Type 'A' Water Licence Amendment

Attachment 1: Supplementary Technical Information for Milne Port Facilities subject to this Amendment

1. Introduction

This attachment includes details of the facilities and infrastructure required for the construction, operation, modification, maintenance and engineering of the project facilities at Milne Port approved under the Early Revenue Phase (ERP) Amendment to Project Certificate No.005. The principal changes to Milne Port Facilities as a result of the ERP which are subject to this amendment include:

1.1 Increase in water demand

Additional manpower will be required to construct and operate infrastructure as described under the approved ERP. As a result of infrastructure being built at Milne Port under the ERP, additional 'Weatherhaven' tents are required to expand the Matrix Camp in order to accommodate the additional manpower. In return this will increase the water use requirements in the vicinity of Milne Port. Water will be required for domestic use as well as: to prepare construction materials for the ore dock; construction and operation of an ore stockpile, and ship loading facilities; and associated earthworks activities to construct the facilities. The additional water requirements and breakdown of allocated water was proposed under the renewal and amendment of Type 'B' Licence 8BC-MRY1314 submitted to the Nunavut Water Board (NWB) on May 14th 2014. While amendment of Type 'B' Water Licence 8BC-MRY1314 is intended just for construction, corresponding increases in personnel are anticipated to support ore transportation and stockpiling at Milne Port during operations. In order to account for these construction and operations activities, Baffinland is requesting an amendment to existing Type 'A' Water Licence 2AM-MRY1325 to authorize additional water withdrawal. Additional water withdrawal will be to support the increased domestic water consumption for the marginal increase of workforce required for ERP activities at Milne Port during operation. As a result, the amendment for the Type 'A' Water Licence 2AM-MRY1325 will consolidate under one licence all requirements for the construction and operation of the Mary River Project. Refer to **Milne Port – Early Revenue Phase – Site Layout H349000-2000-00-015-0017** for infrastructure being built under the ERP.

1.2 Increased size of sewage treatment plant:

In order to accommodate the additional workforce required for the approved ERP during construction and operation, the existing Rotating Biological Contractor (RBC) type Sewage Treatment Plant (STP) will be brought back into commission and operated in accordance with the terms and conditions of the existing Type 'A' Water Licence 2AM-MRY1325. This increase in the sewage treatment capacity for construction activities was proposed under the renewal and amendment of the Type 'B' Licence 8BC-MRY1314 submitted to the NWB on May 14th 2014. In order to account for similar surges in personnel required for ore stockpiling, increased haul traffic, maintenance activities and shipping activities during Operations, Baffinland are requesting to amend the Type 'A' Water Licence 2AM-MRY1325. The

application to amend the Type 'A' Water Licence will consolidate under one licence all requirements for the construction and operation of the Mary River Project. Refer to **Milne Port – Early Revenue Phase – Site Layout H349000-2000-00-015-0017** for location of STP's at Milne Port**.**

1.2.1 Additional Polishing Waste Stabilization Pond :

To ensure Baffinland's proactive approach to managing it impacts on the environment, an additional off-spec sewage effluent storage capacity proposed under the renewal and amendment for the Type 'B' Water Licence is requested to be developed at Milne Port. The Polishing Waste Stabilization Pond (PWSP) pond was proposed under the renewed Type 'B' Licence 8BC-MRY1314. Additional off-spec sewage effluent storage capacity will be provided in the form of a PWSP similar in design to the existing PWSP approved and constructed in 2013 at Milne Port. This additional off-spec sewage effluent storage capacity has been included in this application as a contingency if the existing off-spec sewage effluent storage capacity is not deemed sufficient based on current operations. In the event additional off-spec sewage effluent storage capacity is required at Milne Port, the effluent will be trucked to and from the facility. Refer to **Milne Port – Early Revenue Phase – Site Layout H349000-2000-00-015-0017** for location and **Milne Port – Off-Spec Effluent Pond (PWSP)- H349000-2735-10-035-0001** and **Milne Port – Off-Spec Effluent Pond (PWSP) Section & Details-H349000-2735-10-035-0002** for the sewage treatment expansion drawings**.**

Baffinland would like to note that while additional tent camps at Matrix will intensify demands on related systems during the construction phase of the ore dock, this activity is not directly required as a result of ERP development and is a function of ensuring ongoing contingency based on off-spec sewage effluent generation rates experiences in 2013, and would be a necessary contingency at the camp regardless of the changes to the project triggered by the ERP

1.3 Construction and operation of an ocean beach discharge for sewage treatment effluent to Milne Port (New) :

The proposed outfall location is north of the existing fuel farm facility and discharges to an existing drainage system approximately 100 m from Milne Inlet. The proposed outfall location is necessary for two reasons. The first reason is that the new location reduces the piping length with a direct route from the new STP to the PWSP and on land to the existing drainage into the ocean. The second reason is that the old discharge point and holding pond will be decommissioned to support the approved ERP facilities. Effluent will meet the discharge requirements set forth in the existing Type 'A' Water Licence 2AM-MRY1325**.** Although the discharge to marine water is not regulated by the NWB, this information is submitted to the Board for information. Refer to **Milne Port Site Layout H349000-2000-00-015-0002** for the effluent discharge location.

Additional details on the Sewage Treatment Plant at Milne Port, along with the proposed discharge location please refer to the Freshwater Supply Sewage and Wastewater Management Plan (BAF-PH1-830-P16-0010) Section 5.4.1 and Table 5.3 submitted with the Annual Report in March 2014.

1.4 Increase fuel storage to include marine diesel tanks:

Two additional 100,000 L marine diesel steel tanks are authorized under the ERP and will be installed at Milne Port. These steel tanks will be built as per the Fuel Storage and Distribution System Design Criteria H337697-000-50-122-0002 and Technical Specification Fuel Systems Field Erected Tanks, Piping and Equipment H337697-CM138-011000 approved under the existing Type 'A' Water Licence 2AM-MRY1325 and included in this attachment for reference**.** Refer to **Milne Port Marine Fuel Tank Farm Site Layout - H349000-2613-10-014-0004** for location.

1.5 Ore Stockpile and Sedimentation Ponds at Milne Port:

The ERP introduces shipping of iron ore from Milne Port and required the establishment of a 4 Mt stockpile. The longitudinal piles will be located adjacent to each other in two rows with each row separated into two piles. Associated runoff ponds will also be located at the ore stockpile to deal with any runoff. Refer to **Milne Port – Early Revenue Phase – Site Layout H349000-2000-00-015-0017** for location of ore stockpiles, **Ore Stockpile & Sedimentation Ponds Earthworks & Drainage – Plan & Sections H349000-2345-10-035-0001** for details of the ponds. Details of the Ore Stockpile can be seen on **Milne Port Ore Stockpiles No 1 & 2 Earthworks and Drainage – Plan H349000-2133010-035-0001**, **Milne Port Ore Stockpiles No 3 & 4 Earthworks and Drainage – Plan H349000-2133010-035-0002, Milne Port Ore Stockpiles Earthworks and Drainage – Sections Sheet 1 of 2 H349000-2133010-035-0003 and Milne Port Ore Stockpiles Earthworks and Drainage – Sections Sheet 2 of 2 H349000-2133010-035-0004** attached.

The **Civil Design Criteria -H349000-1000-10-122-0001** included in this amendment for information provides design details in section 7.4 for the Sedimentation Ponds for Ore Stockpile at Milne Port.

1.6 Revised Site Drainage:

Construction and operation of an ore stockpile and ore loading system, additional ancillary buildings and maintenance facilities required for the shipment of ore will result in changes to site drainage patterns at Milne Port. Additional ancillary buildings include dock office, stockpile e-house and ship loader e-house #1 and #2. The updated site drainage plans were submitted with the project Surface Water and Aquatic Ecosystem Management Plan (BAF-PH1-830-P16-0026) submitted to the board with the Annual Report in March 2014. Refer to **Milne Port Site Preparation – Site Layout Drainage Plan H349000-21000-10-015-0001 and Milne Port – Early Revenue Phase – Site Layout - H349000-2000-00-015-0017.**

2. Document List

The documents and drawings which provide details to support the changes identified above are listed in the table below:

Document Title	Document Number	Description
Site Layouts and Engineering Drawings		
Milne Port – Early Revenue Phase – Site Layout	H349000-2000-00-015-0017	Site Layout of the Early Revenue Phase infrastructure submitted with the Application for Renewal and Amendment to Type 'B' Water Licence 8BC-MRY1314 on May 14th 2014. Layout shows camp location, additional stockpiles, ore stockpile ponds, additional fuel storage containers, ancillary buildings, additional PWSP, ore dock and all other approved ERP facilities.
Milne Port Site Layout	H349000-2000-00-015-0002	Site Layout provided in the project Freshwater Supply Sewage and Waste Water Management Plan BAF-PH1-830-P16-0010 submitted with the Annual Report in March 2014. This layout shows the location of camp, sewage treatment, ancillary facilities and the new/proposed sewage treatment effluent discharge location for Milne Port.
Milne Port – Off-Spec Effluent Pond (PWSP)	H349000-2735-10-035-0001	The additional off-spec sewage Polishing Waste Stabilization Pond (PWSP) will be similar in design to the existing PWSP approved and constructed in 2013 at Milne Port as presented in this engineering drawing.
Milne Port – Off-Spec Effluent Pond (PWSP) Section & Details	H349000-2735-10-035-0002	Additional off-spec sewage Polishing Waste Stabilization Pond (PWSP) will be similar in design to the existing PWSP approved and constructed in 2013 at Milne Port. Section and Details provided in this drawing.
Milne Port Marine Fuel Tank Farm Site Layout	H349000-2613-10-014-0004	Milne Port Site layout with proposed location of the two approved 100,000L Marine Diesel Storage tanks.
Ore Stockpile & Sedimentation Ponds Earthworks & Drainage – Plan & Sections	H349000-2345-10-035-0001	Detailed plans and sections of the ore stockpile and earthworks and drainage are provided.
Milne Port Ore Stockpiles No 1 & 2 Earthworks and Drainage – Plan, ,	H349000-2133010-035-0001	Detailed plans and sections of the ore stockpile and earthworks and drainage are provided
Milne Port Ore Stockpiles No 3 & 4 Earthworks and	H349000-2133010-035-0002	Detailed plans and sections of the ore stockpile and earthworks and drainage are provided

Document Title	Document Number	Description
Drainage – Plan		
Milne Port Ore Stockpiles Earthworks and Drainage – Sections Sheet 1 of 2	H349000-2133010-035-0003	Detailed plans and sections of the ore stockpile and earthworks and drainage are provided
Milne Port Ore Stockpiles Earthworks and Drainage – Sections Sheet 2 of 2	H349000-2133010-035-0004	Detailed plans and sections of the ore stockpile and earthworks and drainage are provided
Milne Port Site Preparation – Site Layout Drainage Plan	H349000-21000-10-015-0001	As a result of the ERP infrastructure an updated Milne Port Site Preparation Layout Drainage drawing was provided to the NWB in the updated Surface Water and Aquatic Ecosystem Management Plan (BAF-PH1-830-P16-0026) submitted with the Annual Report in March 2014.
Design Criteria's and Technical Specifications		
Civil Design Criteria (Sedimentation Ponds for Ore Stockpile section 7.4)	H349000-1000-10-122 0001	This document provides design details for the Sedimentation ponds to be constructed at Milne Port in Section 7.4 of the Civil Design Criteria for the Mary River Project.
Design Criteria-Fuel Storage and Distribution System	H337697-0000-50-122-0002	This document establishes the basis of design for the fuel systems for the Mary River Project. Its purpose is to define the engineering standards and practices to be followed in the execution of the Fuel Systems Design and associated engineering activities. It describes the minimum requirements that will be taken into consideration during the design, selection and fabrication of all fuel system components. Application of the criteria and best practice engineering shall help deliver the following Project objectives: • Safe operations; • Uniformity of equipment and materials; • Uniformity of design documentation; • High level of piping equipment reliability; • Fit to purpose request; • Economic equipment; • Economic spares holding; • Compliance with statutory and code related requirements;

Document Title	Document Number	Description
		• Compliance with statutory environmental requirements; and • Compliance with specified process performance parameters and local operating conditions. The document lists the applicable documents and the relevant design parameters. Each of the components of the fuel storage and distribution system is then further developed.
Technical Specification- Fuel Storage and Distribution System	H337697-CM138	These documents specify the technical specification for fuel storage and distribution relative to the Mary River site. They address the following aspects: environmental protection, geotextiles, site grading, excavating trenching and backfilling, geomembrane, aggregates, corrected maximum dry density, concrete formwork, concrete reinforcement, cast-in-place concrete, metal fabrications, board insulation, valves, petroleum products, oil water separator and oil storage tank aboveground. For each of the above, both products and execution are described.

2.1 Management Plan

The management plans submitted to the Board for approval on March 31, 2014 already take into account the above installations. No revisions to the management plans are required.

For additional details on the Sewage Treatment Plants at Milne Port, along with the sewage effluent discharge locations please refer to the Freshwater Supply Sewage and Wastewater Management Plan (BAF-PH1-830-P16-0010) Section 5.4.1 and Table 5.3 submitted in with the Annual Report in March 2014.

For additional details on surface water management and drainage please refer to the updated Surface Water and Aquatic Ecosystem Management Plan (BAF-PH1-830-P16-0026) submitted with the Annual Report in March 2014.

Details on additional fuel storage requirements at Milne Port please refer to the ERP Addendum to the FEIS Volume 3, Section 2.5.1 and Table 3-2.2 which provides a summary of the estimated Diesel consumption for the first five year.