - Reconciled EBS Input 2014-2022 - Crown - Actual Disturbed Area - 2021 Satellite Image - Crown Land - Proposed Disturbed Area - 2022 Work Plan and Prior - Crown Land	
Fill application	2022 Workplan: - Third of Fill Application 2022 - Third of Fill Application 2022-R	
GRADE AND CONTOUR, WITH LINER - Unit costs include liner removal and disposal, backfill, compaction and		
Grade and Re-Contour with Liner Reconciliation **(on IOL)**	2022-R: - Reconciled EBS Input 2014-2022 - Lined - IOL - Actual Lined Disturbed Area - 2021 Satellite Imag IOL - Proposed Lined Disturbed Area - 2022 Work Plan and Prior - IOL	
LANDFILL FOR DEMOLITION WASTE		
RECLAIM ROADS		
SPECIALIZED ITEMS		

Reclaim 7.0 Project: Baffinland Iron Mine (Bas

Building / Equip Name:	Mine S

ACTIVITY/MATERIAL	Notes
DISPOSE MOBILE EQUIPMENT - Unit Costs includes disassembly and decontamination required for on-site dis	
Light Mobile Equipment	2022 Workplan (E-8,19,20,21,22,24,27,29,32,30,31) 2022-R (2021-26,55,17,54,59,56,57,58,60,61,62)
Medium Mobile Equipment	2022 Workplan (E-3, 4, 5, 15, 16) 2022-R (2021-21)
Heavy Mobile Equipment	2022 Workplan (E-1,2,6,7,11,12,13,14,28) 2022-R (2021-6, 2021-40)
DISPOSE MECHANICAL EQUIPMENT - Unit Costs includes disassembly and decontamination required for on-s	
Light Equipment - Decontaminate and dispose on-site	2022 Workplan: - Dewatering Pumps (E-9) - Large Water Pump (E-23) 2022-R: - Bean model 435 Water Pumps (2021-53) - Zinex A5 Diamond Drills (2021-52)
Medium Equipment - Decontaminate and dispose on-site	2022 Workplan: - Type 3 E-House (E-26) - Type 1 E-House (E-25)
REMOVE BUILDINGS - Unit Costs include disassembling, removing or securing all items and load and transpor	
ISO Shipping Containers	2022 Workplan: - Lube/Def Container (E-18)
REMOVE CONTAMINATED BUILDINGS - Unit Costs include disassembling, removing or securing all items, dec	
BREAK FOUNDATIONS	
GRADE AND CONTOUR, GENERAL - Unit costs are inclusive of backfill, compaction and sacrfication with a do	
GRADE AND CONTOUR, WITH LINER - Unit costs include liner removal and disposal, backfill, compaction and	
LANDFILL FOR DEMOLITION WASTE	
SPECIALIZED ITEMS	

Capital Expenditures and Short Term Water Treatment identified in 'Instructions' worksheet

ACTIVITY/MATERIAL	Notes	Units	Quar
BREACH DYKE EMBANKMENT			
STABILIZE SEDIMENT PONDS/WATER MANAGEMENT PONDS			
REDIRECT RUNOFF/CONSTRUCT DIVERSION DITCHES			
BREACH DITCHES			
DECOMISSION FRESH WATER SUPPLY			
WATER CONTROL IN RECLAMATION QUARRY			
REMOVE PIPELINES			
GROUNDWATER COLLECTION SYSTEM			
CONSTRUCT CONTAMINATED WATER STORAGE POND			
CONSTRUCT PASSIVE TREATMENT SYSTEM (e.g. Constructed Wetland)			
CONSTRUCT WATER TREATMENT PLANT			

For cost of long-term/post-closure water treatment see "WATER TREATMENT" Worksheet"

Interim Care and Maintenance (5 Month duration)

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cos Cod
INTERIM CARE & MAINTENANCE				
on-site caretaker	Three caretakers for 18 months (assume 2 at 3w/1w and 1 at 2w/2w rotation). Assume 36 days of travel for each caretaker over 18-months.10-hr days.	hr		15BLS
extra personnel	Assume crew of 15 people for 56, 10-hr days, to stabalize site and equipment at both the Mine Site, and Milne Port. Blended unit rate is used to allow for different skill levels that would make up the crew.	hr		15BLS
-electrician		manmonths	0	elech
-mechanic		manmonths	0	mechh
annual fuel		litre	0	fcdh
Mobilization of Workers Required for Stabilization Period (from northern communities)	Assume two rotations per worker, 30% from northern communities and 70% from southern communities. Mobilization from the south is $85.45/person days on site, and from the north $75/person-days on site (Ref 1).	person-days		15NW
Mobilization of Workers Required for Stabilization Period (from southern communities)	Assume two rotations per worker, 30% from northern communities and 70% from southern communities. Mobilization from the south is $85.45/person days on site, and from the north $75/person-days on site (Ref 1).	person-days		15SW
Mobilization of caretakers	Assume mobilize from the north	person-days		15NW
Camp accomodations- stabilization period	15 workers for 56 days	person-days		15WA
Camp accomodations for caretakers	18 month duration full time	person-days		15WA
Equipment - site stabilizaiton	Assume 1 dozer, 56 days, 10 hr/day	hr		15BE
misc. supplies		allow		accmh
pick-up truck		each		#N/A
small dozer		allow		#N/A
small excavator		allow		#N/A
snow machine		allow		#N/A
communications		allow		#N/A
SNP/AEMP water sampling & reporting		each		15MC
geotechnical assessment		each		15GTS
environmental assessment	Assumes spending 1st year budget for this type of activity for interim care	each		RPTH
other		each		#N/A

Post-Closure Monitoring & Maintenance:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	U
MONITORING & INSPECTIONS					
COVER MAINTENANCE					
Maintenance Allowance	Short term care and maintenance	year		15MCAL	$
Repair erosion - infill gullies		allow		#N/A	
Repair erosion - upgrade diversion ditches		allow		#N/A	
Remove problem vegetation		allow		#N/A	
Repair animal damage		allow		#N/A	
Repair/upgrade access controls		allow		#N/A	
Other				#N/A	
SPILLWAY MAINTENANCE					
Repair erosion		m3		#N/A	
Clear spillway		each		#N/A	
CWTS MAINTENANCE					
Maintain flow, restore vegetation		allow		#N/A	
POST-CLOSURE WATER TREATMENT					
Short Term C&M, Closure & Post-Closure Monitoring and reporting - 2022 Increase for Water Treatment		LS	1	#N/A	
Subtotal, Annual post-closure costs					
Discount rate for calculation of net present value of post-closure cost, %				0.00%	
Number of years of post-closure activity				3	
Present Value of payment stream					

*Regulatory costs - annual reporting, management plans, progress reports etc.

Mobilization/Demobilization:

ACTIVITY/MATERIAL	Notes	Units	Qua
MOBILIZE HEAVY EQUIPMENT			
MOBILIZE MISC. EQUIPMENT			
Mobilization and Demobilization of Equipment and Materials by Sealift	2022 Workplan	LS	
MOBILIZE CAMP			
MOBILIZE WORKERS			
Mobilization of Workers Required for Reclamation	2022 Workplan	LS	
WORKER ACCOMODATIONS			
Worker Accommodation & Camp Operation	2022 Workplan	LS	
MOBILIZE FUEL			
WINTER ROAD			
DEMOBILIZE EQUIPMENT (includes disassembly, demob as well as worker accommodations and mob/demob)			
DEMOBILIZE FUEL			
DEMOBILIZE CAMP			
DEMOBILIZE WORKERS			
WINTER ROAD			

Underground Mine Name

ACTIVITY/MATERIAL	Notes	Unit	Qty	Code
CONTROL ACCESS				
REMOVE HAZARDOUS MATERIALS				
INSTALL BULKHEADS				
FLOOD MINE				
INSTALL GROUNDWATER COLLECTION SYSTEM				
SPECIALIZED ITEMS				

Reclaim 7.0 Project: Baffinland Iron Mine (Bas

Tailings Impoundment Name:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cos Cod
CONTROL ACCESS				
STABILIZE EMBANKMENT(S)				
COVER TAILINGS				
BURY PAG ROCK				
STABILIZE DECANT SYSTEM				
REMOVE TAILINGS DISCHARGE				
CONSTRUCT DIVERSION DITCHES				
FLOOD TAILINGS				
UPGRADE SPILLWAY				
CONSTRUCT SEEPAGE COLLECTION POND				
INSTALL GROUNDWATER COLLECTION SYSTEM				
SPECIALIZED ITEMS				
TREAT SEEPAGE - see "Water Management" and "Water Treatment"				
TREAT SUPERNATANT				
				Annu
Number of years of treatment		years		
				Tot

* for construction of passive treatment system refer to "Water Management"

Post Closure Water Treatment - Identified as long term/post-closure in 'Instructions' worksheet

ACTIVITY/MATERIAL	Notes	Units	Quantity	C
ADDITION OF REAGENTS TO WTP				
H2O2		kg		#
lime		kg		#
ferric sulphate		kg		#
ferrous sulphate		kg		#
flocculents		kg		#
Other				#
LABOUR AND SUPPLIES				
Annual fuel		litres		#
Annual power		kW-h		#
Electrician/mechanic to maintain treatment plant		allow		#
Equipment maintenance and parts		allow		#
Misc. supplies, hoses, tools		allow		#
Communications		allow		#
Other				#
WATER MANAGEMENT				
Water Treatment (reagents, equip Op. labour)		m3		AE
Water pumping from sumps and ponds to treatment plant		allow		AE
Annual Treatment Plant Servicing		manhours		lab
Treatment Plant Servicing Travel Allowance		visit		AE
Other				#
WTP WATER SAMPLING AND ANALYSES				
Sampling equipment		allow		#
Analyses		allow		#
Shipping to laboratory		allow		#
Reporting		allow		#
Other				#
SITE ACCESS				
Road maintenance (incl. snow removal)		allow		AE
Winter road tariff		allow		#
Truck rental		allow		#
Air support		allow		#
CONSTRUCT WATER TREATMENT PLANT				
Build treatment plant		LS		#
Treatment (hec) 19		HA		9
Build sludge containment facility		LS		#
ANNUAL ADJUSTMENT				
Short Term C&M, Closure & Post-Closure Monitoring and reporting - 2022 Increase for Water Treatment		LS	1	#

Reclaim 7.0 Project: Baffinland Iron Mine (Bas

Filter by unit

ITEM	Detail	COST CODE	UNITS	LOW $	HIGH $	SPECIFIED $
SLI Evaluated Unit Rate ($/unit) (2019)						
	Grade and Contour	20GC	m2			$1.49
	Grade and Contour With Liner	20GCL	m2			$4.12
	Fill Application	20PF	m2			$38.83
Cost for On-Site Disposal of Equipment:						
	Light Mobile Equipment	20MOL	Ea			$729.17
	Medium Mobile Equipment	20MOM	Ea			$1,162.50
	Heavy Mobile Equipment	20MOH	Ea			$2,075.00
	Other mobile equipment (reclaim conveyor)	20MOR	Ea			
	Light mechanical equipment - Decon	20LME	Ea			$1,583.75
	Medium mechanical equipment - De	20MME	Ea			$3,392.50
	Heavy mechanical equipment - Decc	20MEH	Ea			$32,950.00
	Light Tanks	20TL	Ea			$1,710.42
	Medium Tanks	20MT	Ea			$5,900.00
	Light Diesel Tanks	20LiDT	Ea			$2,950.00
	Medium Diesel Tanks	20MDT	Ea			$12,982.50
	Large Diesel Tanks	20LDT	Ea			$85,157.50
	Largest Diesel Tanks	20XLDT	Ea			137,227.5
	Misc Items (Minor)	20MEI	Ea			425.0
	Fuel tanks - Medium Mobile Diesel T	20MMFT	Ea			$8,381.25
Removal of Contaminated Buildings						
	fold away	20RCBF	m2			$114.04
	ISO Shipping Container	20RCBI	m2			$23.82
	modular	20RCBM	m2			$114.89
	soft walled	20RCBS	m2			$128.86
Removal of Buildings						
	fold away	20RBF	m2			$33.34
	modular	20RBM	m2			$47.64
	ISO Shipping Container	20RBI	m2			$23.82
	soft walled	20RBS	m2			$38.11
	water and wastewater treatment facil	20WWT	Ea			$8,775.00
Foundations						
	Precast concrete	20FC	m2			$30.86
	Slab on grade	20FS	m2			$30.00
	Timber cribbing	20TC	m2			$16.67
Reclaim roads						
	Remove bridges	20BR	Ea			$161,904.76
Specialized Items						
	Power distribution - electrical cable	20EC	m			21.3
	Electrical Cable	20EC	m			21.3
	Incinerator	20FI	Ea			7,925.0
	Potable Water	20PW	Ea			7,925.0
Blended Labour and Equip Rates (2018)						
	Blended labour rate	20BL	hr			$75.00
	Blended equipment rate	20BE	hr			$125.00
	Northern worker mobilization	20NWS	hr			$75.00
	Southern worker mobilization	20SWS	hr			$85.45

Reclaim Project:

1 Equipment Productivity Figures and Graphs have been reproduced from Caterpillar Perf

EXCAVATION

Productivity		
Machine Cat 336EL		
bucket capacity	3.16	m3
fill factor	75%	%
cycle time	45	seconds
operator skill	80%	%
machine availability	83%	%
altitude adjustment	100%	%
Hourly productivity	125.89	m3/hr

Operating Costs		
- Contractor		
Contractor hourly rate	$180.00	$/hr
Excavation cost - contractor rate	1.43	$/m3
- Owner		
ownership, daily		$/day
maintenance		$/hr
fuel		$/hr
consumables (cutters, tires)		$/hr

HAUL AND DUMPING

Productivity		
Machine Cat 770		
truck capacity	25.1	m
fill factor	80%	%
load time	6.0	mi
haul distance	1.5	km
average velocity	20.0	km
haul time + return time	9.0	mi
wait time	0.5	mi
dump time	1.0	mi
cycle time	16.5	mi
machine availability	83%	%
altitude adjustment	100%	%
	13.7	ve
Hourly productivity	88.0	m

Operating Costs		
- Contractor		
Contractor hourly rate	$225.00	$/
Haul and Dump - contractor rate	2.56	$/
- Owner		
ownership, daily		$/
maintenance		$/
fuel		$/
consumables (cutters, tires)		$/

APPENDIX C

Baffinland Iron Mines Corporation - 2022 Work Plan

APPENDIX D

Baffinland Iron Mines Corporation - 2022 Marginal Reclamation Security Estimate