Mary River Project

Type A Water Licence Application: Attachment 4: Site Specific Documents

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Baffinland Iron Mines Corporation
Attachment 4: Site Specific Documents

1. Introduction

1.1 Description and Overview

The Mary River Project is located on north Baffin Island, in the Nunavut Territory, in the Canadian arctic. One aspect of the project that is required is obtaining a Nunavut Water Board (NWB) Type A Water licence to operate. In order to do this, a Water Licence application needs to be completed and submitted to the Board so that they can exercise their powers under the Nunavut Waters Nunavut Surface Rights Tribunal Act (NWNSRTA or Act) and the Northwest Territories Water Regulations (NTWR or Regulations). As part of the application process there are certain engineering deliverables that need to be submitted. This document gives an outline of the engineering deliverable documents that fall under the heading Milne Port, Mary River Mine Site, Steensby Port and Railway.

1.2 Scope

The scope of this element of the project includes all works and/or undertakings required for the specific construction, operation, modification, maintenance and engineering of the project facilities at Milne Inlet, Mary River Mine Site, Steensby Port and the Railway. The reports which form part of this attachment principally include:

- Milne Port:
  - Milne Port Drainage System and Stormwater Management Ponds.
- Mary River:
  - Mine Site Drainage System, Stormwater and Sediment Management;
  - Waste Rock Dump Design Criteria; and
  - Mary River Slope Stability Analyses for the Waste Rock Dump.
- Steensby Port:
  - Steensby Port Drainage System, Stormwater and Sediment Management.
- Railway:
  - Mary River Project - Initial Geotechnical Recommendations Rock Fill Embankments and Overburden Cuts Mary River Railway.

1.3 Additional Information

Landfarm Locations and Applications

Proposed Landfarm locations are shown in Attachment 9 as described below:

- Milne Inlet Landfarm Location: E337597-0000-10-014-0002;
  - Please note that the Milne Inlet Landfarm location presented in the drawing listed above supersedes the proposed location outlined in the Hydrocarbon Impacted Soils Storage and Landfarm Facility Operations Maintenance and Monitoring Plan, Figure 2 (EBA, 2010) presented in Annex 5 of the Waste Management Plan.
- Mine Site Landfill and Landfarm Site Layout: H337697-4350-10-014-0001; and
- Steensby Inlet Landfill and Landfarm Site Layout: H337697-4660-10-014-0001.

All additional landfarm information will be provided prior to construction for approval as outlined in the 'Supplementary Information Requirements For Hydrocarbon-Impacted Soil Storage and Landfarm Treatment Facilities' by the Nunavut Water Board.

2. Document List

Document Title	Document Number	Description/Key Findings
Milne Port Drainage System, Stormwater and Sediment Management	H337697-6170-10-122-0001	This document establishes the criteria for the design of Milne Port stormwater management facilities and drainage infrastructure for the Mary River Project located in Baffin Island, Nunavut Canada. This document outlines the criteria and drainage standards for the Milne Port to be adopted for: • Stormwater management and sedimentation control storages; and • Stormwater diversion channels (i.e. intercepting "clean" water). The design of all stormwater management works is based on applicable parts of the latest revision of current codes, specifications, standards, and regulations. The Milne Port Stormwater Management system takes into consideration: • Surface drainage; • External surface drainage; • Runoff and sediment load estimations; • Flow estimation;

Document Title	Document Number	Description/Key Findings
		• Stormwater and sediment ponds; • Ditches; • Culvert; • Erosion control; and • Stormwater and sedimentation control which includes: sedimentation ponds, pond sizing, pond design and spillway design.
Mine Site Drainage System, Stormwater and Sediment Management	H337697-6170-10-122-0002	This document establishes the criteria for the design of the Mine Site stormwater management facilities and drainage infrastructure for the Mary River Project located in Baffin Island, Nunavut Canada. This document outlines the criteria and drainage standards for the Mary River Project Mine Site to be adopted for: • Drainage ditches for collection and handling of runoff from the Mine areas and stockpiles areas; • Stormwater management and sedimentation control storage areas; and • Stormwater diversion channels (i.e. intercepting "clean" water). The design of all stormwater management works is based on applicable parts of the latest revision of current codes, specifications, standards, and regulations. The Mine Site Stormwater Management system takes into consideration: • Surface drainage; • External surface drainage; • Runoff and sediment load estimations; • Flow estimation; • Stormwater and sediment ponds; • Ditches; • Culvert; • Erosion control; • Stormwater and sedimentation control which includes:

Document Title	Document Number	Description/Key Findings
		◆ Sedimentation ponds, pond sizing, pond ;design, spillway design; ◆ Dam classification; and ◆ IDF determination.
Waste Rock Dump Design Criteria	H337697-1130-20-122-0001	This Design Criteria identifies waste dump design for the Mary River Deposit #1 Mine. The Dump performance objectives are as follows: • Physical stability; • Maintain permafrost condition; • Encourage permafrost progression through the deposited waste material; • Avoid contaminated run-off; and • Operationally efficient and cost effective. The dump design history, Potential Acid Generation material storage, design basis, haul roads and ramps, mine equipment, pit crest setback, dump footprint, dump construction, overburden management and runoff water collection and geotechnical monitoring are discussed in detail. The document is followed by schematics that show conceptual dump construction sequence based upon 2010 AMEC design in combination with the 2009 mine development plan.
Mary River Slope Stability Analysis for the Waste Rock Dump	H337697-4210-10-124-0001	This memorandum summarizes the results of stability analysis conducted on the mine waste rock dump at the Mary River Mine Site. Stability analyses at the waste rock dump have been carried out by Knight Piesold (KP) in 2007; however, at the time these analysis were conducted, the waste rock dump was located south of its current location and had slightly different conduction. This report includes subsurface investigation which have been carried out a waste rock dump location in 2008 and 2011, and the stability analysis were recalculated in order to include the new information obtained from these investigations.
Design Basis for Runoff Management-Steensby Port	H337697-6170-10-122-0003	This document establishes the criteria for the design of Steensby Port stormwater management facilities and drainage infrastructure for the Mary River Project. This document outlines the criteria and drainage standards to be adopted for: • Drainage ditches for collection and handling of runoff from the

Document Title	Document Number	Description/Key Findings
		Steensby Port stockpiles areas; • Stormwater management and sedimentation control storages; and • Stormwater diversion channels (i.e. intercepting "clean" water). The design of all stormwater management works is based on applicable parts of the latest revision of current codes, specifications, standards, and regulations. The Steensby Port Stormwater Management system takes into consideration: • Surface drainage; • External surface drainage; • Runoff and sediment load estimations; • Flow estimation; • Stormwater and sediment ponds; • Ditches; • Culvert; • Erosion control; • Stormwater and sedimentation control which includes: sedimentation ponds, pond sizing, pond design, and spillway design; • Dam classification; and • IDF determination.
Mary River Project- Initial Geotechnical Recommendations Rock Fill Embankments and Overburden Cuts Mary River Railway	E337697-2110—15-124-0002	This document identifies the preliminary recommendation for the design of the rock fill embankments and cuts in over burden soils required for construction of a proposed railway line about 145 km long, that will carry iron ore between the Mary River Mine and Port Steensby on Baffin Island. Design recommendations for rock cuts and two tunnels, which are also required for the railway, are presented in a separate report prepared by EBA Engineering Consultants. The document compromises a site description, creep of ice rich soil, track settlements, effects of creep on culverts, cut excavations and closure.