July 14, 2021

Karen Costello
Nunavut Impact Review Board
P.O. Box 1360
Cambridge Bay, NU
X0B 0C0

Re: 2021 Marine Shipping and Vessel Management Report, including Follow-up to Preliminary Summary of 2020 Narwhal Monitoring Programs

Dear Ms. Costello,

Please find attached Baffinland Iron Mine Corporation's ("Baffinland") 2021 Marine Shipping and Vessel Management Report ("the Report"), as required to reflect the approved changes and activities associated with the Production Increase Proposal Extension Request (the 'Project'). In addition to the information outlined for inclusion in Section 3.1 of Project Certificate 005, this year's submission also includes a 2021 Narwhal Adaptive Management Response Plan (NAMRP), as committed to through Baffinland's responses to written comments received on the Preliminary Summary of 2020 Narwhal Monitoring Programs ("the Preliminary Summary").

Baffinland has worked diligently since the release of the Preliminary Summary to engage Intervenors, and respond in a meaningful way to the questions, comments and recommendations it has received. The 2021 NAMRP reflects the culmination of these activities, as well as Baffinland's commitment for implementing precautionary mitigation measures that factor in the direct input of Inuit, and other Project stakeholders, in particular those representing the community of Pond Inlet. **Importantly, Baffinland has elected to strengthen the mitigation measures for the 2021 shipping season in direct response to Inuit input and the recognition of an important community project occurring (i.e., construction of the small craft harbour) which overlaps with the planned start of the Baffinland shipping season. In an effort to reduce potential cumulative impacts of the Project to narwhal during this sensitive time period, Baffinland aims to further reduce potential impacts by electing to delay the start of the shipping season until ice-breaking is no longer required for vessels transiting towards Milne Port.** A brief summary of Baffinland's engagement efforts and planned mitigations for 2021 are provided below, and explained in more detail in the Report.

Engagement with Inuit, Regulators and Other Interested Parties

On April 7, 2021, in advance of what was expected to be the final Public Hearing on Baffinland's Phase 2 Proposal, Baffinland released a Preliminary Summary of 2020 Narwhal Monitoring Programs (the 'Preliminary Summary'), as well as a covering letter providing an overview of the key findings and proposed monitoring and mitigation plans for the 2021 shipping season. Acknowledging the relevance of

the Preliminary Summary to the on-going assessment of the Phase 2 Development proposal, the Nunavut Impact Review Board (NIRB) directed Parties to submit written comments by May 17, 2021 and for Baffinland to respond by June 4, 2021.

During the review and response period, Baffinland engaged with Intervenors both individually, and as a collective through the Marine Environment Working Group (MEWG). Two meetings of the MEWG were held where the Preliminary Summary was discussed, the first being a dedicated meeting that took place on May 13, 2021, and the latter being a regularly scheduled meeting on June 29, 2021. Additionally, on May 13, 2021 Baffinland supplemented the Preliminary Summary with the distribution of the DRAFT 2020 marine monitoring reports to the MEWG.

As part of Baffinland's responses to comments, submitted on June 4, 2021, a commitment was made to develop and submit a formal adaptive management response plan to the NIRB prior to the commencement of the 2021 shipping season, and that relevant Parties would be directly engaged in the development of this Plan. Between June 17, 2021 and June 26, 2021, the draft 2021 NAMRP (included in this submission as Appendix D to version 8 of the Shipping and Marine Wildlife Management Plan) was shared with the following organizations for review and comment, as well as an invitation to meet for further discussion:

- Fisheries and Oceans Canada (DFO);
- Qikiqtani Inuit Association (QIA);
- Hamlet of Pond Inlet (the 'Hamlet'); and
- Mittimatalik Hunters and Trappers Organization (MHTO).

Of the organizations listed above, DFO and the Hamlet agreed to meet with Baffinland for further discussion, and the Hamlet and the MHTO provided written feedback directly to the NIRB between June 25, 2021 and June 28, 2021. The recommendations received through the written comment period, as well as the above mentioned meetings and written feedback were critical for consideration during development of the final 2021 NAMRP.

All engagement activities are described in the 2021 Marine Shipping and Vessel Management Report and the final 2021 NAMRP. Copies of letters issued directly to communities have also been attached to the Marine Shipping and Vessel Management Report for reference.

2021 Mitigation and Monitoring

In the April 7, 2021 covering letter to the Preliminary Summary, Baffinland committed to taking a precautionary approach and modifying its shipping activities on an interim basis for 2021. Specifically, Baffinland proposed to delay shipping until the opening of a continuous path of less than 9/10ths ice concentrations between the entrance of Eclipse Sound and Milne Port. This decision was made recognizing the value of the Eclipse Sound narwhal stock to the residents of Pond Inlet, and that there are unknown and/or unmitigated cumulative activities occurring in the Marine Regional Study Area (RSA) that

are likely to continue in 2021. This mitigation is consistent with Option 2 from the Preliminary Summary, which was one of the most precautionary options identified.

Through written comments and meetings with the MEWG and individual Intervenors, Baffinland received several recommendations and requests to implement even stronger mitigations than what was already proposed on April 7, 2021. Through development of the 2021 NAMRP, **Baffinland considered each request carefully and is electing to avoid icebreaking for the Spring of 2021. Operationally, the trigger to commence the beginning of the 2021 shipping season will be the presence of a continuous path of 3/10ths or less ice concentrations between the entrance of Eclipse Sound and Milne Port**. Based on historical ice conditions, waiting for a continuous path of 3/10ths or less ice concentrations represents an approximate 2-week delay from when landfast ice would otherwise be completely broken across the Northern Shipping Route and normal shipping operations would regularly commence.

There is a strong basis for the use of 3/10ths or less ice concentrations as a measure to avoid icebreaking as it is described by Transport Canada as 'very open drift' where "water dominates over ice". For the purposes of implementing Baffinland's transit restriction system and reducing potential noise disturbance to narwhal in both 2019 and 2020, 3/10ths or less ice concentrations is the conditional requirement for allowing regular shipping operations to begin on the basis that ice can generally be avoided. While the icebreaker, MSV Botnica, will still be present during the shipping season, and continue to be available for escorts as a precaution, vessels may not require it to register positive ice numerals to enter the area by Transport Canada. Note that shipping operations will continue as in previous seasons into the Fall, inclusive of some icebreaking activity.

Further details and information related to ice conditions and Baffinland's planned shipping activities are included in the 2021 NAMRP.

Commitment to Adaptive Management and Inuit Input

In making the decision to further delay the 2021 shipping season, the feedback provided by organizations representing Pond Inlet was crucial. Baffinland understands the importance of narwhal to Pond Inlet, as well as the completion of the Small Craft Harbour. Without knowing what, if any, additional mitigations will be placed on the construction activities associated with the Small Craft Harbour in 2021, Baffinland is committed to modifying its own activities in the Regional Study Area (RSA) for the benefit of Pond Inlet, and for the integrity of the Eclipse Sound summer narwhal stock.

The decision to further delay shipping in 2021 is not without significant risk to the operation and the ability to transport this year's planned 5.75 Mt of iron ore from Milne Port. The current outlook on summer ice conditions along Baffinland's approved Northern Shipping Route indicates a heavier ice year than experienced in 2020, with Baffin Bay total ice coverage looking more similar to 2018. The consequences of losing tonnage this year are amplified by the fact that Baffinland is in the process of implementing significant cost restructuring measures aimed at repaying debt and lowering the financial exposure of the operation, understanding that the Mary River Project, in its current configuration, is not feasible at lower

iron ore prices forecasted for 2022 and beyond, as previously made public on April 30, 2021. This decision is also being made while continuing to recover from impacts to the operation due to COVID-19, and in the face of continued regulatory uncertainty, and on the premise.

Baffinland accepts the risks of a delayed shipping season in 2021 because it is committed to listening and responding to the concerns and priorities of the community of Pond Inlet, which most closely experiences consequences of potential Project-related and cumulative effects. As previously indicated, Baffinland is implementing additional mitigations in 2021 as a precaution, without the benefit of completing an additional investigation into the 2020 monitoring results and establishing causality. The arctic marine environment is dynamic and influenced by many factors, and understanding the interactions that occur within it requires the expertise of multiple parties, and multiple years of study. Baffinland's 2021 mitigations do not attribute causality of observed changes in narwhal abundance to Baffinland operations.

Baffinland appreciates the time and effort dedicated by Intervenors for participating in the Preliminary Summary review process. Through this contribution, Baffinland has developed a strong response to its 2020 narwhal monitoring program findings for implementation during 2021 shipping operations, clearly demonstrating a sincere, rapid and flexible commitment towards operating in a protective, precautionary and adaptive manner.

Regards,

Lou Kamermans
Senior Director, Sustainable Development
Baffinland Iron Mines Corporation

Cc: Tara Arko, NIRB
Guillaume Daoust, NIRB
Cory Barker, NIRB
Joshua Arreak, Hamlet of Pond Inlet
Enookie Inuarak, MHTO
David Lee, NTI
Thomas Hoggarth, DFO
Natalie O'Grady, Government of Nunavut
Jared Ottenhof, QIA
Megan Lord-Hoyle, Baffinland

Attachments

Attachment 1: 2021 Marine Shipping and Vessel Management Report to the NIRB

ᓂᐅᕐᑎᓂᖅ 14, 2021

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ᐱᔨᔪᑎᒋᖅ: 2021-ᒥ ᑕᓚᐅᖅᑯᑦ ᐅᓯᖅᑕᕋᓂᖅ ᐅᒥᐊᕐᕕᐊᓂᔪᓗ ᐊᐅᒋᕐᑎᓂᕐᓄᑦ ᐅᓂᖅᑲᖅ, ᐱᕆᓯᐅᕐᓴᔪᒍ ᐃᒋᕐᐊᕋᖅᑐᖅ ᐱᕈᐊᑭᑎᒧᑦ ᓇᐃᓐᓇᖅᑐᓄᑦ 2020-ᒥ ᕿᑭᒋᓚᓗᓄᑦ ᖃᐅᔨᓴᕐᓂᓄᑦ

ᒥᔪ ᑲᓴᑎᐊᔨᖏᓚᐃᑦ,

ᑕᑯᔪᖅ ᐊᑕᐅᖅᑲ ᐊᓂᓐᓂᑲᑎᓄᑦ ᐅᓴᖅᓂᓂᐊᖅᐸᓕᕐᑕ ᑯᐊᐳᓵᓴᖏᑕ (ᐊᓂᓐᓂᓇᓂᑯᑦ) 2021-ᒧᑦ ᑕᓚᐅᖅᓂ ᐅᒥᐊᕐᕕᐊᓂᑯᑦ ᐅᓯᖅᑕᕋᓂᖅᓂᓄᑦ ᐅᒥᐊᕐᕕᐊᓂᔪᓗ ᐊᐅᒋᕐᑎᓂᕐᓄᑦ ᐅᓂᓂᒃᖏᖅᑐᑦ (ᐅᓂᓂᒃᖅ). ᖃᓄᖅᓂᓂᐊᔪᑦ ᐅᖅᑲᐅᓯᐅᕕᓄᑦ ᐃᒋᓕᐅᕐᓴᐅᓂᖏᓚᓂᑦ ᐊᕐᓴᓯᒪᕕᖅ 3.1 ᐱᓕᓚᓂᖓᒧᑦ ᐱᕕᓂᐅᐅᑎᒧᑦ ᓇᐃᓴᐅᑎᓕᓐᓄᒧᑦ 005, ᑕᕐᕉᓴᓚ ᐊᖅᑳᒍᒧᑦ ᐅᓂᓂᒃᑐᓕᐊᖅ ᐱᖅᓯᐅᓴᕕᖅ 2021ᒥ ᕿᑭᒋᓚᓗᓄᑦ ᐋᖅᑭᑎᐊᑭᓐᓇᖅᑐᒃ ᐊᐅᒋᕐᑎᓂᕐᓄᑦ ᖃᓇᐃᑎᐊᖅᓂᓂᕐᓄᑦ ᐸᖅᓇᐅᑎᒥ, ᐊᓕᕐᖅᓯᒪᓕᓴᓚ ᒪᑕᒍᓗᑐᓂᒃ ᐃᓕᓴᕐᓂᖅᑐᑦ ᐃᓕᓴᕐᓂᖅᑐᑦ ᐊᐅᒋᕐᑎᓂᕐᓄᑦ ᐸᖅᓇᐅᑎᒥ ᐸᖅᑲᐅᖅᑯ

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ᐊᐃᖏᕆᓂ 7, 2021-ᒥ, ᓱᕐᓂᐊᓂ ᑭᖑᓪᓕᖁᓪᓗᑦ ᐃᓄᓕᒫᖁᑎᑕᓂᖅ ᓀᵒᓇᓱᑎᓕᐅᖁᑕᕐᑎᵒᓄᑦ ᐸᕐᵒᒋᵒᔨᑦ ᐱᓕᕆᓂᐅᕐᓴ ᒪᖁᑕᐊᓄ ᐱᔪᒪᓇᓱᑎᒍᑦ, ᐸᕐᵒᒋᵒᔨᑦ ᓴᖁᑭᑎᓕᐅᖁᑐᑦ ᐱᑎᐊᑕᑎᒥᑦ ᐃᓇᐊᕐᑐᖁᓂᒃ 2020-ᒥ ᖃᐅᓪᓚᕆᓄᑦ ᖁᑎᐅᓴᖁᓂᓂᑦ (‘ᐱᑎᐊᑕᑎ ᐃᓇᓀᖁᓱᔪᓂ’), ᐱᖁᑎᐅᖏᓪᓗᒍ ᑎᑎᕋᖅ ᐅᖁᑎᐅᓱᓕᐅᑐᒃ ᐃᓗᐃᑦᑐᑦᑐᑦ ᖁᑎᐅᓴᕐᐅᔪᓂᒃ, ᖁᑎᐅᓴᖁᑕᐅᔪᒪᔪᓂᓪᓚᓗ ᐱᐅᖏᑦᑐᓗᓀᓪᓗᒍ ᒥᑭᑕᐊᑎᑕᐅᓀᓂᒃ ᐸᖁᓇᑕᐅᑕᕐᑐᐅᔪᒪᔪᓀᓂ 2021ᒥ ᐅᒥᐊᖏᐊᓂᑦ ᐅᓱᑲᓕᕐᓂᖓᓐᓂ. ᑐᑭᓱᓪᓚᐅᑉᐳᒃ ᐊᐃᑎᖁᑎᓂᖅᓱᓐ ᐱᑎᐊᑕᐅᓪᓗᑦ ᐃᓇᐊᕐᑐᖁᓂᓄᖅ ᐅᖁᑎᐅᓴᓂᒃ ᐸᕐᒥᖁᑭᓂᓂᑦ ᐱᓕᕆᓂᐅᕐᓴ ᐱᔪᒪᓇᓱᑎᒍᑦ, ᓄᓇᕗᒥ ᐊᐸᑎᓕᓚᐅᑦᑐᓂᑦ ᐃᓄᖅᓂᓚᓗᒍᑦ ᐱᑎᐊᑕᐅᓪᓗᑦ ᐃᓕᐅᖁᑕᐅᔪᓂᒃ ᐊᐃᑎᖁᑎᓂᖅᓱᓐ ᑐᑭᓱᓪᓚᐅᑉᐳᒃ ᐊᐃᑎᖁᑎᓂᖅᓱᓐ ᐅᖁᑎᐅᓴᖁᓂᓂᑦ ᐃᓇᐊᕐᑐᖁᓂᓄᖅ

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ᐊᐃᖏᕆᓚ 7, 2021ᒥ ᑎᑎᕀᖅ ᐱᒥᐊᑭᑎᓄᓂ ᓇᐃᓇᖅᓯᒪᔪᓂᒃ, ᐸᓴᐅᓪᓕᐅᖅᑐᓂ ᐊᖏᕐᕋᓕᐅᕐᓚᒪᑦ ᐱᓴᓕᓂᓴᓕᓚᓕᓪᓚᑎᑦᑐᑎᓪᓗ ᐅᒥᐊᖏᕐᕕᒃᑯᑦ ᐅᓱᖅᑕᕐᓂᖅᓄᑦ ᐃᓴᐅᓚᐅᑲᒃᓴᑦ 2021–ᒧᑦ. ᐱᓗᐊᖅᑐᒥᒃ ᐸᓴᐅᓪᓕᐅᖅᑐᓂ ᐱᔪᓚᓚᐅᑲᒃᑯᑦ ᐅᒥᐊᖏᕐᕕᒃᑯᑦ ᐅᓱᖅᑕᕐᓂᖅᓄᑦᑐᑦ ᐃᓴᐅᓚᐅᑲᒃᑯᑦ ᐅᓱᖅᑕᕐᓂᖅᓄᑦᑐᑦ ᐊᐃᖏᕆᓚ 9/10 ᓱᑯᖅᖏᑦᓯᓂᑦ ᐃᓱᓚᐊᖅᓂᑦ ᑕᓱᐅᕆᓂᑦ ᖃᖅᖏᒪᐊᓂᑦ. ᒐᓴᓗ ᖃᓄᖅᑐᑦᑕᐅᓚᐅᖅᑐᑦᑕᒃ ᐃᑕᓴᓚᑦᓯᑎᑦ ᑕᓱᐅᕆᓂᑦ ᒥᑎᒪᑕᓚᖓᐅᐅᓂᑦ, ᓇᓯᓴᐅᔪᓂᓪᓗ ᐱᐅᖏᕐᕕᓂᑦ ᒥᑭᓚᒥᐊᖅᓱᒪᖏᕐᕕᑦᑕᕐᕆᓕᑦ ᑲᑎᕐᕕᐅᔪᓂ ᑕᓚᐅᖅᓂ ᖃᖅᑲᐅᓴᖏᓂᕐᓂᓪᓗ ᐱᐅᖏᕐᕕᓂᑦ ᒥᑭᓚᒥᐊᖅᓱᒪᖏᕐᕕᑦᑕᕐᕆᓕᑦ ᑲᑎᕐᕕᐅᔪᓂ ᑕᓱᐅᕆᓂᑦ ᖃᖅᑲᐅᓴᖏᓂᕐᓂᓪᓗ ᐱᐅᖏᕐᕕᓂᑦ ᒥᑭᓚᒥᐊᖅᓱᒪᖏᕐᕕᑦᑕᕐᕆᓕᑦ ᑲᑎᕐᕕᐅᔪᓂ ᐅᓂᒃᑲᒥ ᐊᐃᖏᕆᓚ ᐱᐅᖏᕐᕕᒃᑯ

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Baffinland

2021 Marine Shipping and Vessel Management Report

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July 14, 2021 | ᕿᓪᐃ 14, 2021

Baffinland Iron Mines Corporation

Mary River Project

MARINE SHIPPING AND VESSEL MANAGEMENT REPORT TO THE NUNAVUT IMPACT REVIEW BOARD

2021-07-14	Emma Malcolm	
	E. Malcolm	L. Kamermans
Date	**Prepared By**	**Approved By**

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ABBREVIATIONS

AIS	Automatic Identification System
AiS	Aquatic Invasive Species
Baffinland	Baffinland Iron Mines Corporation
ERP	Early Revenue Phase
EWI	Early Warning Indicator
FEIS	Final Environmental Impact Statement
HTO	Hunters and Trappers Organization
IIBA	Inuit Impact and Benefit Agreement
MEEMP	Marine Environmental Effects Monitoring Program
MEWG	Marine Environment Working Group
MHTO	Mittimatalik Hunters and Trappers Association
MTPA	Million Tonnes Per Annum
NIRB	Nunavut Impact Review Board
NIS	Non-Indigenous Species
NLCA	Nunavut Land Claim Agreement
RSA	Regional Study Area
SSA	Stratified Study Area
the Project	Mary River Project
QIA	Qikiqtani Inuit Association

1 INTRODUCTION

1.1 BACKGROUND

As part of the approval to extend the shipping of 6 million tonnes per annum (MTPA) through Milne Port and newly amended Project Certificate No. 005 (Amendment 003, dated June 18, 2020), Baffinland Iron Mines Corporation (Baffinland) is required to submit a Marine Shipping and Vessel Management Report (the Marine Shipping Report) to the Nunavut Impact Review Board (NIRB) prior to the commencement of the shipping season informing the Board of six key components, as described in Table 1.1.

Table 1.1: Marine Shipping Report Components

Report Component	Report Section
Anticipated number of ship transits along the approved shipping route	Section 2
Identification of specific areas to be used for drifting and anchorage of vessels with details of how community feedback and comments from the Marine Environment Working Group (MEWG) has been used to inform the selection of suitable areas	Section 3
Timeline for organizing pre- and post-shipping meetings with the community	Section 4
Plans for preventing or mitigating vessel interference with marine mammals and traditional hunting activities pursuant to term and condition 125(a) of the Project Certificate;	Section 5
Evidence of community involvement to review preliminary results of the monitoring programs, and to compare results with experiences of community members and hunters with respect to the marine environment and marine mammals during the shipping season;	Section 6
Evidence of reporting new or non-native species identified as a result of Aquatic Invasive Species monitoring, to MTHO and DFO with confirmation of whether or not this species had been observed in the past or through other community or regional monitoring initiatives.	Section 7

Subsequent sections will provide additional details to support information requirements associated with components listed in Table 1.1.

2 2021 SHIPPING OPERATIONS

2.1 2021 SHIPPING OPERATIONS

In 2021, Baffinland is planning to ship between 5 and 6 million tonnes of iron ore over the shipping season along the Northern Shipping Route (see Figure 2.2). The first vessels are anticipated to enter the Regional Study Area (RSA) between July 26 and August 1, subject to prevailing ice conditions. Vessels will not enter the RSA until a continuous path along the Northern Shipping Route of 3/10ths ice concentrations or less is confirmed. Additionally, Baffinland will seek written confirmation from the Mittimatalik Hunters and Trappers Organization (MHTO) that the floe edge has been closed to hunters. Vessels will hold at least 40 km to the east of the RSA until they are approved by the Port Captain to enter and sail towards Milne Port (see Figure 2.3).

Vessels traveling to and from Milne Port in 2021 will consist of an icebreaker (MSV Botnica), tugs, ore carriers, cargo sealifts and fuel tankers.

Table 2.1: Definitions

Term	Definition
Voyage	The two-way movement of one vessel into and out of Milne Port.
Transit	The one-way movement of one vessel or two or more vessels in a convoy inbound or outbound to/from Milne Port but only for the purpose of/under transit restrictions (i.e., 24-hour time restrictions). A convoy may be treated as a single convoy. A single vessel travelling one-way through the RSA will always be treated as a single transit. Tug activity is excluded when remaining within Milne Port.
Convoy	The movement of one or more vessels at the same time into or out of Milne Port during either escort or instructed to travel as a group (currently only occurring under ice conditions that require it).

Table 2.2: Anticipated Vessel Transits in 2021

Vessel Type	Anticipated Number of Voyages to and from Milne Port	Anticipated Number of Transits	Note
Icebreaker (MSV Botnica)	Early shoulder season: 1 * Fall Shoulder season: 1 to ~15	Early shoulder season: 1* Fall Shoulder season: 2 to ~30	The icebreaker will be present at the beginning of the shipping season, despite plans to avoid icebreaking. The icebreaker will continue to be available for escort as a precaution, if required by a vessel owner. The Botnica may also provide emergency response support, if required and will continue participation in the Marine Mammal Observer Network program while transiting along the Northern Shipping Route. At the end of the shipping season, the icebreaker will be required to support safe passage of ore carriers as freeze up along the Northern Shipping Route begins. The number of transits are subject to prevailing ice conditions and the number of vessels requiring escorting (convoy scenario) during observed ice

Vessel Type	Anticipated Number of Voyages to and from Milne Port	Anticipated Number of Transits	Note
			conditions. Icebreaker operations are limited to when escort of vessels is required.
Tugs	2	4	Tugs will travel to Milne Port, and will remain for the entire shipping season to support ore carriers anchoring and berthing at the Port..
Ore Carriers	72 to 76	144 to 152	Baffinland is aiming to ship between 5 to 6 million tonnes of iron ore in 2021.
Resupply Cargo Vessel	4	8	Cargo vessels may be serving other Nunavut communities either before or after delivery to Baffinland. In 2021, some cargo vessels may be employed for the purposes of backhauling equipment from site.
Fuel Tanker	3 to 4	6 to 8	Fuel tankers may be serving other Nunavut communities either before or after delivery to Baffinland.

Figure 2.1: Tug Support for the Ore Carriers at Milne Port

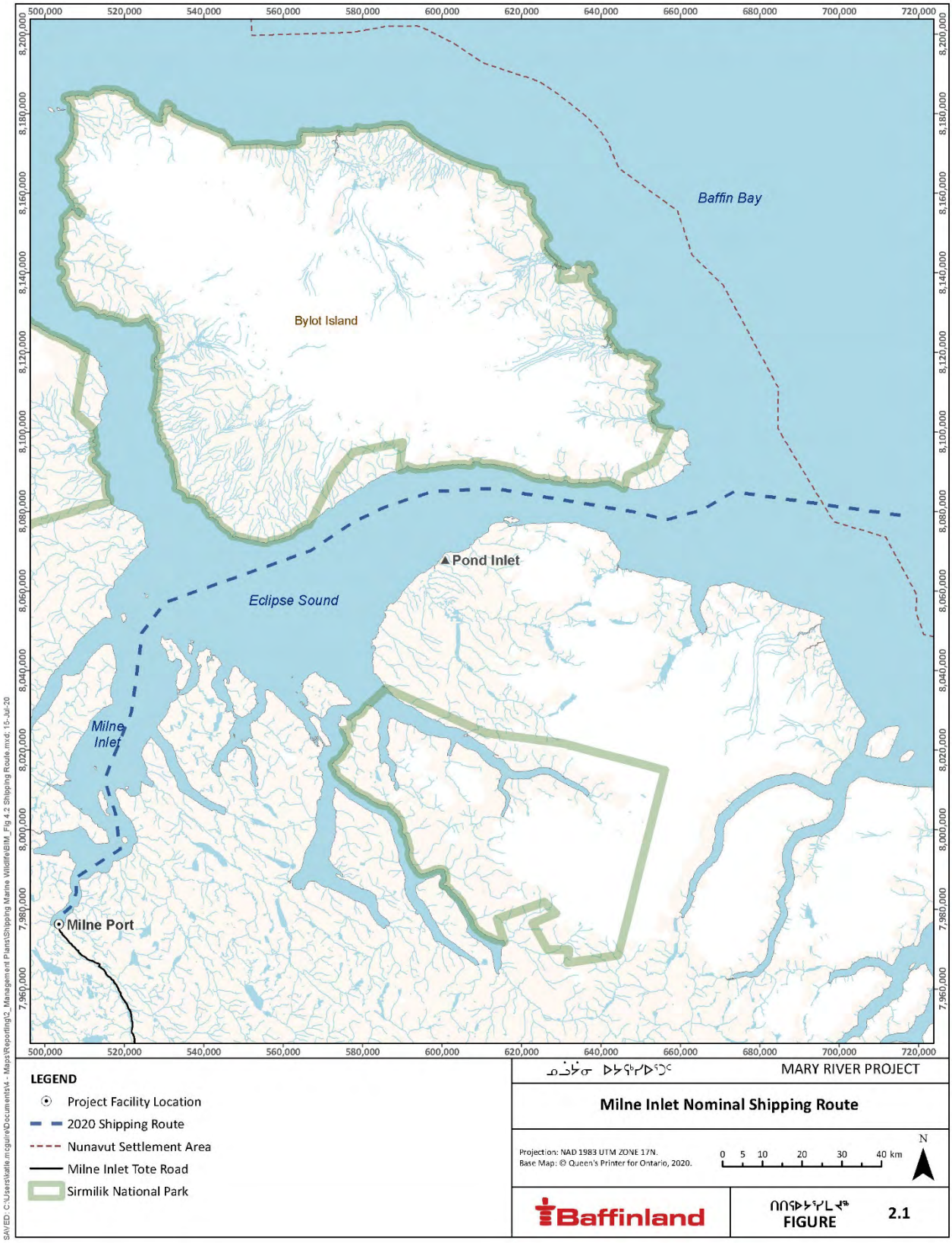

Figure 2.2: Milne Inlet Nominal Shipping Route

Figure 2.3: Shipping Route Buffer Zone

3 ANCHORING AND DRIFTING AREAS

3.1 CONTEXT

NIRB has requested that Baffinland identify the specific areas to be used for drifting and anchorage of vessels and also to provide details of how community feedback and comments from the Marine Environment Working Group (MEWG) has been used to inform the selection of suitable areas.

3.2 2021 ANCHORING AND DRIFTING AREAS

As a critical component to the safety and efficiency of Baffinland's marine operations, two primary locations for anchoring in the RSA will continue to be used in 2021. Vessels waiting for an anchor at Milne Port will continue to anchor to the west of Ragged Island in North Milne Inlet and vessels undergoing cargo inspections and ballast water testing will anchor within the vicinity of Milne Port prior to birthing at the Ore Dock (Figure 3.1).

3.2.1 Community Engagement and Feedback

In 2020, Baffinland undertook an options exercise of five alternative locations proposed by the MHTO for anchoring along the Northern Shipping Route. The results of this alternative options exercise confirmed that the established anchorage locations near Ragged Island remain the most suitable for the Project. A memo summarizing the options exercise was provided to the North Baffin Hamlet and Hunters and Trappers Organizations (HTOs) on January 13, 2020 (NIRB Registry No. 330789).

During Baffinland's 2021 Pre-Season Shipping Meeting the MHTO confirmed that it is still their preference for Baffinland to avoid anchoring anywhere within the RSA outside of Milne Port. Baffinland reiterated its position that the existing Ragged Island anchorage locations are most suited for the safe and efficient management of vessel loading at Milne Port, which is critical to ensure success of the Project. Throughout 2021, Baffinland will continue to minimize impacts on hunters and those traveling on water by enforcing that no more than three ore carriers can anchor or drift in the Ragged Island area at any time. Baffinland also commits to avoiding any Baffinland-contracted vessels from drifting in Eclipse Sound, unless warranted for safety considerations. Ore carriers are also prohibited from discharging ballast water at the Ragged Island anchorage locations. Furthermore, all ore carriers are prohibited from discharging grey water and sewage throughout the RSA.

Baffinland remains open to working with Pond Inlet on exploring feasible alternatives or modifying current practices further for anchoring at Ragged Island to minimize interference of shipping on land users.

3.2.2 Marine Environmental Working Group

No comments on Baffinland's anchorage locations or management practices were raised by the MEWG during the May 13 or June 29, 2021 pre-shipping season MEWG meetings.

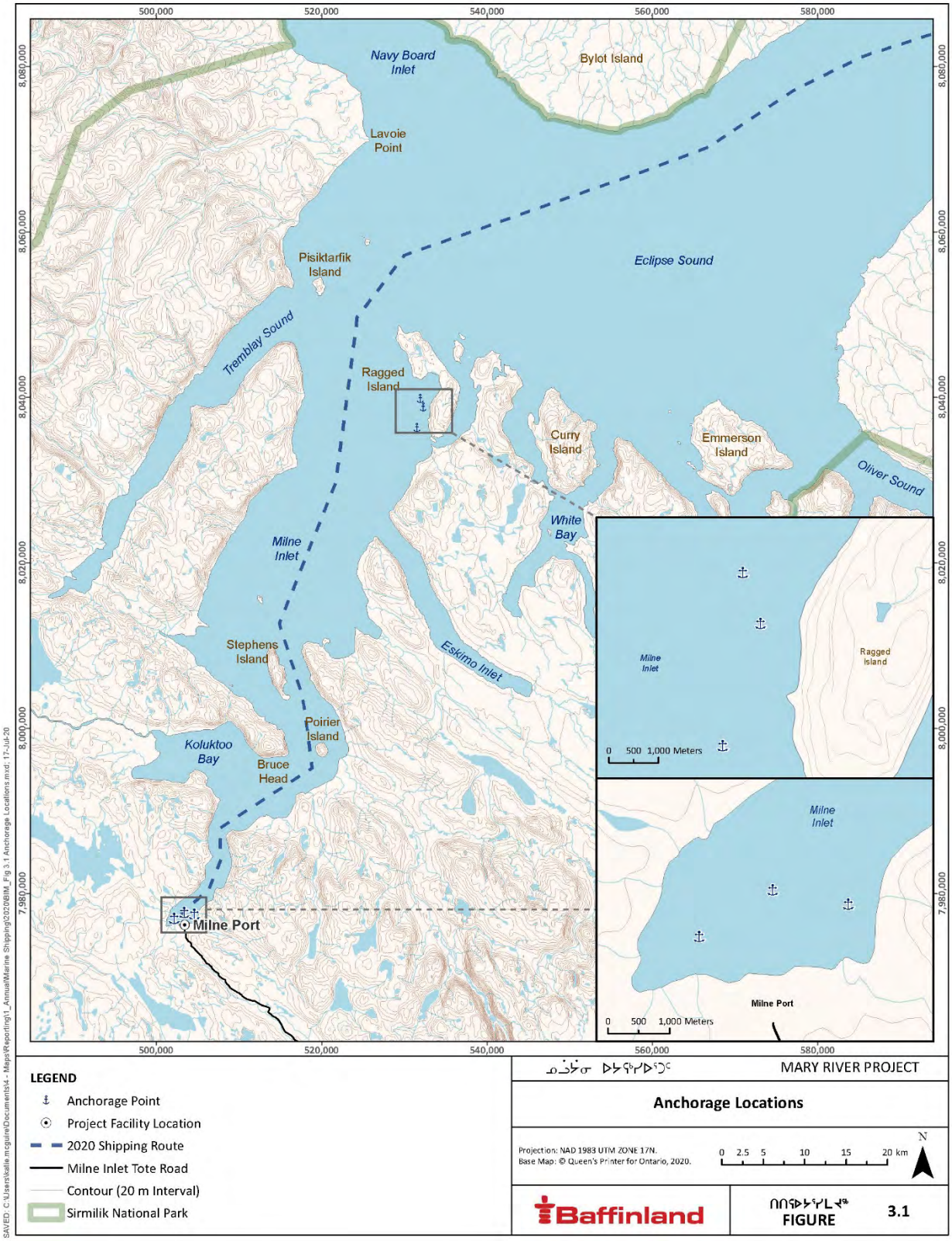

Figure 3.1: Anchorage Locations

4 SHIPPING ACTIVITY-RELATED COMMUNICATIONS

4.1 CONTEXT

As part of its regular operation, Baffinland has as Shipping-related Communications Protocol to guide specific engagement activities with the MHTO and Hamlet of Pond Inlet. As part of this protocol, Baffinland hosts pre and post shipping season meetings. Baffinland also maintains a number of communication and engagement activities throughout the shipping season. A summary of the key activities is summarized in Table 4.1 below.

Table 4.1: Key Components of Shipping-Related Communications

Timing	Key Component	Description
Pre-season	Pre-Shipping Season Meeting	Baffinland to host a Pre-Shipping Season Meeting with representative of MHTO, the Hamlet of Pond Inlet and the QIA.
	Confirmation of floe edge closure	Baffinland to obtain written confirmation from the MHTO that the sea ice is no longer being used by hunters (i.e., floe edge has been closed to hunters).
	Local radio announcement of start of shipping season	Baffinland to notify the residents of Pond Inlet of the anticipated start dates for Baffinland-related shipping activities on the local public radio.
	Official start of shipping season	Baffinland notifies the official start of the shipping season by sending a letter addressed to the MHTO, and shares letter with the Hamlet and the Pond Inlet Qikiqtani Inuit Association (QIA) representative via email.
During Shipping	Ongoing shipping activities-related communications	Baffinland maintains active communications with the MHTO and residents of Pond Inlet about ongoing shipping operations throughout the summer via multiple modes including local public radio, marine VHF radio, social media, and live ship tracking available on the Baffinland website (www.baffinland.com) under its >Operation>Shipping & Monitoring> webpage.
		Hiring of shipping monitors based in Pond Inlet
		Dedicated email address (shipping@baffinland.com) for concerns and comments directed to Baffinland
		Posting of Shipping and Marine Monitoring Fact Sheet, including Shipping Route, in key locations in Pond Inlet (see Appendix 2).
		Maintain comment/concern tracker relevant to shipping season
Post-season	Overall shipping season summary	Baffinland to prepare a summary on all vessel-related activity
	End of Shipping Season Meeting	Baffinland to host an End of Shipping Season Meeting with representatives of MHTO, the Hamlet of Pond Inlet and the QIA. Meeting is typically held in the same year of shipping season being discussed after the last Baffinland Project vessel has left the RSA.
		Baffinland considers the potential for integrating feedback in planning of subsequent year's shipping operations, including consideration of adoption of new management and mitigation measures.

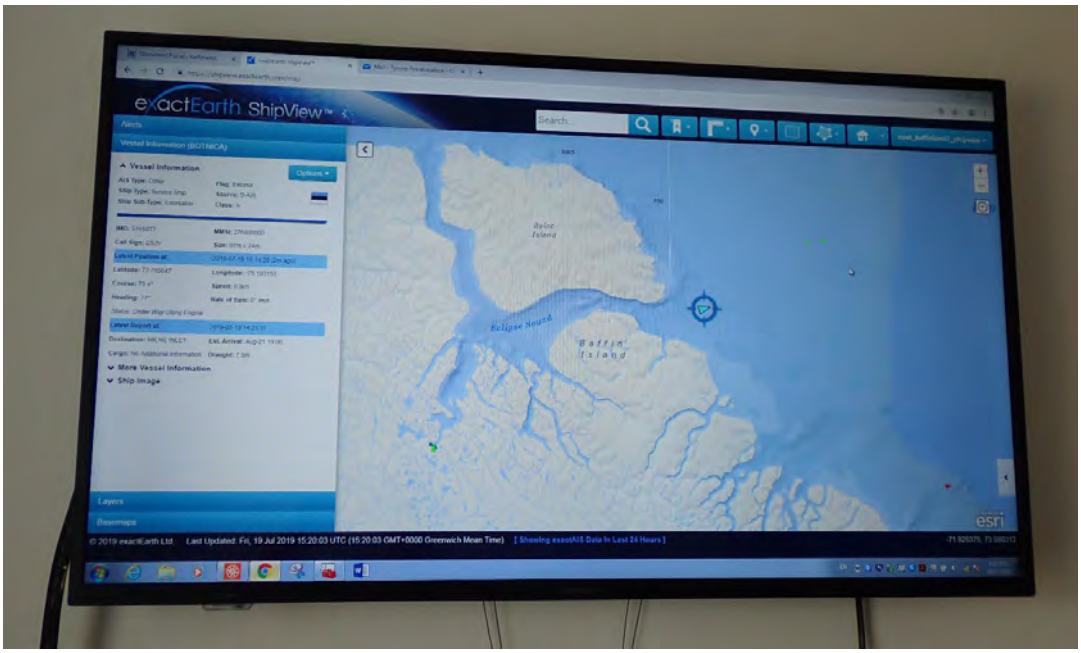

Figure 4.1: Large wall-mounted TV monitor in Baffinland's Shipping Monitor office located on the 2nd floor of the MHTO office building in Pond Inlet showing live exactEarth ShipView tracking of Baffinland vessels

4.2 SUMMARY OF 2021 IMPLEMENTATION OF BAFFINLAND'S SHIPPING COMMUNICATIONS PROTOCOL

Following the end of the 2020 shipping season, Baffinland sought alternative methods to in-person meetings in order to provide information on previous 2020 activities and to give an opportunity for the community of Pond Inlet to ask questions about the recent shipping season. This included Baffinland host a two-hour public radio show on November 5, 2020.

Baffinland also attempted to schedule an End of 2020 Shipping Season meeting in February 2021. A letter was sent to the MHTO and the Hamlet of Pond Inlet on February 25, 2021 requesting availabilities to schedule a meeting in the coming week(s). Based on availabilities of both the MHTO and the Hamlet, a two-hour conference meeting was held on May 28, 2021. Proposed key agenda items included (i) a summary of 2020 shipping season activities; (ii) 2021 pre-shipping season details; and (iii) 2021 Monitoring Programs.

Baffinland also hosted a public radio show in order to continue discussions with residents of Pond Inlet on June 2, 2021. A brief update was provided at the start of the radio show covering the following topics: i) overview of 2020 shipping season; (ii) how Baffinland tracks vessels; (iii) what happens when Baffinland receives Automatic Identification System (AIS) tracker alerts; (iv) Reasons for the icebreaker MSV Botnica transiting in the summer when no ice is present; (v) Change in shipping lane near Bruce Head; (vi) summary of 2021 programs, and (vii) 2021 monitoring programs. Subsequently, the phone line was opened for questions to Baffinland from the general public. Questions/comments voiced by callers dealt with ballast water treatment, narwhal migration patterns and existing marine mammal monitoring programs (Figure 4.2).

Subsequent to these meetings, Baffinland has been following up with the MHTO on various topics identified as follow-up items. Baffinland also announced the start of the seal aerial surveys using Facebook, provided responses to certain questions received via Facebook, and announced the commencement of the seal surveys on the radio.

Figure 4.2: Photo taken during Community Radio Show hosted by Baffinland's Head of Northern Affairs

MHTO announced on Facebook's Pond Inlet News page that the floe edge was to be closed on July 3, 2021 at 11:59am. Baffinland has since followed up with the MHTO to receive formal confirmation that the floe edge was indeed closed on July 3, 2021. As of July 9, 2021, the MHTO has yet to provide official confirmation to Baffinland. Baffinland has also reached out to the MHTO requesting a follow-up discussion on the upcoming 2021 shipping season, including proposed mitigation measures. Details of additional meetings will be included in the 2021 Annual Report to the NIRB.

4.3 ENGAGEMENT RELATED TO THE 2021 NARWHAL ADAPTIVE MANAGEMENT RESPONSE PLAN

On April 8 2021, Baffinland provided to the NIRB a Technical Memo prepared by Baffinland's marine mammal monitoring technical consultants, Golder Associates Ltd. (Golder), entitled Preliminary Summary of 2020 Narwhal Monitoring Programs (the Memo) (Doc ID: 334991). The Memo outlined key results of Baffinland's 2020 marine mammal monitoring programs, notably that through the 2020 marine mammal aerial survey, Golder had recorded a statistically significant decline in the stock estimate for the Eclipse Sound narwhal stock. The Memo also included a preliminary investigation of several factors that may have contributed to the recorded decline in the stock estimate, including icebreaking activities associated with Baffinland's 2020 shipping season.

Subsequent to Baffinland's April 8, 2021 submission, the NIRB facilitated a comment and response period for interested Parties on the Memo. On or before May 17, 2021, the NIRB received comments from:

1. Qikiqtani Inuit Association (QIA; Doc ID: 335352);

2. Hamlet of Pond Inlet (Doc ID: 335355 & 335356);
3. Ikajutit Hunters and Trappers Organization (IHTO; Doc ID: 335354);
4. Government of Canada;
    a. Department of Fisheries and Oceans Canada (DFO; Doc ID: 335350)
    b. Parks Canada (PC; Doc ID: 335353)
5. Oceans North (ON; Doc ID: 335351).

On June 4, Baffinland provided responses to comments from these Parties (Doc ID: 335788).

In addition to NIRBs facilitated exchange of written comments on the Memo, Baffinland conducted its own engagements with several Parties. A summary of these engagements is as follows:

1. Meeting with DFO on April 9 2021 to provide an overview of information contained within the Memo.
2. Sent an information request to DFO on April 22 2021 to obtain additional information on the 2020 Small Craft Harbour (SCH) construction activities for the purpose of conducting additional investigations into potential causal factors.
3. Provided the Marine Environmental Working Group (MEWG) copies of all its 2020 Draft Marine Monitoring Program Reports on May 13, 2021, with comments expected back from the MEWG on June 24, 2021.
4. Submitted to the Nunavut Impact Review Board (NIRB) its 2020 Annual Monitoring Report as of May 6, 2021, with comments expected back from interested Parties on July 6, 2021.
5. Held a meeting with the MEWG on May 13, 2021 to provide an opportunity for members to ask questions regarding the Technical Memo in advance of their written submissions. A copy of the draft minutes from the May 13 2021 MEWG Meeting and the relevant presentation materials were provided to the NIRB as part of Baffinland's June 4 2021 submission (Doc ID: 335788).
6. Met with representatives from the Mittimatalik Hunter and Trappers Organization (MHTO) and the Hamlet of Pond Inlet to discuss plans for the 2021 shipping season on May 28, 2021,
7. Hosted a radio show in Pond Inlet with a question and answer period on June 2, 2021.
8. Met with representatives from DFO on June 22, 2021 to provide an opportunity for follow-up questions on Baffinland's responses to comments submitted by DFO on the Memo and to discuss the Draft version of the 2021 Narwhal Adaptive Management Response Plan.
9. Held a meeting with the MEWG on June 29, 2021 where details regarding Baffinland's 2021 monitoring programs and an overview of shipping season were provided.
10. Met with representatives from the Hamlet of Pond Inlet on June 30, 2021 and July 12, 2021 to discuss Baffinland's Draft version of the 2021 Narwhal Adaptive Management Response Plan
11. Sent an information request to the Government of Nunavut on July 7, 2021, with follow-up on July 12, 2021 to obtain additional information on the 2020 Small Craft Harbour (SCH) construction activities for the purpose of conducting additional investigations into potential causal factors.

Baffinland also requested additional meetings with the QIA and MHTO to discuss the Memo, however, neither Party responded with an intention to meet.

4.3.1 Key Outcomes

Through these consultation efforts, to-date Baffinland has received at a high level, the following feedback.

Table 4.2: Summary Of Engagement Outcomes

Summary of Comment/ Recommendation	Baffinland Response / Outcomes
Recommendations from Hamlet of Pond Inlet, Parks Canada, DFO and QIA on enhancements to Baffinland's existing and proposed monitoring programs.	Baffinland has committed to working with these Parties further on the refinement of these programs (i.e. analysis of EWI monitoring at Bruce Head). Baffinland also reaffirmed the need for and importance of strengthened regional monitoring that will enhance Baffinland's ability to discriminate Project-related effects from other anthropogenic activities or environmental changes that could be affecting the Eclipse Sound narwhal stock.
DFO and QIA identified the need for additional details on the methodology and analysis undertaken for each of Baffinland's 2020 marine mammal monitoring program in order to provide more fulsome feedback.	Baffinland distributed copies of all of its draft 2020 marine monitoring programs to the MEWG on May 13, 2021. Comments were submitted by MEWG members on July 8, 2021. Responses to all comments received will be provided as an appendix to the final versions of these monitoring reports, which will incorporate comments from the MEWG as relevant.
Hamlet of Pond Inlet and QIA requested additional information on pile driving activities associated with the SCH construction and icebreaking activities, respectively.	Baffinland noted that requests for additional information on SCH activities were directed to the GN and DFO. Baffinland has submitted information requests to these Parties that would assist in answering in some of the Hamlet's inquiries, however no information has been provided by these Parties to-date. In response to the QIA, Baffinland provided an appendix to its June 4 2021 responses to comments that breaks down the distance travelled by vessels in various ice concentrations along the shipping route in 2017, 2018, 2019 and 2020.
QIA and DFO sought additional information regarding how Baffinland had accounted for the SCH in its cumulative effects assessment.	Baffinland provided clarity to these Parties on its responsibilities with respect to cumulative effects assessment and monitoring. Baffinland also requested DFO formally describe what its mandated responsibilities are for cumulative effects monitoring on a regional scale with respect to managing cumulative effects on marine mammals in Canadian Arctic waters and provide its proposed strategy for cumulative effects assessment in this regard, and describe what level of cumulative effects monitoring has been completed by the Government of Canada to date in support of this work.
Recommendations from MHTO and Hamlet of Pond Inlet to eliminate all icebreaking activities from Baffinland's operational activities.	Baffinland proposes to avoid icebreaking at the beginning of the 2021 shipping season. The trigger to begin shipping will be a continuous path of 3/10ths ice concentrations between Baffin Bay and Milne Port. The icebreaker will still be present throughout the season, however, it will only serve as a precaution at the beginning of the shipping season. Icebreaking may still be required at the end of the shipping season, depending on ice conditions. However, Baffinland will continue to close the shipping season to avoid breaking landfast ice.

5 MITIGATIONS FOR MARINE MAMMALS AND TRADITIONAL HARVESTING

5.1 ADAPTIVE MANAGEMENT MEASURES FOR 2021

Recognizing the value of the Eclipse Sound narwhal stock to the residents of Pond Inlet, and that there are unknown and/or unmitigated cumulative activities occurring in the Marine RSA that are likely to continue in 2021, Baffinland is committed to taking a precautionary approach and adding additional mitigations to its shipping activities in 2021 on an interim basis.

Baffinland has elected to implement an additional mitigation measure during the 2021 shipping season as a precaution. Baffinland has committed that the 2021 shipping season will not commence until a continuous path of 3/10ths or less ice concentration is available along the Northern Shipping Route. Based on historical ice conditions, this additional mitigation could delay the start of shipping between 2 and 3 weeks from when landfast ice has broken along the Northern Shipping Route, and is more conservative than all 5 options recommended by Golder in the Preliminary Summary of 2020 Narwhal Monitoring Programs (the Memo), including Option 5, which is based on a recommendation by the Hamlet of Pond Inlet.

The additional mitigation measure will serve to delay the commencement of the shipping season, eliminate icebreaking activities, and shorten the overall number of shipping days available to Baffinland in the 2021 season. The scale of the delay in the shipping season and reduction in shipping days will not be known with certainty until operations commence.

Baffinland will continue to implement all other existing mitigation measures as described in Section 6 of the Shipping and Marine Wildlife Management Plan (2021) and summarized below.

5.2 SHIPPING MITIGATIONS MEASURES TO REDUCE IMPACTS ON MARINE MAMMALS

All vessels are instructed to follow the nominal shipping route to the fullest extent possible, however at the start and end of the shipping season there may be a need for slight deviations from the nominal route to avoid interactions with ice. Any notable deviations will be communicated to hunters on the water and in the communities via the Baffinland's Shipping Monitors. In all cases vessels will continue to be instructed to avoid Koluktoo Bay, the western shoreline near Bruce Head and 10km from the shoreline of Pond Inlet to minimize effects on marine mammals and interference with hunting activities (Figure 5.1).

All Project vessels will restrict speed to 9 knots when transiting along the established shipping corridor, and will be operated in such a way as to avoid separating an individual member(s) of a group of marine mammals from other members of the group. When marine mammals appear to be trapped or disturbed by vessel movements, the vessel will implement appropriate measures to mitigate disturbance, including stoppage of movement until wildlife move away from the immediate area.

A detailed description of mitigations for minimizing Project-related activities on marine mammals are available for review in Baffinland's Shipping and Marine Wildlife Management. Table 5.1 summarizes these mitigations:

Table 5.1: 2021 Mitigation Measures For Marine Mammals

Project Activity	Mitigation Measure(s)	Species
Vessel traffic to/from Milne Port	• Maintain constant speed and course when possible. • Reduce vessel speed to 9 knots. • Reduce vessel idling	Ringed Seal, Bearded Seal, Walrus, Beluga, Narwhal,

Project Activity	Mitigation Measure(s)	Species
	• **Additional temporary measures have been introduced for 2021 that shipping will not commence until a continuous path of 3/10ths or less ice concentrations between the entrance of Eclipse Sound and Milne Port is present.** • No breaking of landfast ice will occur in the spring or fall shoulder season. • If marine mammals appear to be trapped or disturbed by Project vessel movements, the vessel will implement appropriate measures to mitigate disturbance, including stoppage of movement until wildlife move away from the immediate area (as safe navigation allows). • All Project vessels will be provided with standard instructions to operate their vessel in a manner that avoids separating an individual member(s) of a group of marine mammals from other members of the group; • All Project vessels will be provided with standard instructions to not approach within 300 m of a walrus or polar bear observed on sea ice; • Vessels awaiting instructions from the Port Captain to enter the RSA will be instructed to wait in Baffin Bay at least 40 km east of the Nunavut Settlement Area.	Bowhead Whale, Polar Bear

It is important to note that none of the aforementioned mitigations related to vessel movement, should be read in any way as over-riding the Master's authority and responsibility for safe navigation and management of the vessel.

Baffinland has also developed several mitigation and management measures to directly minimize the effects of the Project on Inuit hunting and harvesting activities and to ensure land user safety in the presence of Project activities.

Mitigation measures include:

- Waiting for confirmation from the MHTO that the floe edge has been closed for hunting prior to the start of the shipping season
- Development of an extensive Shipping Communications Standard Operating Procedure for the Project, that includes the hiring of a minimum of two-full time shipping monitors within Pond Inlet who provide community updates on vessel traffic both over community radio and VHF throughout the shipping season.
- Limiting the number of vessels anchored or drifting at Ragged Island to a maximum of three vessels at any time throughout the shipping season.
- Establishment of voluntary speed restrictions (9 knots) for all Project vessels travelling along the Northern Shipping Route to minimize ship wake and disturbance to marine mammal harvesting activities.
- Establishment of a nominal shipping route for all Project-vessels to follow to increase predictability and safe passage for hunters while Project-vessels are present in the Northern shipping corridor (see Figure 2.2).
- Establishment of 'no-go zones', specifically near Saviit (along shoreline of Bruce Head), which has been identified as an important hunting area. (see Figure 5.1).

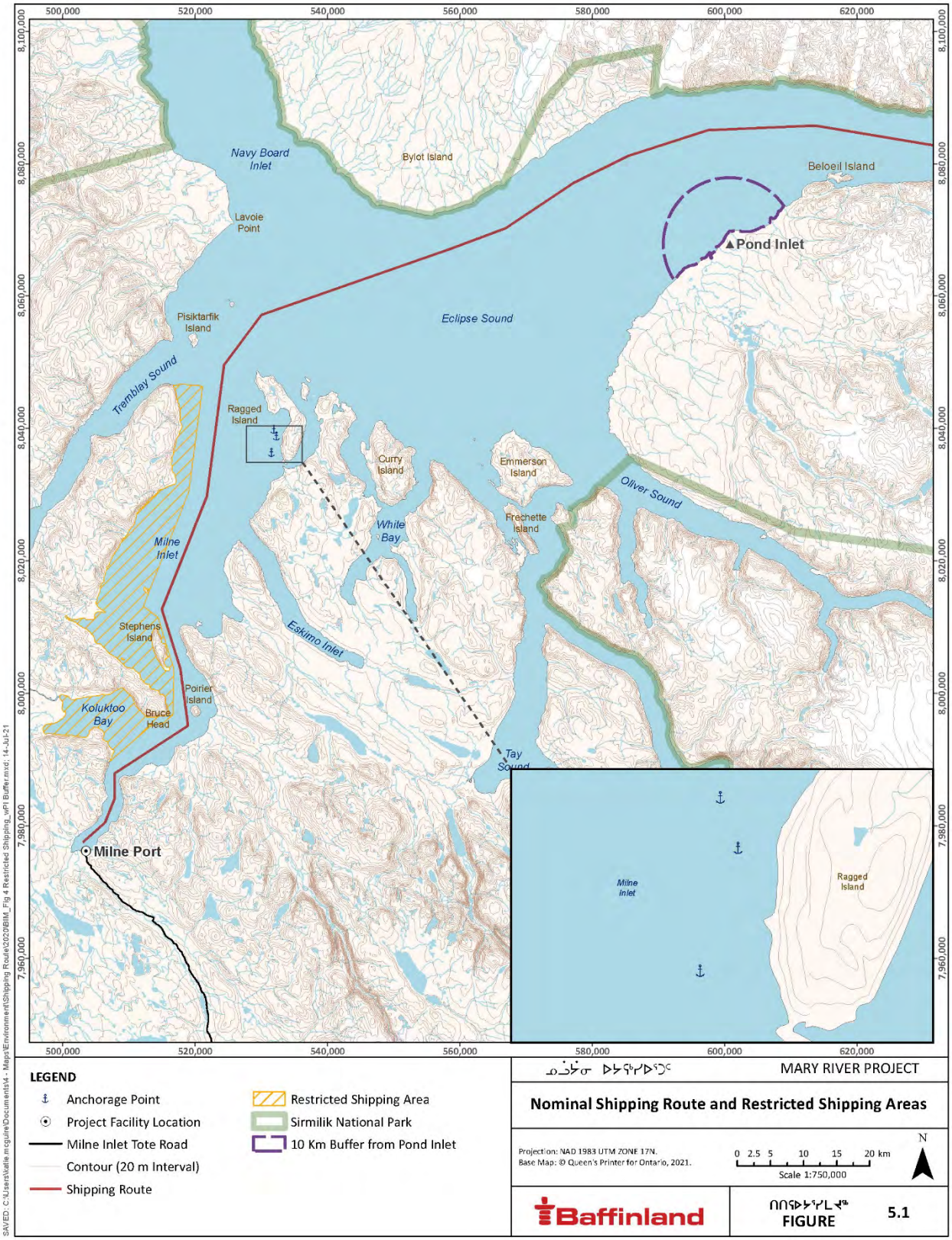

Figure 5.1: Nominal Shipping Route and Restricted Shipping Areas

- Providing fuel to hunters who visit the Project site.
- Providing food, water and shelter at the Project site.
- Support Inuit in identifying, communicating and using safe routes in or around the Project infrastructure.

5.3 IMPACT BENEFIT PROGRAMS FOR INUIT

Consistent with Article 12.5.5 (e) of the Nunavut Agreement, Baffinland has also made the following commitments to compensate for Project-effects on Inuit land use that were predicted within the Early Revenue Phase Final Environmental Impact Statement (ERP FEIS) and Production Increase Proposal Extension Amendment Package and have since been reported by community members since the start of the Project.

When Project activities began in 2013, Inuit and the Company acknowledged that impacts to harvesting may occur from the Project. Specifically, Article 13.1 of the Inuit Impact and Benefit Agreement (IIBA) notes the following:

> *"The objective of Article 13 hereof is to ensure that any potential incompatibility of the rights of Inuit to free and unrestricted travel and access for harvesting to all lands, water and marine areas within the Nunavut Settlement Area with the Company's land use activities and rights of navigation in marine areas may be reduced….The QIA recognizes that the Company's right to operate and manage their activity within the Project area including the rail and shipping corridor, subject to the provisions of this Agreement and QIA recognizes the restriction on Inuit right of access under Sections 5.7.18 and 5.7.25 of the NLCA…"*

More specifically, concerns raised relating the discharge of firearms within the Project area are accounted for under Article 13.5.1 of the IIBA, which states the following:

> *"Inuit travelling in or accessing the Project lands shall not discharge firearms or otherwise pursue access for harvesting, within one (1) mile of a Project building, structure or facility, in conformity with Clause 5.7.17 (b) of the Nunavut Land Claim Agreement (NLCA), subject to wider safety or where the access for harvesting, including the discharge of firearms is incompatible with ongoing land use activity of the Company."*

In consideration of these effects, Article 5 (Financial Participation) ensures that Inuit receive a minimum of $1,250,000 quarterly, or $5,000,000 annually, in the form of resource royalties (IIBA 5.6.3, 2018).

Baffinland also provides funding for the Wildlife Compensation Fund (Article 17.6 of the IIBA); with distribution of this fund managed directly by the QIA. One of the stated purposes of IIBA Article 17 is to establish a wildlife compensation fund that QIA, an HTO, or an Inuk may apply to, as an additional remedy to an NLCA claim for wildlife compensation.

The amended IIBA, which was signed after the QIA provided support for the PIP, also included the establishment of

- Hunters Enabling Fund which provides 300 Liters of fuel to Inuit over the age of 12 residing in Pond Inlet, with an annual maximum value of $400,000. (IIBA 17.7, 2018),
- Marine Research Equipment which will provide each North Baffin Community with a marine vessel beginning in 2021 (IIBA 17.9, 2018), and the
- Wildlife Monitoring Program which provides $200,000 annually to the MHTO to conduct community based research (IIBA 17.8, 2018).

The Marine Research Equipment (IIBA 17.9) and Wildlife Monitoring Program (IIBA 17.8) were developed in part due to the concerns expressed by harvesters and the desire for more community based monitoring that is planned, led,

and carried out by Inuit in the North Baffin Communities. This allows for topics of greatest concern to be actively monitored by Inuit.

Moreover, in response to concerns raised during the PIP, Baffinland, the Mittimatalik Hunter and Trappers Organization, and the Hamlet of Pond Inlet signed the, "Agreement to Establish the Pond Inlet Committee"[1]. This agreement recognized the desire for improvements to the way in which Project benefits were being distributed to communities. The agreement commits Baffinland to providing $10,000.00 to the Tasiuqtiit Working Group for every ore carrier required to ship in excess of 4.2 MTPA. Since its signing, this Agreement had led to the direct disbursement of $540,000 to the community of Pond Inlet ($130,000.00 in 2018, $240,000.00 in 2019 and $170,000.00 in 2020). Baffinland has also committed to funding for a coordinator position for this group to support the functioning and disbursement of funds. This agreement will remain in place should the Project continue to be approved to ship above 4.2 Mtpa.

[1] This agreement led to the creation of Tasiuqtiit Working Group.

6 MONITORING PROGRAM REVIEW

6.1 MARINE MONITORING PROGRAM ENGAGEMENT ACTIVITIES

Baffinland's 2021 engagement activities with the community of Pond Inlet and other Parties, including the MEWG are summarized in Section 4. There were three notable outcomes as a result of these engagement activities:

1. MHTO identified that operations of drones from the Bruce Head camp in 2020 interfered with, or impacted hunting along the shorelines of Bruce Head. In response, on June 7 2021, Baffinland supplied the MHTO with a figure identifying a "no-fly" zone for the Bruce Head drone program (Figure 6.1). The "no-fly" zone will serve to eliminate use of the drone directly above where Inuit are hunting or camping along the shores of Bruce Head. To-date Baffinland has not received confirmation from the MHTO on the figure provided, but intends to implement a protocol avoiding this area throughout 2021 nonetheless.
2. MHTO sought confirmation that none of the photographs or videos taken via drone or aerial surveys would include images of hunters or hunting activities. Baffinland confirmed during the pre-season shipping meeting that no images of hunters or hunting activities would be publicized through Baffinland's reporting of these program.
3. During the May 13 2021 MEWG Meeting, the MHTO Chair identified that most eastern transect lines planned for the aerial survey should not be flown as this could have the potential to disrupt hunting activities on the floe edge. As a result, these transects were not flown by Ringed Seal Aerial Survey team in accordance with the MHTOs request (shown in yellow box on Figure 6.2).

More generally, historical engagement with the MHTO and the MEWG throughout 2020 and 2021 also resulted in the following key changes to the 2021 marine monitoring programs:

1. Completion of a Ringed Seal Aerial Survey in spring of 2021.
2. Addition of morphometric analysis of body condition via the drone program at Bruce Head in summer 2021.
3. Deployment of passive acoustic recorders in 2021 near the floe edge to capture vessel and marine mammal noise prior to and at the start of the shipping season[2].
4. Adding a measure of variability to the analysis of proportion of immatures (early-warning indicator) from Bruce Head based on guidance from DFO.

[2] Data collection will occur in spring 2022. A memo requesting feedback on the final selection of locations was provided to the MHTO on July 12 2021.

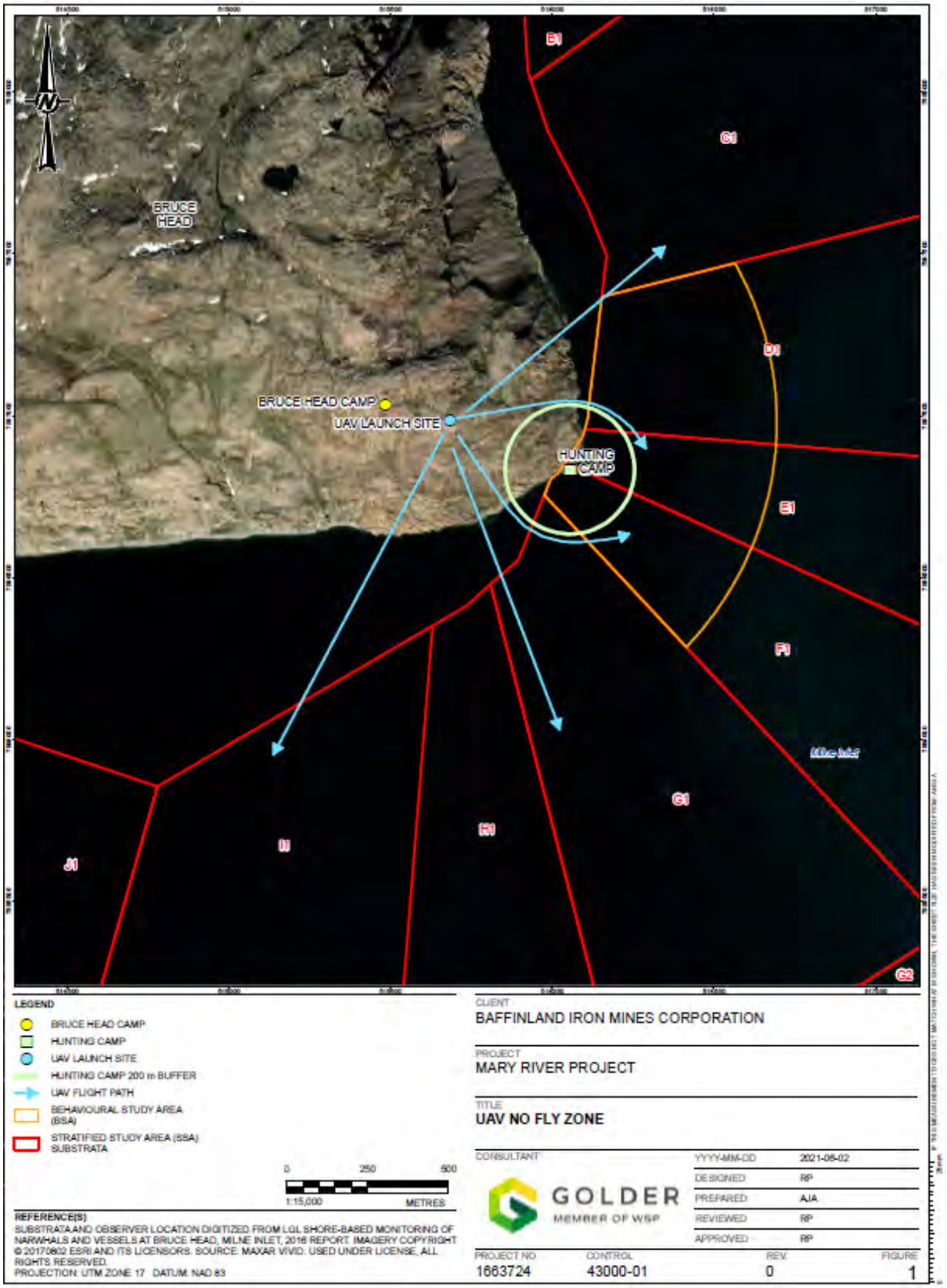

Figure 6.1: UAV No Fly Zone for Bruce Head Monitoring Program

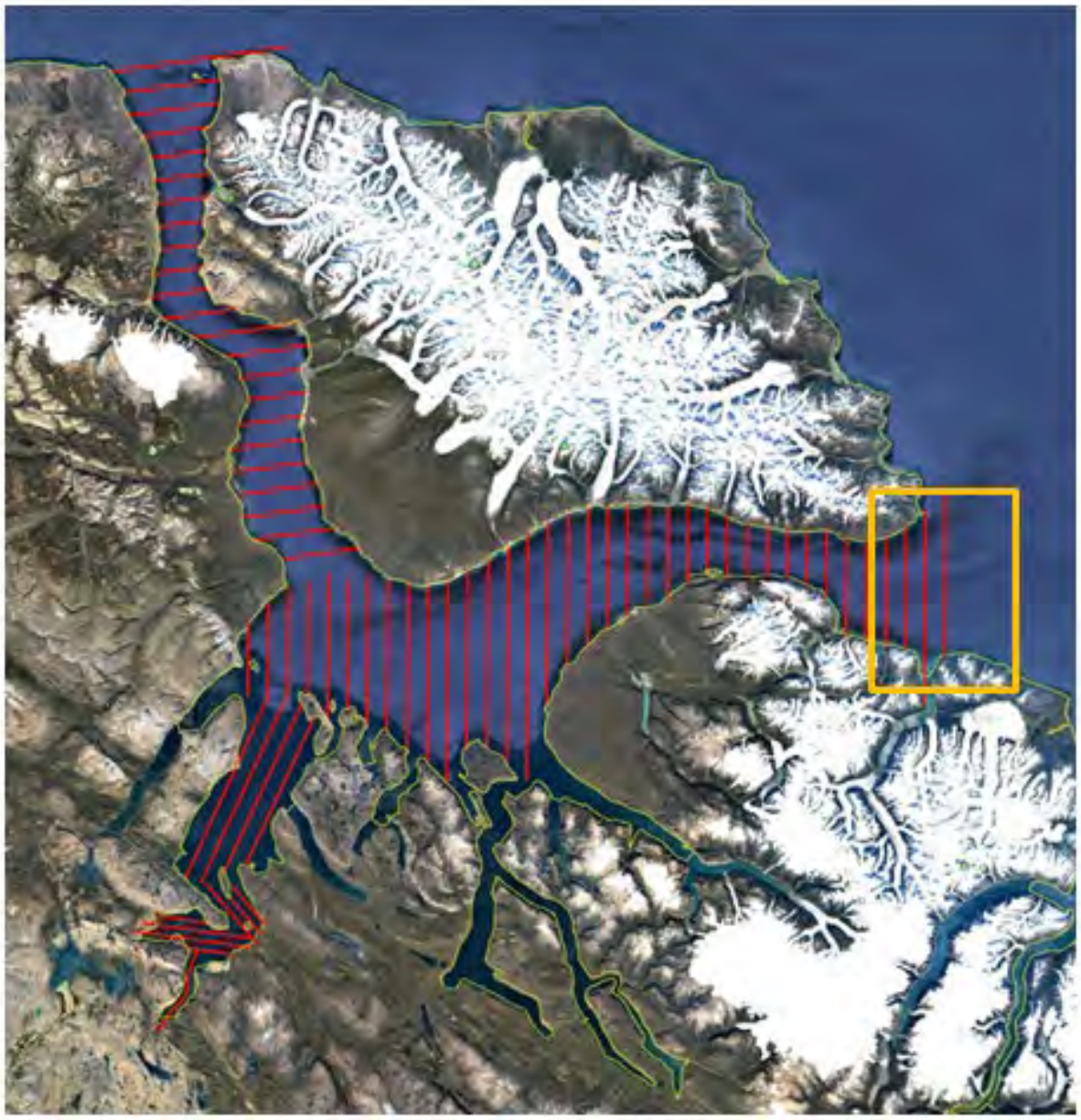

Figure 6.2: Revisions to Ringed Seal Aerial Survey Based on MHTO Feedback

6.2 2021 MONITORING ACTIVITIES

Baffinland has several marine mammal monitoring programs designed to assess the effects of Project shipping activities on marine mammals. The marine mammal monitoring programs outlined in Table 6.1 will be implemented during the 2021 shipping season. These program will serve to further Baffinland's understanding of project related and cumulative effects to narwhal in the Regional Study Area:

Table 6.1: Summary Of 2021 Marine Mammal Monitoring Progams

Program	Basic Description	2021 Follow-up Monitoring Priorities/ Considerations
Bruce Head Shore-Based Monitoring Program (Visual)	Visual Observations: • Relative Abundance and Distribution (RAD) • Group Composition and Behaviour • Human Activity o Vessel Traffic o Hunting • Weather and Anecdotal Observations *Project-related vessels tracked via both satellite and shore-based AIS Estimated Start Date: July 30th Estimated Duration: 4 weeks	• Monitor for local change in relative abundance and animal distribution including interannual variation • Monitor behavioural responses to shipping and other stressors (hunting, predation) • Monitor Early Warning Indicator (EWI): change in the proportion of immature narwhal between years – was calving or calf survival potentially affected in 2020
Bruce Head Shore-Based Monitoring Program (UAV)	UAV Observations: • Focal Follows – Northern Shipping Route, Koluktoo Bay • Systematic Survey – Stratified Study Area (SSA) • Morphometrics – Body Condition *Proposed system by InDro Robotics: DJI M300 Estimated Start Date: July 30th Estimated Duration: 4 weeks	• Monitor narwhal behaviour in the presence and absence of vessels – do individual narwhal or narwhal pods modify their behaviour in the presence/absence of vessels in the open-water shipping season (multiple response variables examined) • Does the distance at which individual narwhal or narwhal groups react to vessels differ from past years, irrespective of the overall abundance of narwhal in the RSA? do narwhal react to vessels in similar manner to previous years? • Monitor narwhal body condition (beginning in 2021). The photogrammetric data collection of narwhal (morphometric baseline data) using UAV will be sued to monitor for potential interannual and seasonal changes in narwhal body condition (variable length/width measurements along body) that would indicate food/foraging success and/or stress response.
Marine Mammal Aerial Survey Program (Leg 1)	• Open-water and floe edge area east of Pond Inlet; Pond Inlet and Baffin Bay strata	• Monitor narwhal relative abundance and distribution in the Regional Study Area (RSA) prior to and during the early part

Program	Basic Description	2021 Follow-up Monitoring Priorities/ Considerations
	• Line-transect surveys – data recorded by onboard MMOs • Transition to photographic surveys when large animal aggregations encountered (same as 2019-2020 survey design) Estimated Start Date: July 18th; Estimated Duration: 19 days	of the season. Allows comparison to previous year(s) (interannual variation). Collect simultaneous data on sea ice conditions and killer whale data which allows for these factors to be considered in the analysis. • The 2021 Leg 1 aerial surveys have been extended by 1 week (now 3 weeks total) and will merge directly into the Leg 2 aerial surveys (separate 3-week survey). Will allow for abundance estimates in the RSA throughout the season from the start of shipping operations. • Narwhal sightings data will be used to inform shipping schedule and shipping routing such to avoid concentrations of narwhal in ice leads (if present)
Marine Mammal Aerial Survey Program (Leg 2)	• Same strata as 2016 DFO photographic aerial survey and 2019-2020 BIM aerial survey • Line-transect surveys – data recorded by onboard MMOs • Transition to photographic surveys when large animal aggregations encountered (same as 2019-2020 survey design) Estimated Start Date: August 6th Estimated Duration: 19 days	• Updated abundance estimate for the Eclipse Sound and Admiralty Inlet narwhal summer stocks – compare abundance estimates to previous years. • Extend Leg 2 to by 1 week to 3 weeks total in 2021 to cover a great spatial extent and track potential changes in narwhal distribution and abundance during shipping operations (now merges directly with Leg 1 aerial survey).
Marine Mammal Aerial Survey Program (Leg 3)	• 2-3 days of narwhal clearance flights in Regional Study Area (RSA) at end of shipping season • Line-transect surveys – data recorded by onboard MMOs • Transition to photographic surveys when large animal aggregations encountered (same as 2019-2020 survey design) Estimated Start Date: End of Shipping Season Estimated Duration: 2 days	• Visual clearance survey to confirm that no narwhal entrapment events have occurred in the RSA following completion of Baffinland's 2021 shipping operations along the Northern Shipping Route.

Program	Basic Description	2021 Follow-up Monitoring Priorities/ Considerations
Passive Acoustic Monitoring Program	Early August: deployment of 3 recorders • Bruce Head • Ragged Island anchorage • Pond Inlet (Small Craft Harbour Construction) September • Retrieval of 3 recorders deployed in August • Re-deployment of 2 recorders at the floe edge o Record late shoulder season transits in 2021 o Sleep overwinter o Start recording in early July 2022: Record narwhal at floe edge and early should season transits Estimated Start Date: Early August Estimated Duration: 2020 open water and Fall shoulder season; 2022 Spring shoulder season	• Measure and characterize ambient noise levels along the Northern Shipping Route – compare the data to previous years. • Acoustically monitor for narwhal and killer whale presence along the shipping corridor – document spatial and temporal variability in the RSA. • Evaluate underwater noise levels from Project shipping and icebreaking noise levels in relation to established marine mammal underwater acoustic thresholds for injury and onset of disturbance. • Estimate the extent of listening range reduction (LRR) associated with vessel transits along the Northern Shipping Route relative to ambient noise conditions. • Compare measured sound levels of shipping/icebreaking to estimated (modelled) sound levels. • Evaluate vessel noise signatures and potential changes in narwhal vocal behaviour in relation to shipping. • Measure pile driving and other construction sound levels near the Small Craft Harbour Construction site in August 2021.
2022 Narwhal Tagging Program (Planning in 2021)	• Deployment of high-resolution location (satellite) tags and dive loggers on narwhal in ice leads in Eclipse Sound during early July 2022. • No tagging of narwhal will occur near floe edge (no interference with Inuit hunting activities) • No live capture involved. Remote deployment of tags. Tags will fall off animal after several weeks. Estimated Start Date: July 05 2022 Estimated Duration: 14 days	• Will provide detailed 3-dimensonal movements of narwhal in relation to ice conditions and vessel movements in RSA. Studying narwhal behavioural responses to shipping/icebreaking – includes 12 response variables (e.g. surface time, bottom time, dive velocity, travel speed, travel orientation, etc).

Figure 6.3: 2020 Bruce Head Shore-Based Program Field Research Team

Figure 6.4: Narwhal Observed in Milne Inlet in August 2020 using drone deployed from Bruce Head

6.3 INUIT PARTICIPATION AND COMMUNITY BASED MONITORING

6.3.1 Inuit Participation in Marine Monitoring Programs

Due to the COVID-19 pandemic and associated safety considerations and latest restrictions as determined by the Government of Nunavut and Nunavut Public Health, Baffinland is unable to plan for the participation of community members in any of our 2021 marine monitoring programs. This is necessary to help protect Nunavummiut communities from the risk of COVID-19 and to ensure compliance with the Government of Nunavut and Nunavut Public Health Orders. Should circumstances change, Baffinland will work with its contractors to maximize Inuit participation where possible.

6.3.2 Support for Community-Based Monitoring Programs

In 2018, as part of updates to the Inuit Impact Benefit Agreement (IIBA) for the Mary River Project (the Project), Baffinland established the Wildlife Monitoring Program (Article 17.8 of the IIBA), which is a community-based monitoring program, specific to the research interests of the community of Pond Inlet. Baffinland looks forward to considering the results of these community-driven monitoring efforts into the design of future monitoring programs led by Baffinland and as part of contributions to overall adaptive management practices adapted by Baffinland. As results from the community-based monitoring programs become available, Baffinland will seek to work with the MHTO to conduct a comparison of results, where appropriate. Baffinland has not received a proposal under the Wildlife Monitoring Program since 2019.

7 AQUATIC INVASIVE SPECIES / NON-INDIGENOUS SPECIES MONITORING

7.1 2020 AQUATIC INVASIVE SPECIES / NON-INDIGENOUS SPECIES MONITORING PROGRAM RESULTS

During 2019 AIS sampling, a polychaete worm species was collected that was identified as M. Viridis. Although no available literature supports the designation of M. Viridis as being invasive in the Canadian Arctic, Baffinland acknowledged that the species may be considered non-indigenous in the Arctic. This was reported on in Baffinland's 2019 Marine Environmental Effects and AIS/NIS Monitoring Program Report, which is currently available on the NIRB Registry. Baffinland also presented on this finding during the August 25, 2020 NIRB Marine Monitoring Workshop.

During the 2020 field season, additional targeted sampling was completed to assess if the range or presence of the worm species had changed at Milne Port since the 2019 finding. As summarized in Baffinland's Draft 2020 Marine Environmental Effects Monitoring Program (MEEMP) and AIS Monitoring Program Report, no occurrences of this species were observed in 2020 at any of the sampling stations where M. viridis was recorded the year previous (2019), and were found at other sites that had not been previously sampled, further suggesting they may have a natural range that was only first identified in 2020.

Update on Misidentification of M. Viridis

Since the Draft 2020 Marine Environmental Effects and AIS/NIS Monitoring Program Report was released to the MEWG, **Baffinland has confirmed through additional taxonomic analysis and consultation with experts on this group of polychaete worms that the sample of M. viridis was misidentified**. **The species collected at Milne Port is now confirmed to be M. arctia, a species closely related to M. viridis. M. arctia is well documented as a species with a natural range in the Canadian Arctic.** Baffinland intends to append a Technical Memo to the Final 2020 Marine Environmental Effects and AIS/NIS Monitoring Program Report detailing these verified results, and will provide a copy of this memo to the MHTO and Hamlet of Pond Inlet concurrently.

7.2 2021 AQUATIC INVASIVE SPECIES / NON-INDIGENOUS SPECIES MITIGATION AND MONITORING

In 2021, Baffinland will continue to require all ore carrier vessels with treatment systems to perform both a ballast water exchange and treatment as part of ongoing management and mitigation measures aimed at reducing/eliminating the potential risk of introduction of aquatic invasive species at Milne Port. Baffinland intends to continue implementation of its Ballast Water Management Plan in 2020, which includes monitoring for compliance with D-1 Regulations on all project vessels prior to discharge of ballast water at Milne Port. Baffinland will also continue to implement monitoring of aquatic invasive species/non-Indigenous species (AIS/NIS) sampling at Milne Port in 2021.

Appendix 1

2021 Shipping and Marine Wildlife Management Plan

Baffinland Iron Mines Corporation

SHIPPING AND MARINE WILDLIFE MANAGEMENT PLAN

BAF-PH1-830-P16-0024

Rev 8

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DOCUMENT REVISION RECORD

Issue Date MM/DD/YY	Revision	Prepared By	Approved By	Issue Purpose
02/2012	1	BL	OC	Version submitted in February 2012 FEIS
05/2013	2	BL	OC	Revisions related to the Terms and Conditions in NIRB Project Certificate No. 005
06/2013	3	BL	OC	Updates to Baffinland responsibilities table, updates for submission as supporting material for the FEIS addendum.
10/2014	4	BL	OC	Updated to reflect Early Revenue Phase and the amended NIRB Project Certificate No. 005
03/2015	5	OC	EM	Update to reflect operations
03/2016	6	JS	OC	Update table of contents and concordance
07/2020	7	EM	LK	Updated to reflect 6 MTPA operations and associated mitigations
06/2021	8	EM	LK	Updated to reflect temporary additional mitigations for 2021 shipping season

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1 INTRODUCTION

1.1 Purpose

The Shipping and Marine Wildlife Management Plan (SMWMP) has been developed to:

- Address the issues of concern to Inuit with respect to shipping associated with the Mary River Project (the Project).
- Establish rules and procedures applicable to shipping during the construction, operational and decommissioning phases of the Project.
- Outline the existing mitigation and management measures related to Project shipping designed to minimize potential effects of Project activities on the marine environment, marine mammals, and traditional hunting and harvesting activities.

The SMWMP is a part of the Baffinland Iron Mines Corporation (Baffinland) Environmental Management System (EMS) and reflects Baffinland commitments with respect to shipping activities associated with the Project. Specifically, the SMWMP:

- Describes the means whereby Baffinland ships, fuel and equipment to the site, and exports iron ore from the Milne Port Site.
- Describes the management of the shipping operation, including the commissioning and operation of iron ore carriers. The SMWMP also describes the specifications and procedures in place for charter and operation of suitable vessels to export iron ore on a seasonal basis.
- Addresses the management, routing and operation of ships and describes how the vessels will navigate through and in the vicinity of ice.
- Describes the monitoring and mitigation measures, and adaptive management procedures to be employed in addressing concerns related to marine wildlife, including mammals and birds.

It is noted that in all matters of marine transportation, the Master of the vessel has an overriding obligation to protect the safety of his vessel, crew and the environment for which he is ultimately responsible and, notwithstanding anything contained in this SMWMP, the Master will always be guided by this principle.

1.2 Relationship to Other Management Plans

This plan should be viewed in concert with the following additional plans that have been prepared for the Project:

- Environmental Protection Plan (EPP)
- Emergency and Spill Response Plans (Spill at Sea Response Plan)

- Spill Contingency Plan
- Oil Pollution Emergency Plan – Milne Inlet (OPEP)
- Marine Monitoring Plan (MMP)
- Shipping Communications Protocol
- Interim Closure and Reclamation Plan
- Ballast Water Management Plan
- Standing Instructions and General Information for Masters of Vessels loading at Milne Inlet Port. (SITM – Managed by Fednav)

1.3 Management Plan Revision

The Shipping and Marine Wildlife Management Plan will be updated as required on the basis of management reviews, incident investigations, regulatory changes or other Project related changes, including the introduction of new adaptive management measures related to shipping.

Baffinland will update and modify its Standing Instructions to Masters and Shipping and Marine Wildlife Plan as necessary to reflect the outcomes of simulation modelling, regulatory approvals, and annual engagements with the community of Pond Inlet and the Mittimatalik Hunter and Trappers Organization (MHTO), and in and input on adaptive management and mitigations measures provided by the Qikiqtani Inuit Association (QIA), Fisheries and Oceans Canada (DFO) and the Marine Environment Working Group (MEWG).

1.4 Project Description

In 2012, the Nunavut Impact Review Board (NIRB) issued Project Certificate No 005 which provided approval for Baffinland to mine 18 million tonnes per annum (Mtpa) of iron ore, construct a railway to transport the ore south to a port at Steensby Inlet which operates year-round, and to ship the ore to market. The Project Certificate was subsequently amended to include the mining of an additional 4.2 Mtpa of ore, trucking this amount of ore by an existing road (the Tote Road) north to an existing port at Milne Inlet (see Figure 1.1). In 2018, Baffinland submitted a request for a third amendment to Project Certificate No.005 to allow for a short-term (2 year) increase in production and transport of ore via road through Milne Port from the current 4.2 Mtpa to 6.0 Mtpa. A Production Increase to ship 6.0 Mtpa from Milne Port was subsequently approved by NIRB for 2018 and 2019. In January of 2020, Baffinland applied for an Extension Request to the Production Increase Proposal to ship up to 6.0 Mtpa. The Extension Request was

FIGURE 1.1: PROJECT LOCATION

approved by the Responsible Ministers through to December 31 2021, resulting in the fourth amendment to Project Certificate No. 005.

Although Baffinland is approved for shipping through the Steensby route, this component of the Project is not currently active. As Project development continues and in advance of when shipping from the South begins, Baffinland will update and revise this management plan to include relevant mitigations and operational guidance for the southern shipping route.

1.5 Regulatory Framework

Canada is an active member of the International Maritime Organization (IMO) and is a signatory to IMO agreements such as the International Convention for the Safety of Life at Sea (SOLAS), the International Convention for the Prevention of Pollution from Ships (MARPOL), the International Convention on Load Lines, the International Safety Management Code (ISM), and the IMO International Convention for the Control and Management of Ships' Ballast Water and Sediment. The majority of operations described in this SMWMP are marine or port-related and are federally regulated by Transport Canada through the Canada Shipping Act and various International Regulations augmented by various Shipping Notices and Publications.

Up-to-date versions of these Acts and Regulations are available on Transport Canada's website available at: http://www.tc.gc.ca The transportation of all cargoes between Canadian and international ports is regulated by the Government of Canada and the International Maritime Organization (IMO) through a variety of legislation. A list of relevant Acts and regulations is included as Appendix A.

1.5.1 Project Certificate No. 005 Terms and Conditions

The plan addresses Project Certificate No. 005 Terms and Conditions as outlined in Table 1:

TABLE 1: PROJECT CERTIFICATE NO. 005 CONDITIONS RELEVANT TO THE SMWMP

PC Condition #	Term or Condition Description	Applicable to Active Phase of the Project
90	The Proponent shall incorporate into its Shipping and Marine Mammals Management Plan provisions to achieve compliance with the requirements under the International Convention for the Control and Management of Ship's Ballast Water and Sediment (2004) or its replacement and as implemented by the *Canadian Ballast Water and Control Regulations* as may be amended from time to time.	Yes
100	The Proponent shall update its Shipping and Marine Wildlife Management Plan to include avoidance of polynyas and mitigation measures designed for potential fuel spills along the shipping lane during winter months, with consideration for the impact of spilled fuel on marine mammals when the might be less mobile or able to avoid contact with spilt fuel or fumes.	No

PC Condition #	Term or Condition Description	Applicable to Active Phase of the Project
104	Subject to safety considerations and potential for conditions as determined by the crew of transiting vessels, to result in route deviations: • The Proponent shall require, for shipping to/from Steensby Port, project vessels to maintain a route to the south of Mill Island to prevent disturbance to walrus and walrus habitat on the northern shore of Mill Island. Where project vessels are required to transit to the north of Mill Island owing to environmental or other conditions, an incident report is to be provided to the Marine Environment Working Group and the NIRB within 30 days, noting all wildlife sightings and interactions as recorded by Shipboard Marine Wildlife Observers. • The Proponent shall summarize all incidences of significant deviations from the nominal shipping routes for traffic to/from Milne Port and Steensby Port as presented in FEIS and FEIS Addendum to the NIRB annually, with corresponding discussion regarding justification for deviations and any observed environmental impacts.	Part A: No Part B: Yes
105	The Proponent shall ensure that measures to reduce the potential for interaction with marine mammals, particularly in Hudson Strait and Milne Inlet, are identified and implemented prior to commencement of shipping operations. These measures could include, but are not limited to: • Changes in the frequency and timing (including periodic suspensions) of shipping during winter months in Hudson Strait and during the open water season in Milne Inlet, i.e., when interactions with marine mammals are likely to be the most problematic; • Reduced shipping speeds where ship-marine mammal interactions are most likely; and • Identification of alternate shipping routes through Hudson Strait for use when conflicts between the proposed routes and marine mammals could arise. Repeated winter aerial survey results showing marine mammal distribution and densities in Hudson Strait would greatly assist in this task.	Part A: Yes Part B: Yes Part C: No
120	The Proponent shall ensure that, subject to vessel and human safety considerations, all project shipping adhere to the following mitigation procedures while in the vicinity of marine mammals: • Wildlife will be given right of way; • Ships will when possible, maintain a straight course and constant speed, avoiding erratic behavior; and • When marine mammals appear to be trapped or disturbed by vessel movements, the vessel will implement appropriate measures to mitigate disturbance, including stoppage of movement until wildlife have moved away from the immediate area.	Yes
121	The Proponent shall immediately report any accidental contact by project vessels with marine mammals or seabird colonies to Fisheries and Oceans Canada and Environment Canada, respectively, by notifying the appropriate regional office of the: • Date, time and location of the incident;	Yes

PC Condition #	Term or Condition Description	Applicable to Active Phase of the Project
	• Species of marine mammal or seabird involved; • Circumstances of the incident; • Weather and sea conditions at the time; • Observed state of the marine mammal or sea bird colony after the incident; and • Direction of travel of the marine mammal after the incident, to the extent that it can be determined.	
125 (a)	The Proponent shall consult with potentially-affected communities and groups, particularly Hunters' and Trappers' Organizations regarding the identification of project vessel anchor sites and potential areas of temporary refuge for project vessels along the shipping routes within the Nunavut Settlement Area. Feedback received from community consultations shall be incorporated into the most appropriate mitigation or management plans.	Yes
175	The Proponent shall, in coordination and consultation with the Qikiqtani Inuit Association and the Hunters and Trappers Organizations of the North Baffin communities and Coral Harbour, provide updates to its Shipping and Marine Mammals Management Plan to include adaptive management measures it proposes to take should the placement of reflective markers along the ship track in winter months not prove to be a feasible method of marking the track to ensure the safety of ice-based travelers.	No
177	The Proponent shall enroll any foreign flagged vessels commissioned for Project-related shipping within Canadian waters into the relevant foreign program equivalent to Transport Canada's Marine Safety Delegated Statutory Inspection Program.	Yes
183	The Proponent shall collaborate with the Marine Environment Working Group to develop impact avoidance or mitigation strategies for the protection of the marine environment. The Proponent shall implement any direction from the Department of Fisheries and Oceans for any avoidance or mitigation measures, including cessation of any activity, for the protection of the marine environment.	Yes

1.5.2 Marine Environment Working Group

Baffinland has cooperated with government regulatory and resource management agencies to establish a MEWG for the Project. The group comprises membership from Environment Canada, Fisheries and Oceans Canada, Parks Canada, the Government of Nunavut, the Qikiqtani Inuit Association, and Makivik Corporation.

The MEWG provides advice to Baffinland in connection with mitigation measures for the protection of the marine environment, monitoring of effects on the marine environment and the consideration of adaptive management plans.

2 ROLES AND RESPONSIBILITIES

Baffinland's Shipping Team and Contractors are responsible for achieving compliance with applicable regulations and permit requirements. To meet these requirements, Baffinland is committed to working with only the best in class ship operators. Compliance is achieved through continuous monitoring, development and implementation of operational standards and procedures in addition to vessel owner/operator communication and awareness raising strategies.

General responsibilities include:

- To manage and schedule shipments of cargoes in and out of Project ports;
- To ensure, prior to chartering a vessel, that a pre-charter audit and/or document inspection is carried out on the vessel to confirm the condition of the vessel and that it is managed and operated in accordance with the International Safety Management (IMS) system with all certificates up to date, including any relevant foreign program equivalent to Transport Canada's Marine Safety Delegated Statutory Inspection Program.
- To provide vessel owner/operators and masters with a copy of the SITM and to maintain these documents to ensure they contain up-to-date commitments regarding operation of vessels while travelling along Project Shipping Routes;
- To review environmental monitoring and management practices and identify, as required, adaptive management measures to achieve environmental compliance.

Specific responsibilities related to shipping operations are as follows:

<u>Vessel Owners and Operators (External)</u>

- Ensure Project-vessels chartered to perform Baffinland trade meet all federal and international regulations.
- Subject to safety considerations, follow all instructions from Baffinland and or/it's contractors for operating the vessel along the Northern Shipping Route.

<u>Head of Shipping</u>

- Communicate requirements of and distribute copies of relevant management plans, including Baffinland's SMWMP to all vessel owners and operators and any contractors hired by Baffinland to support shipping operations.
- Conduct audit and inspections of vessel documents to ensure they meet Baffinland's internal requirements and federal and international regulations, as needed.

Port Captain (Contractor)

- The Port Captain oversees and organizes efficient operation of the assigned fleet at Milne Port.
- The Port Captain will contact the Head of Shipping if vessels are not following protocols and instructions as outlined in the Standing Instructions to Master.

Shipping Monitors (Baffinland Employee– Resident of Pond Inlet)

- Track Project-related vessels travelling along the Northern shipping route via AIS monitoring and live monitoring stationed out of Pond Inlet.
- Record events where ships have made significant deviations from shipping routes.
- Record environmental conditions, siting of marine mammals and vessel interactions with hunters, when information is available.
- Act as a community liaison between Baffinland and residents and hunters from Pond Inlet to address community concerns related to Project-shipping, if any when these arise.

2.1 Priorities

With respect to shipping, the priorities of the team are:

- The safety of personnel;
- The protection of the marine environment; and
- The preservation of the ship and its cargo.

3 EMERGENCY MANAGEMENT AND RESPONSE

3.1 Spill Prevention and Management

Vessels procured by Baffinland and Baffinland staff will ensure the following is in place to prevent and respond to spills, in the unlikely even they occur:

- Comply with the *Oil Pollution Prevention Regulations* and maintain an approved Shipboard Oil Pollution Emergency Plan (SOPEP).
- Conduct exercises with the Terminal staff at regular intervals to ensure ship and shore can co-operate to minimize the damage from any spill of fuel.
- Maintain an up-to-date oil transfer record book covering the disposal of engine room sludge and the discharge of oily water through a separator.
- Maintain a separate record book for oil cargo and the treatment and disposal of cargo slops.
- Conduct exercises to test the ship and shore joint capability to handle an oil pollution incident in accordance with the provisions of the Ships' Oil Spill Response Plan and the Oil Pollution Emergency Plan – Milne Inlet (OPEP).
- Ensure that all hazardous materials are stored and handled as per information provided in Material Safety Data Sheets (MSDS).
- Ensure that all dangerous goods are transported as per requirements under the *Transportation of Dangerous Goods Act and Regulations.*

Management plans for the Project related to spill response and management include the following:

- Spill Contingency Plan
- Emergency and Spill Response Plans
- Oil Pollution Emergency Plan – Milne Inlet
- Shipboard Oil Pollution Emergency Plan[1].

Copies of Baffinland's management plans for the Project are available at www.baffinland.com.

3.2 Extreme Weather Conditions

The Ship's Master is responsible at all times for the safe navigation and operation of the vessel within the applicable laws of Canada, having special responsibility for the safety of life, the safety of the ship and the

[1] SOPEPs are developed by and for the Master of the vessel. The SOPEP is not a Baffinland Management plan. SOPEPs must meet external standards as dictated by IMO under MARPOL 73/78.

preservation of the environment. In order to meet these responsibilities, the Master has full authority to take whatever action considered necessary to successfully complete the voyage. This includes responding to extreme weather conditions and taking actions to adjust speed, seek shelter, accept assistance or deviate to save lives, as required.

3.3 Accidental Events During Shipping and Reporting Procedures

In the event of a malfunction or other incident during shipping operations within Milne Inlet, the Vessel Master will immediately inform the port emergency control system requesting such assistance as may be practical. Outside of Milne Inlet, the Master shall immediately report the incident verbally and later in writing to the nearest Transport Canada reporting station.

In the event any accidental contact occurs between a Project vessel and a marine mammal or an aggregation of seabirds, with resulting death or serious injury, the regional office of Fisheries and Oceans Canada (marine mammals) or Environment and Climate Change Canada (seabirds) is to be notified and supplied with information documenting the incident (date/time/location, affected species and condition, circumstances of the incident, weather and sea conditions, location/travel direction of the affected animal(s)). The Ship's Master will inform Baffinland Site personnel, who will contact the appropriate government agency. Annually, Baffinland will summarize any such incidents in its report to NIRB.

3.4 Unforeseen Events

During shipping operations, unforeseen events or unanticipated interactions with the environment may occur that may require intervention by the Ship's Master. Baffinland has adopted a response management strategy for all phases of the Project that will prepare Project personnel to identify, resolve and learn from any unforeseen events. One of the main principles of an effective response management strategy is to expect the unexpected and to be prepared to act quickly and decisively when it occurs. Examples of unforeseen events associated with Project shipping activities might include unanticipated startle reactions by marine mammals or unexpected attraction to ship's lighting by seabirds. If an unforeseen event were to occur, corrective actions would be taken by the Master of the vessel to avoid or reduce any adverse effects. In the case of the examples provided, these actions might include adjusting ships speed to reduce noise, or to maintain essential lighting only, in sensitive areas. Any such events, the subsequent corrective action taken and the degree of success will be documented to allow others to learn from these experiences to ensure continual improvement.

4 SHIPPING AND PORT OPERATIONS

Figure 4.1 shows the shipping routes associated with the Mary River Project. These routes have been established based on safe navigation, as well as environmental factors.

In order to ensure that all tonnage chartered for operation in Milne Inlet is in compliance with the Baffinland Shipping and Marine Wildlife Management Plan, all vessels that utilize Milne Port must comply with Baffinland environment, health and safety policies and general site rules while on route to, and while anchored within the Port.

4.1 Charter Vessel Specifications

Baffinland has established a protocol for selecting chartered iron ore carriers. The standard is identical to the specifications for dedicated iron ore carriers and includes the requirement to have appropriate ice class, Canadian Arctic class (or equivalent) and familiarity with AIRSS to operate in the ice conditions forecast to be encountered during the projected periods of the voyages into Milne Inlet.

An Ice Information Contractor will be engaged to forecast ice condition at the time of the vessel's planned loading and will advise what, if any, ice class is required.

The shipping class and types of ore carriers proposed for use are provided below:

A. Ice class designs for ore carriers include (not an exhaustive list, butbased on current knowledge of market availability):
    i) Non Ice Class (Type E)
    ii) Ice Class 1C (Type D)
    iii) Ice Class 1B (Type C)
    iv) Ice Class 1A (Type B)
    v) Ice Class 1A Super (PC 7)

B. Types of ore carriers include (not an exhaustive list, but based on current knowledge of market availability):
    i) Supramax
    ii) Panamax
    iii) Kamsarmax
    iv) Capesize

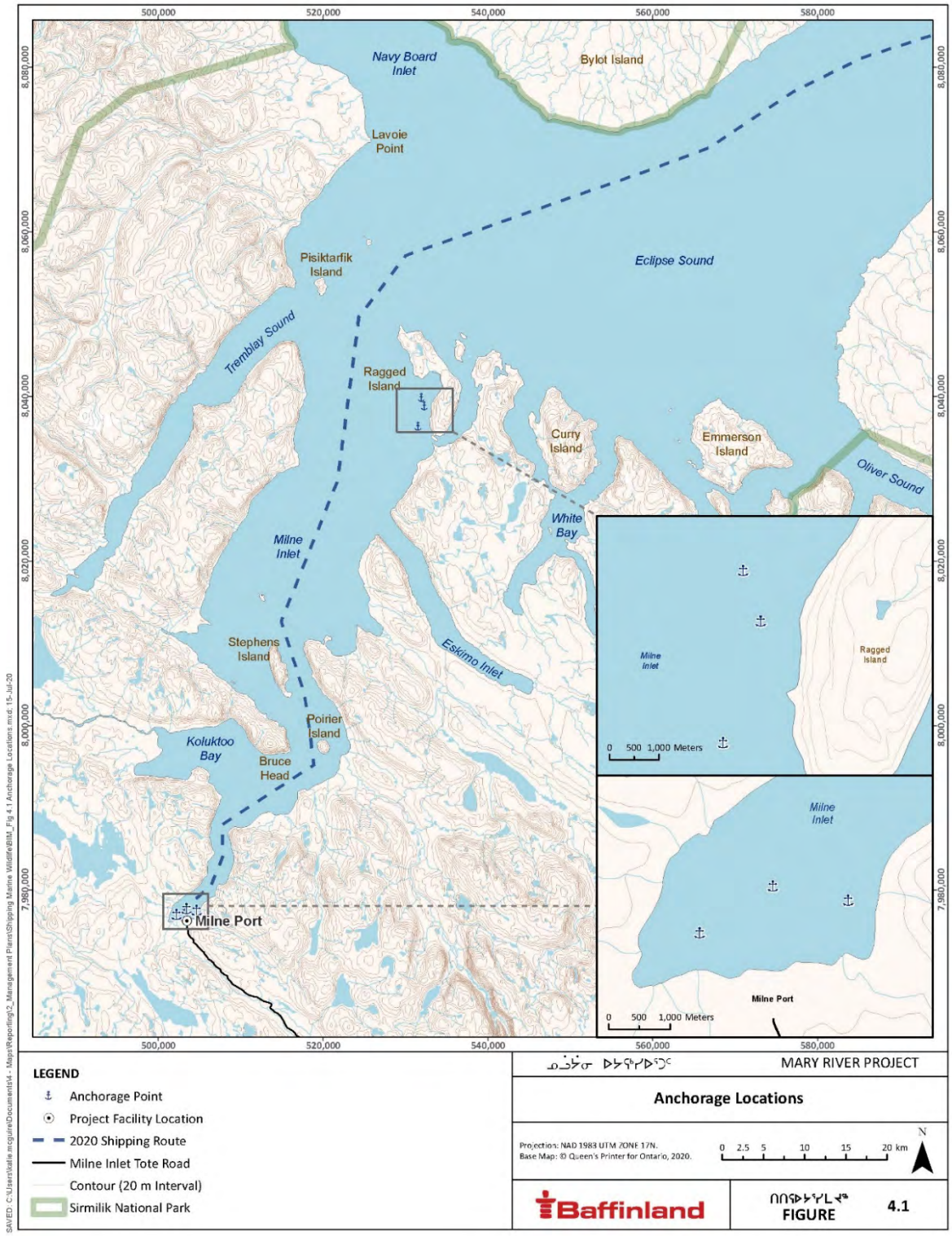

FIGURE 4.1: SHIPPING ROUTE AND ANCHORAGE LOCATIONS AS SHOWN IN THE SITM

4.1.1 Pre-Charter Audit/Inspection of Iron Ore Carriers

All foreign-registered ships entering Canadian ports are liable to be inspected by Transport Canada to ensure compliance with the regulations and to confirm that the ships are safe for their crew and the environment when they proceed to sea. All of the major shipping countries have similar port state inspections. Ships failing to pass inspection can be held until they have been repaired and achieve compliance.

Baffinland will arrange for each candidate vessel (foreign and domestic) to be assessed before being placed on charter, to ensure that the vessel is capable of operating in the ice conditions that are forecast for Milne Inlet during the period of operation. Appendix B provides a copy of the Baffinland pre-charter bulk carrier ice capability assessment. In order to ensure that the chartered vessel can load and carry the iron ores safely and efficiently, vessels that meet the required criteria for navigating in the forecast ice conditions will undergo a limited audit to ensure conformance with the ISM system before the vessel is chartered. This limited audit will be an adaptation of the ISM internal audit and the ship inspection will follow the Transport Canada port state inspection format. A copy of the Baffinland pre-charter bulk carrier inspection checklist and limited audit is provided in Appendix C.

4.2 Vessel Traffic Management

4.2.1 Navigation

Milne Inlet Port is located at latitude 71 53’ 23’’ North, longitude 80 54’ 13’’ West. All Vessels will follow the nominal shipping route as described in the Standing Instructions to Masters (SITM) (see Figure 4.1 and 4.2). The Standing Instructions to Masters is a document prepared and distributed to vessel owner/operators and Masters with detailed instructions regarding the shipping route, anchorage locations and Baffinland set restrictions to be followed when navigating through the Project area.

Specific information regarding vessel traffic management for icebreakers and shipping during shoulder seasons is outlined in Section 5 below.

4.2.2 Drifting / Anchoring

Project vessels will not anchor within the RSA along route to Milne Port except at one of the following anchorages near Ragged Island or at Milne Port (see Figure 4.1). The number of Project vessels allowed to wait, drift or anchor near Ragged Island is limited to three vessels.

4.2.3 Routing

The nominal shipping route to Milne Inlet (Figure 4.2) was developed with guidance from experienced Vessel Masters retained by Baffinland to load at Milne Port. Ultimately deviations from the shipping route may occur and as dictated by the over-riding Master’s authority and responsibility for safe navigation.

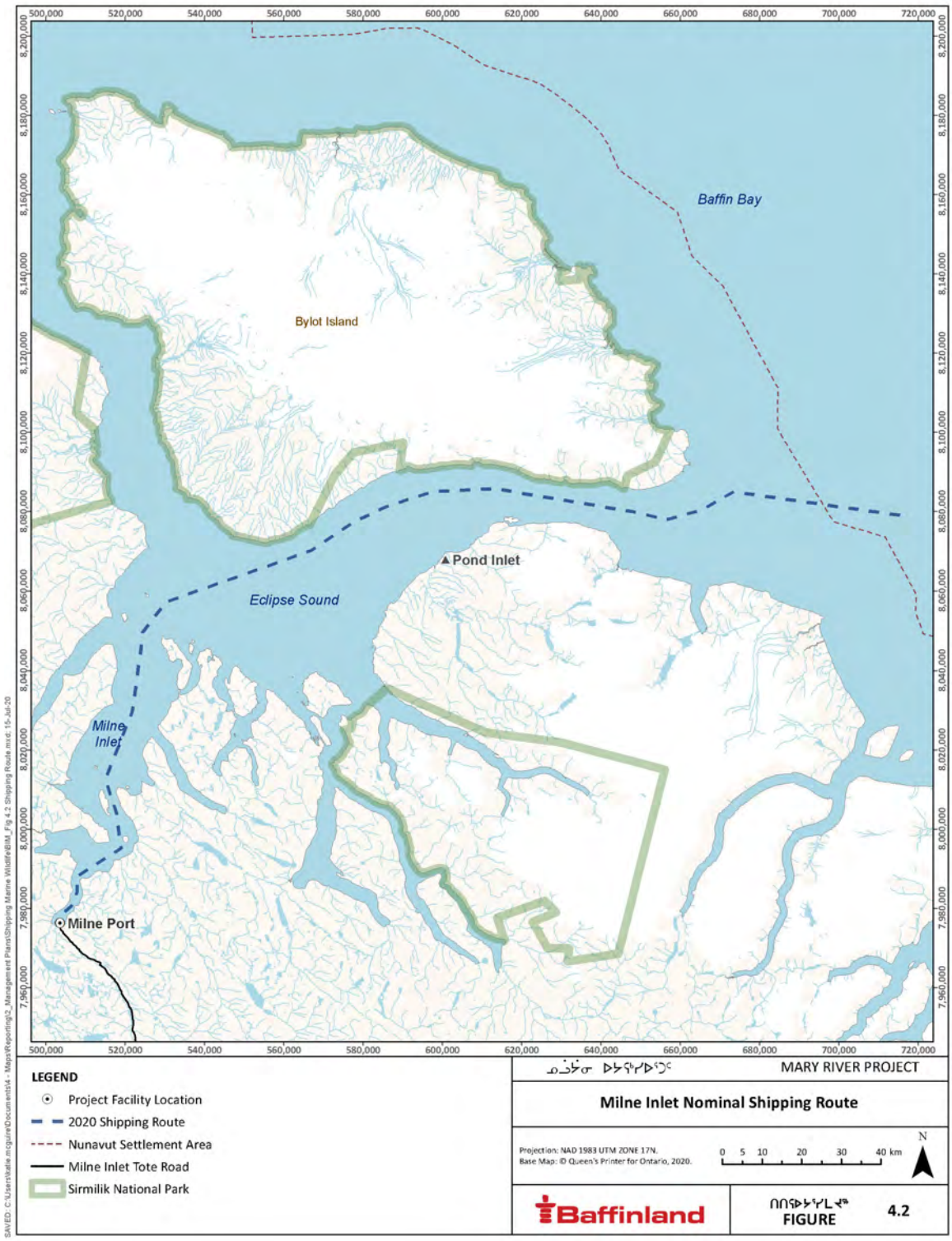

FIGURE 4.2: MILNE INLET NOMINAL SHIPPING ROUTE

4.2.4 Tug Support

Tugs operate primarily in Milne Port assisting vessels to travel from their anchorage points in Milne Port to the ore dock for loading. However, tugs may occasionally escort ore carriers between Milne Port and Ragged Island.

4.2.5 Berthing

Ore carriers are berthed with the assistance of two tugs and a Docking Master on board the vessel. All vessels are brought alongside in a safe and efficient manner to avoid contact with the berth or other hazards. A person on the berth assists in properly positioning the vessel to ensure loading operations will be most effective. Linesmen ensure the vessel is properly tied up once in position.

4.2.6 Fueling

Fuel (diesel, gasoline and jet fuel) will be delivered to Milne port by tankers which will be off-loaded into holding tanks using the commonly-employed floating hose fuel transfer method. Milne Port maintains a Transport Canada approved OPEP which is reviewed and resubmitted annually.

Port contingency and vessel-specific response plans exist to address issues relating to:

- Appropriate fuel intake devices that prevent overflows.
- Spill fuel collection and recycling or destruction facilities, where applicable.
- Infiltration and other devices including porous pavement, soak-away pits or dry wells, seepage or infiltration trenches, percolation basins, catch basins, to contain spills.

4.2.7 Summary of Communications Protocol and shipping monitors

Prior to the start of each shipping season, Baffinland will confirm with the Mittimatalik Hunters and Trappers Organization (MHTO) that the floe edge is no longer being used by hunters prior to having the first vessel enter the shipping corridor.

Communications will be maintained with local harvesters and hunters throughout the season by supplying community members with a contact information for Baffinland staff that they can engage with if there are concerns regarding Project-shipping throughout the season.

In accordance with Article 9.4 of the IIBA, Baffinland will hire also hire Inuit ship monitors. The land-based ship monitors will track Project shipping using both observational methods and tracking through AIS monitoring (see Section 6.5). Ship-monitors will also serve as key communications liaisons between community members and Baffinland.

If any incidents require reporting (i.e. fuel spill) to federal or territorial agencies, Baffinland will also contact the Hamlet of Pond Inlet and the MHTO to ensure they are aware of the details of the incident, investigations being undertaken and any actions that will occur to resolve and address the incident.

Prior to the start of each shipping season, Baffinland will consult with MHTO on the protocol for communications, lessons learnt from the past shipping season and whether any modifications to the process are required.

4.3 Construction Shipping

During construction phases of the Project, containerized equipment and materials will be shipped to Milne Inlet. Vessels will be required to follow the same instructions for navigating through Milne Port as they would for the operations phase of the Project.

4.4 Operations Shipping

During the Operations Phase, dedicated voyages carrying re-supply materials and equipment will travel to Milne Port. Fuel will be delivered by sealift tankers. Iron ore will be shipped from Milne port, using the routes presented in Figure 4.2.

Vessels are provided with specific guidance regarding their travel to site. In the SITM vessel captains are instructed to follow the shipping route and avoid areas such as Koluktoo Bay and the western shoreline near Bruce head to minimize effects on marine mammals and interference with hunting activities. The Standing Instructions to Masters also provide details regarding dedicated anchorage locations at Ragged Island and Milne Port and speed restrictions (9 knots) imposed by Baffinland to be followed while they are transiting the Northern Shipping Route.

Vessels procured for the Project operate in accordance with two primary legal instruments regulating ship traffic in the Canadian Arctic: the *Canada Shipping Act*, and the *Arctic Waters Pollution Prevention Act*, and their associated regulations (See Section 1.5).

4.4.1 Ship Loading and Unloading

Ships loaded with equipment and supplies for a full year of Project operation are docked at the Milne Port floating freight dock and unloaded either directly or via lightering barges (see Figure 4.3). Goods are stored in Milne Inlet laydown areas for transfer to vehicles that transport the goods to the Mine Site along the Tote Road. Most goods are transported in containers that will limit spills and facilitate transfer from ship to shore and transport to the Mine Site. Fuel is transported in tankers and offloaded from the moored vessel by means of floating hoses.

Fuel for shipping is to be purchased only from accredited suppliers that can provide assurance that the fuel used for shipping conforms to Canadian regulations (*Benzene in Gasoline Regulations, 1997;*

FIGURE 4.3: MILNE PORT MARINE INFRASTRUCTURE

Contaminated Fuels Regulations, 1991; Gasoline Regulations, 1990; Fuel Information Regulations, No. 1, 1999; Sulphur in Diesel Fuel Regulations, 2002; Sulphur in Gasoline Regulations, 1999).

Ship Loading Fines Ore at the Panamax Ore Dock:

The ship loader for the panamax dock is designed as a conveyance system used to fill the holds of the vessels with the ore, and has a capacity of 6,000 t/h.

4.4.2 Schedule

Annual shipping occurs seasonally over a period of approximately 90 days, roughly between July 15 and October 15 of each year. Chartered vessel will typically make one to three round trips per season. Each round trip of a ship from Milne Inlet to a port in Europe is estimated to take 25 to 27. The vessels will travel at a speed of maximum 9 knots when transiting through Eclipse Sound and Milne Inlet.

4.4.3 Safety

Baffinland requires that the ship-owner/operator of candidate vessels will have as priorities safety of life, protection of the environment, and the preservation of ship and cargo.

While Baffinland and the vessel owner/operators wish to obtain the maximum efficiency in all of the company's chartered ship operations, it is recognized that the Master of a ship has sole responsibility for the safety of the ship, crew and cargo, and the protection of the environment. The Master has the authority to adjust speed, heave to, deviate, seek shelter or enter a port of refuge to re-stow cargo or seek medical assistance should environmental conditions or the condition of the vessel, the machinery, safety of the crew or cargo require such a precaution.

Baffinland requires that candidate ship-owner/operators have a safety and operating management system based on the principles of the International Safety Management Code (ISM Code). The objective of the ISM Code is to ensure safety at sea, prevention of human loss of life or injury and avoidance of marine environment pollution. To achieve this objective, the Code requires that the ship-owner/operator share fully with the vessel personnel the responsibility to maintain a safe ship. The Code establishes a clear and concise safety management system, including, as examples, the following functional requirements:

> **A safety and environmental protection policy.** By considering the nature of the waters that vessels are to travel within, standards of watch keeping are reinforced with additional lookouts on the bridge and engineers in the machinery space. The manoeuvring ability of machinery and the operation of steering gear are tested prior to arrival or departing in a passage where navigation is restricted or where the route is close to shore. Strict measures regarding the handling and transfer of bunker and cargoes are established. Masters will be required to navigate within established channels.

Levels of authority and lines of communication defined. This ensures that safety remains a high priority and that the lines of communication between shore and ship personnel remain open. Responsibilities are clearly defined and contacts to provide the ship with round the clock shore support are mandatory.

Procedures for reporting accidents and non-conformities with the Code. The method of recording non-conformities, establishing corrective measures, and ensuring open dialogue between all parties is to be documented and reviewed.

Procedures to prepare for and respond to emergency situations. Ships must have a set of operating manuals that supplement and support regulatory requirements and vendor instructions. These manuals evolve from standard practices and procedures, and they are to be tailored to individual ships. The objective is to document and provide guidance and instruction on the safe handling and operation of all shipboard equipment. Clear instruction is provided with regard to pre-arrival and departure check lists, navigation, handling of cargoes, bunkering, stability conditions, and the stresses imposed and acceptable to each concentrate carrier. The manuals are a concise guide for both ship and shore personnel to ensure safe operation, with emergencies considered and responses planned.

In addition, ship and shore personnel engaged in operations must be aware of hazards arising from cargo operations and from the materials and iron ores being handled. This includes the provision of Safety Data Sheets (SDS) information and any additional training required.

4.4.3.1 Safety of Persons Using Small Boats in the Shipping Route

Subject to ship and human safety considerations, mitigation measures to safeguard the safety of those in small boats will include the following:

- Barge-tugs or ships will restrict themselves to the recommended shipping route thereby not surprising any small boat travelling outside the shipping route;
- The ship will sound its horn if a small boat seems unaware of its presence; and
- Baffinland will inform communities of planned shipping transits both prior to the start of the shipping season and in real-time via AIS monitoring data available at MHTO office and on the Baffinland website (www.baffinland.com).

5 ICE MANAGEMENT AND ICE BREAKING ACTIVITIES

5.1 Standard Definitions

For the purpose of management plan the following definitions of 'ice conditions' are applicable:

Landfast Ice (Fast ice): Ice that forms and remains fast along the coast.

Mobile ice/Mobile pack: Ice that is not consolidated and may drift with winds and currents.

Concentration: Ration expressed in tenths (/10) describing the area of water surface covered by ice as a fraction of the whole area.

Grey-White Ice: Sea ice between 15cm and 30cm

Break-up: Moment when ice starts to fracture in late spring or summer.

Freeze-up: Moment when the freezing process begins in fall or early winter.

Open Water: Are of freely navigable water in which ice can be seen in concentrations less that 1/10 (traces)

5.2 Ice Management and Icebreaking Activities

A combination of ice management and icebreaking activities will be required to allow for the safe passage of vessels at the start and end of the shipping season. Ice management is considered the act of preventing ice floes or icebergs from making contact with vessels and port infrastructure at Milne Port. Icebreaking activities will involve the use of a designated icebreaking vessel to facilitate the passage of lesser ice class vessels through prevailing ice conditions (i.e. ice escort services). Ice management will typically occur when there are icebergs or smaller ice floes in an area while icebreaking will be necessary to facilitate passage through much heavier ice concentrations.

Icebreakers aim to avoid the heaviest ice concentrations areas during transits along the Northern Shipping Route. During the periods of ice freeze-up and ice break-up during the shipping shoulder seasons, the Master or Ice Navigator on the icebreaker optimizes the use of leads in the ice to facilitate safe vessel passage and to limit fuel consumption. Interaction of the icebreaker with very close ice and compact ice is possible during the shoulder seasons but only if the ice is mobile (comprised of mobile ice floes as opposed to landfast ice). Ice thickness is another critical component of an icebreaker's ability to engage ice.

Refueling of icebreakers will occur at Milne Port using ship-to-ship fuel transfer between the icebreaker and a fuel tanker. Once Project tug vessels arrive at Milne Port, they will remain there for the duration of the shipping season. In addition to ice management services, the tug vessels will escort Project vessels

between Milne Port and Ragged Island during the open water season as a precaution against other possible risks and malfunctions associated with shipping (e.g., vessel loss of power).

5.2.1 Shipping Routes During Shoulder Seasons

Along the Northern Shipping Route, the Icebreaker Master or Ice Navigator will determine the best travel route between the entrance of Pond Inlet and Milne Port based on local ice conditions at the time of transit. As ice conditions will vary from year to year, it is not possible to define a permanent route during the shoulder seasons with any level of accuracy. It is possible that transits during the shoulder seasons may deviate from the nominal open water shipping route (as defined in the Standing Instructions to Masters) by > 5 nautical miles (nm) if dictated by ice conditions. However, ships will not enter any restricted areas unless it is a matter of safety from extreme conditions (i.e. storms, large multi-year ice floes that become mobile and threaten navigational safety).

5.2.2 Icebreaker Operations During Shoulder Seasons

Icebreakers will maintain sustained travel speeds of no greater than nine (9) knots within the prescribed area, however, temporary and localized increases in speed may be required from time to time to break through larger ice floes and allow vessels under escort to safely follow. As aforementioned, up to two icebreakers and ten tugs will be required to support shoulder season shipping. Vessels will be sourced from the available market and could be either domestic or international.

The shoulder season shipping windows will vary from year to year based on local ice conditions. Since ice conditions vary from year to year, it is not possible to predict an accurate number, frequency and duration of expected transits for each shoulder season. Timing for the start of the 2021 shipping season will be determined by confirmation that a continuous shipping path of 3/10ths ice concentrations or less is available along the Northern Shipping Route. Local ice conditions at the time of transit will dictate which vessels can enter the region, how many vessels can be escorted by the icebreaker, and how long the transit will take.

5.2.3 Vessel Information

The suite of vessels for the shipping season will be a function of vessel commercial availability required for the anticipated ice conditions at different points of the shipping season. As such, an exact shipping schedule which outlines the number of vessels during each period of the shipping season year over year is not possible to provide. The shipping season will be maximized each year based on commercial availability of vessels and weather conditions. The shipping class and types of icebreakers and ore carriers proposed for use are provided below:

A. Ice class designs for ore carriers include (not an exhaustive list, but based on current knowledge of market availability):

   i) Non Ice Class (Type E)

ii) Ice Class 1C (Type D)

iii) Ice Class 1B (Type C)

iv) Ice Class 1A (Type B)

v) Ice Class 1A Super (PC 7)

B. Types of ore carriers include (not an exhaustive list, but based on current knowledge of market availability):
C. Supramax ~55,000 DWT
D. Panamax ~75,000 DWT
E. Kamsarmax ~80,000 DWT
F. Post Panamax ~95,000 DWT

5.2.4 Ice Navigation

Ice conditions along the Northern shipping route to Milne Inlet (Enfotec, 2016) are as follows:

- The nominal open water season is from August 5th to October 15th (71 days).
  - On some years, it is expected that a shoulder window will allow the shipping season to be extended beyond the high confidence shipping window for certain classes of ships. This will need to be assessed on a year-by-year basis as there is high variability in terms of length and timing of the shoulder period.
  - Provision for access to icebreaking services will be strongly recommended for all 'Type' vessels as well as Polar Class 6 and 7 ships during the shoulder periods at the beginning and the closing of the season. In comparison, Polar Classes 5 and higher can engage ice and face a certain amount of pressure on the ice cover.
  - Type E vessels (no ice class) are not meant to encounter any significant amount of ice at all. The high confidence shipping window is therefore defined as the average period of open water, about August 5th to October 15th (71 days), with a shoulder window possibly extending the season by about a week. Extending the season will likely require an icebreaker escort.
  - Type B, C and D and Polar Class 7 vessels can encounter a certain amount of ice. The high confidence window is from August 5th to October 15th (71 days), with an additional shoulder window that can add 10 to 30 days to the season, depending on the ice class. Extending the season will likely require an icebreaker escort.
  - Type A and Polar Class 6 vessels have a slightly longer high confidence shipping window, from July 25th to October 15th (82 days) and the shoulder window can extend the season by up to 25 days. Extending the season might require an icebreaker escort.

- Polar Class 5 vessels can navigate with high confidence from July 20th to December 31st (164 days), with a shoulder window possibly extending the season through January. Vessel speeds are expected to be lower from mid-November onward.
- Polar Class 4 vessels can navigate with high confidence from June 15 to February 15 (246 days), with a shoulder window covering the rest of the year. Indeed, the combination of substantial ice thickness and heavy pressure in western Baffin Bay is likely to result in slow progress and possible interruptions through the voyages from early or mid-February to late May or even mid-June.

5.2.4.1 Ice Navigators

When regulations and safe operation require an Ice Navigator will be placed aboard each vessel. An Ice Navigator is a qualified Officer who has several years of experience navigating vessels in ice infested waters, Canadian Arctic Waters, and elsewhere. Onboard the chartered ship, his duties are advisory only and his principal responsibility is to provide the Master with advice with regard to the navigation of the vessel into and outward from Milne Inlet, in the areas north of 60 degrees latitude, as well as anywhere sea ice can be present. It is intended that the Ice Navigator will join each chartered vessel at the last port of discharge, prior to the vessel's departure for Milne Inlet. The Ice Navigator will remain onboard for the duration of the voyage, leaving the vessel after the vessel arrives in the designated discharge port. Among the Ice Navigators duties will be to ensure the chartered vessel is capable of entering and safely operating in Milne Inlet.

After boarding, the Ice Navigator will convene a meeting with all watchkeepers wherein they may wish to discuss various aspects of their role onboard and general information regarding navigating in potential ice. The Ice Navigator shall verify that the vessel has up to date charts and nautical publications required to be onboard in accordance with governing regulations. Ultimately it is the Owners' responsibility to ensure the proper charts and publications are onboard. The Ice Navigator will witness the safe and reliable operation of the machinery and familiarize themselves with the manoeuvrability of the vessel, the change out of ballast, and will report any apparent deficiencies to Fednav International. The Ice Navigator shall provide the Master with advice on safe navigation in ice covered Canadian waters, coastal navigation and environment protection procedures in Canadian Arctic Waters & loading at Milne Inlet.

Furthermore, an Ice Navigator may among other duties:

- Assist the Master to understand and complete the required environmental procedures.
- Verify that the vessel has the required Canadian Charts and Publications as specified by Canadian Regulations, and that all are the latest edition and corrected up to date.
- Advise the Master in the navigation of the vessel though ice prone areas en route to Milne Inlet.
- Coach and train the crew as necessary on detecting and avoiding glacial ice features, in a variety of sea and ice conditions.

- Assist the Master in completion of navigation safety and ice entry checklists; and
- Assist the Master in establishing communications with ECAREG and/or NORDREG and with the Milne Inlet site personnel.
- Advise/assist the Master in berthing the vessel alongside the Milne Inlet facility in the event the Milne Inlet Port Docking Master cannot attend on-board.
- Act as facilitator between ship and shore reloading procedures.
- Assist the Master in cargo, customs and immigration documentation for arrival and sailing from Milne Inlet.

5.2.4.2 Transiting In Ice-Infested Waters

It is expected that ice could be present on the approaches to Milne Inlet at any time during the season (especially at the beginning and at the end of the shipping season).

In the event of ice being present in the approaches to Milne Inlet, the vessel is to be navigated according to the principles defined in the *Canadian Ice Regime Shipping Control System.* The Ice Navigator will be conversant with this system and will provide information as to its application.

For the purpose of implementing icebreaking mitigation measures, ice conditions in the RSA will be verified by the Ice Navigators onboard vessels, on a daily basis, using up to date ice charts, satellite imagery and ice reconnaissance from the bridge. In addition, ice conditions in the RSA will be verified by Fednav on a daily basis using the Canadian Ice Service's Daily Ice Charts and satellite imagery. For the avoidance of doubt and to ensure more timely information on ice conditions, the daily ice charts will be used as a guide, however the ultimate opinion of ice coverage will be made by Ice Navigator onboard vessel.

It should be noted that while there may be an Ice Navigator onboard who is familiar with the conditions the vessel might encounter, the responsibility for the safe prosecution of the voyage rests solely with the vessel's Master.

When landfast ice is present, operations will not be executed along the Northern Shipping Route, and ore carriers will be prevented from rendering a positive ice numeral.

5.3 Criteria Used by Baffinland To Initiate Shipping Season

Baffinland will rely on several criteria for determining the start of each annual shipping season, including information on prevalent ice conditions based local land use activities and several technical and environmental determinants, as defined further below:

5.3.1 Community

Baffinland's first priority is to confirm shipping activities will not pose a safety issue for local land users.

- Before commencing shipping operations Baffinland (Sustainable Development) must receive written confirmation from the Mittimatalik Hunter and Trappers Organization (MHTO) that the floe edge has been closed for hunting.

5.3.2 Environmental

Each season's shipping activities will be governed by prevailing ice conditions and a commitment that landfast ice must have broken along the entire shipping corridor prior to commencement of icebreaking and ice management operations.

- In 2021, Baffinland Shipping Department must confirm that a continuous path of 3/10ths ice concentrations along the Northern Shipping route is available. Baffinland's Shipping Department will use up to date ice charts and satellite imagery to make this determination.

5.3.3 Vessel Safety

Navigation in waters under Canadian Jurisdiction north of 60° North Latitude is governed by the Arctic Shipping Safety and Pollution Prevention Regulations (ASSPPR), under the provision of the Arctic Waters Pollution Prevention Act (AWPPA). ASSPPR incorporates by reference the international Polar Code.

ASSPPR includes the obligation to employ an approved risk assessment tool to validate the capability of a vessel to navigate safely in prevailing ice conditions. The Arctic Ice Regime Shipping System (AIRSS) and POLARIS were developed as tools to be used by each ship's Captain or Ice Navigator (i.e., ice pilot) to validate accessibility of a vessel through a given area based on prevailing sea ice conditions. This process is described in more detail in Section 3 of TSD 16 (Enfotec, 2016).

- Define Regimes present along the Northern Shipping Route through review of satellite imagery, Canadian Ice Service's Daily Ice Charts, Canadian Coast Guard Ice Conditions reports, and ice observations conducted by Ice Navigators on board.
- Calculate the Ice Numerals for all Ice Regimes present along the Shipping Route by calculating the sum of the concentration in tenths of each Ice Regime and the Ice Multiplier associated with the ice type and the class or type of vessel.
- Vessel Captain transmits Ice Regime Routing Message to NORDREG to obtain permission for navigation along the route.
- Vessel Captain and Ice Navigator confirm passage with Port Captain and Vessel Captain of Ice Breaker escort.

5.3.4 Ecological

No icebreaking operations will occur during the ringed seal parturition, nursing, or breeding period (i.e. between March to April). There will be some overlap between icebreaking operations and narwhal during their seasonal migratory movements (i.e. between early-July to mid-August) in the Regional Study Area and the mitigation measures in the following subsection have been developed to reduce the potential effects of this overlap.

- Baffinland will not break ice during the ringed seal parturition, pupping and nursing periods and will manage its vessel traffic during the Eclipse Sound narwhal summer stock spring migratory period.

5.4 Instructions To Escort Vessels

The following instructions assume all the criteria Baffinland uses to initiate the shipping season have been met.

1. The Vessel Captain on-board the ice breaker will assess the concentrations of ice using best available resources to determine vessel escort limitations.
2. Once the concentration is assessed, the on-board personnel will report the concentration to the Port Captain to enable the Port Captain to properly manage the vessel traffic. The possible scenarios are as follows:

   i) If the ice breaker encounters greater than 6/10 concentration of ice or more, and ice cannot be avoided during the transit, once the icebreaker has finished its transit, the vessel will wait until 24 hours has passed since escort operations began before commencing a new transit.

   ii) If the ice breaker encounters 4/10 to 6/10 concentration of ice along a transit but no greater, the ice breaker may complete the transit and start a second transit immediately thereafter. If both transits are completed in less than 24 hours, the icebreaker will wait until a period of 24 hours has passed since the first transit began before commencing a third transit. That third transit will be the first in a new cycle (i.e. a 24-hour period).

   iii) If the vessel encounters 3/10 or less of ice, or is able to transit without breaking ice, normal operations will resume, which may or may not include using the icebreaker to escort vessels.

3. The 24-hour period under these mitigation measures commences at the time the vessel crosses into the RSA and/or departs Milne Port.

5.5 Temporary Additional Mitigation for the 2021 Shipping Season

Baffinland will delay shipping in 2021 until there is a continuous path of 3/10ths or less ice concentration along the Northern Shipping Route. See Appendix D (the Narwhal Adaptive Management Response Plan) for more details.

5.6 Instructions to Vessels Entering/Exiting The RSA During Implementation of Mitigation Measures

The following instructions assume all the criteria Baffinland uses to initiate the shipping season have been met.

- The vessels will inform the Port Captain when they are permitted to enter the RSA based on the ice class of their respective vessels.
- The Port Captain will issue and adjust the vessel schedules and instructions depending on the ice concentrations and associated transit limitations.
- For the vessels being escorted, the Port Captain will notify them as to when and where to meet the icebreaker to begin escort operations.
- For the vessels sailing without icebreaker assistance, the Port Captain will notify them at which time they can enter the RSA or depart from Milne Inlet.
- When more than one vessel is entering or exiting the RSA at a given time, the vessels shall proceed in a single line-up, while keeping a safe distance between vessels.

Vessels awaiting an icebreaker escort, or vessels awaiting instructions from the Port Captain to enter the RSA will be instructed to wait in Baffin Bay at least 40 km east of the Nunavut Settlement Area (see Figure 5.2). If an entrance delay is expected, vessel captains may anchor, at their own discretion, at a known anchorage location within Baffin Bay identified as Store Hellefiskebank (see Figure 5.3).

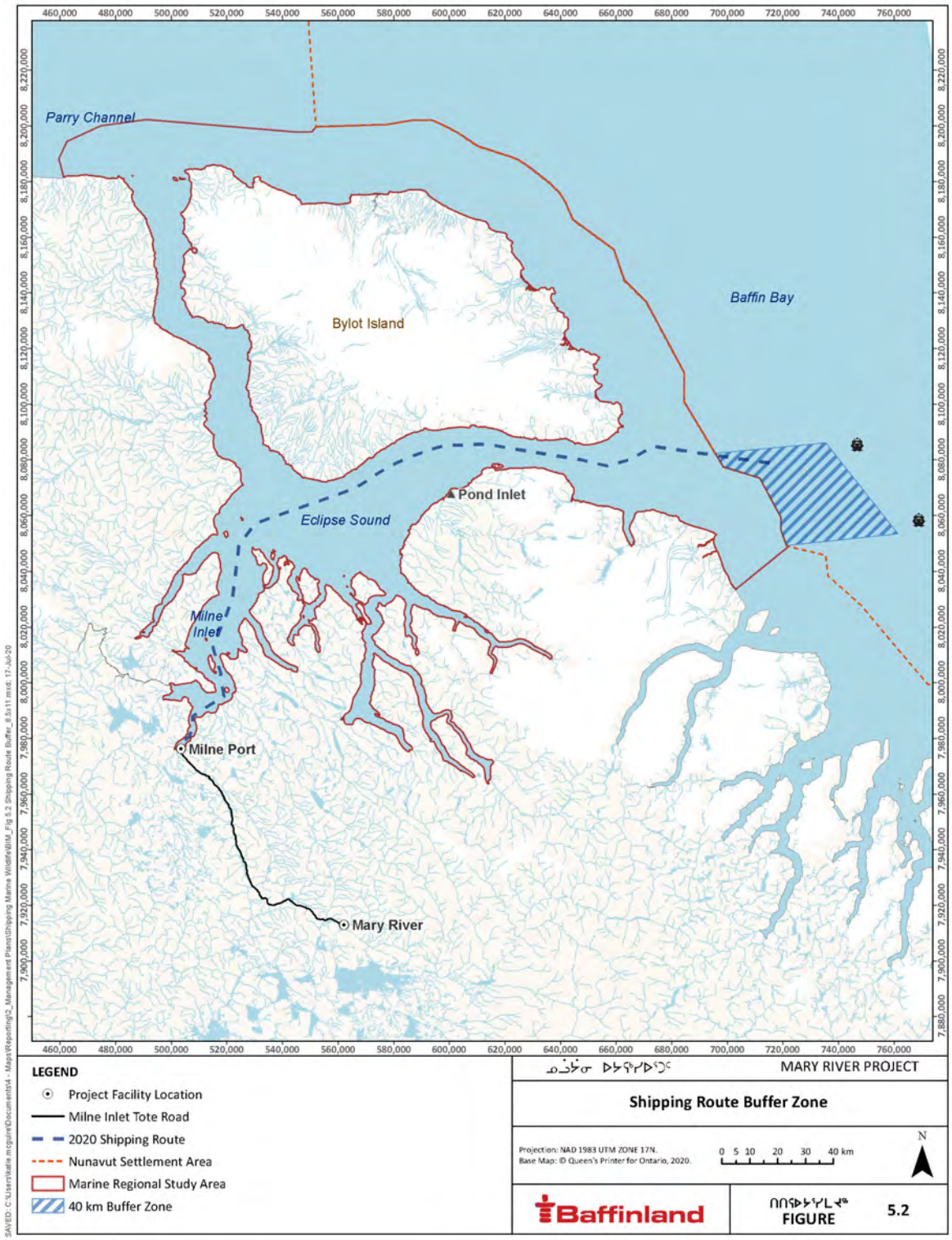

FIGURE 5.1: SHIPPING ROUTE BUFFER ZONE

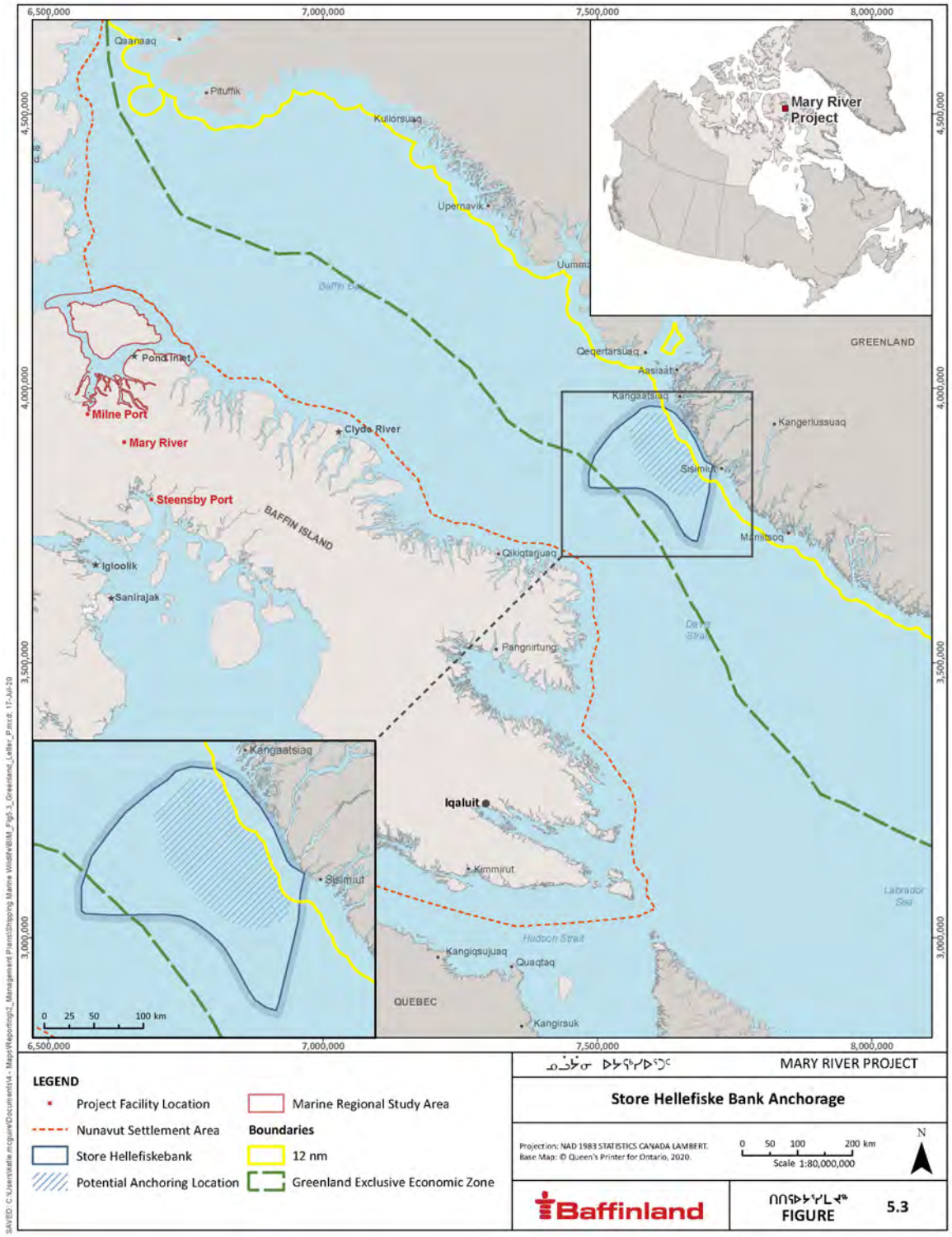

FIGURE 5.2: STORE HELLEFISKEBANK ANCHORAGE LOCATION

6 ENVIRONMENTAL MANAGEMENT

6.1 Fish Habitat Protection

The authority for the management and conservation of fish and fish habitat in Canada is contained in the federal *Fisheries Act*. DFO is the federal agency responsible for managing Canada's fisheries through the *Fisheries Act*. The fisheries protection provisions of the *Fisheries Act* establish regulatory requirements for the protection of fish and fish habitat through the prohibition of serious harm to fish that are part of, or support, a commercial, recreational, or Aboriginal (CRA) fishery set out in subsection 35(1) of the Act.

Serious harm to fish is defined under Section 2 of the *Fisheries Act* as "the death of fish or any permanent alteration to, or destruction of, fish habitat". This definition is refined in the Fisheries Protection Policy Statement (DFO, 2013a) as follows:

- A permanent alteration to fish habitat of a spatial scale, duration, or intensity that limits or diminishes the ability of fish to use such habitats as spawning grounds, or as nursery, rearing or food supply areas, or as a migration corridor, or any other area in order to carry out one or more of their life processes; and
- The destruction of fish habitat of a spatial scale, duration, or intensity that fish can no longer rely upon such habitats for use as spawning grounds, or as nursery, rearing or food supply areas, or as a migration corridor, or any other area in order to carry out one or more of their life processes.

6.2 Marine Mammals

Project shipping and port operations have the potential to interact with marine mammals and their habitats with potential for adverse effects on these receptors. Project activities of concern include vessel discharges (ballast water), vessel movements, vessel noise and vibration, and accidental spills and releases. Vessel strikes on marine mammals have the potential to result in direct mortalities or injury.

In addition to the mitigation measures for marine mammals outlined in Table 2 below, potential adaptive environmental management measures that might be considered could include4/ such actions as:

A. Changes in the frequency and timing of shipping during periods of the year when interactions are found to be most common; or
B. Identification of alternate routing.

All vessels are to follow the nominal shipping route (See Figure 4.2) to the fullest extent possible and avoid such areas such as Koluktoo Bay and the western shoreline near Bruce Head (see Figure 6.1) to minimize effects on marine mammals and interference with hunting activities.

FIGURE 6.1: RESTRICTED SHIPPING AREA

All Project vessels will restrict speed to 9 knots when transiting along the established shipping corridor, and will be operated in such a way as to avoid separating an individual member(s) of a group of marine mammals from other members of the group. When marine mammals appear to be trapped or disturbed by vessel movements, the vessel will implement appropriate measures to mitigate disturbance, including stoppage of movement until wildlife move away from the immediate area.

TABLE 2: MITIGATION MEASURES FOR MARINE MAMMALS FOR 2021

Project Activity	Mitigation Measure(s)	Species
Vessel traffic to/from Milne Port	• Maintain constant speed and course when possible. • Reduce vessel speed to 9 knots. • Reduce vessel idling • Additional temporary measures have been introduced for 2021 that shipping will not commence a continuous path of 3/10ths or less ice concentrations between the entrance of Eclipse Sound and Milne Port is present. • No breaking of landfast ice will occur in the spring or fall shoulder season. • When marine mammals appear to be trapped or disturbed by Project vessel movements, the vessel will implement appropriate measures to mitigate disturbance, including stoppage of movement until wildlife move away from the immediate area (as safe navigation allows). • All Project vessels will be provided with standard instructions to operate their vessel in a manner that avoids separating an individual member(s) of a group of marine mammals from other members of the group; • All Project vessels will be provided with standard instructions to not approach within 300 m of a walrus or polar bear observed on sea ice; • Vessels awaiting instructions from the Port Captain to enter the RSA will be instructed to wait in Baffin Bay at least 40 km east of the Nunavut Settlement Area.	Ringed Seal, Bearded Seal, Walrus, Beluga, Narwhal, Bowhead Whale, Polar Bear

It is important to note that none of the aforementioned mitigations related to vessel movement, should be read in any way as over-riding the Master's authority and responsibility for safe navigation and management of the vessel.

6.3 Onboard Waste Management

All vessels are to have Waste Management Plans for sewage and solid waste.

6.3.1 Sewage and Grey Water

All ore carriers are to be fitted with a holding tank with sufficient capacity to meet the grey and black water requirements of the ship for the duration of its time in the RSA. Ore carriers are not to discharge effluent from treated or untreated sewage or grey water while in the RSA.

6.3.2 Solid Waste

In accordance with MARPOL and the *Arctic Waters Pollution Prevention Act*, no solid waste materials or garbage is to be disposed of in Canadian waters. As no facility exists to dispose of foreign or Canadian ship waste materials or garbage at Milne Port, such materials will either be incinerated or retained on-board and later disposed of in accordance with Canadian and International regulations.

6.4 Invasive Species Management

6.4.1 Ballast Water Management

In order to reduce or eliminate the risk of invasive aquatic species and pathogens being introduced into Canadian waters as a result of shipping, all ships will exchange ballast water in accordance with the *Ballast Water Control and Management Regulations* (Transport Canada 2006). The regulations require that ships transiting to Canadian ports exchange ballast water at sea in deep water away from coastal zones. This measure limits the potential for foreign harmful aquatic organisms or pathogens to be released in Canadian waters where they may colonize. Vessels are required to adhere to the Ballast Water Control and Management Regulations and will follow their own Ballast Water Management Plan (BWMP). Additionally, chartered vessels will be required to follow protocols for ballast water management and discharge as outlined in Baffinland's Ballast Water Management Plan.

6.4.2 Anti-Fouling Management

In order to reduce or eliminate the risk of invasive aquatic species and pathogens being introduced into Canadian waters as a result of ship hull biofouling, an anti-fouling coating will be in applied to the hulls of all Project vessels that will arrive and depart from Milne Port. The anti-fouling coating used will comply with the anti-fouling convention as well as be approved under the Pest Management Regulatory Agency of Canada and Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals (2007-86). This convention prohibits the use of dangerous organotin chemicals in anti-fouling systems. Any anti-fouling system that has a component listed under Annex I of the convention will not be used. The potential anti-fouling systems include:

- Organotin-free polishing type paint
- Organotin-free ablative type paint
- Organotin free conventional type paint

- Biocide-free silicon type paint
- Other biocide-free paints

As the iron ore carriers commissioned for operations will exceed 400 gross tonnes and will be undertaking international voyages, these vessels will require an international anti-fouling system certification. Baffinland is committed to ensuring all vessels procured for the Project meet the IMO International Convention on the Control of Harmful Anti-fouling Systems on Ships. As per Annex I of the convention (and Schedule 6 of the Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals [2007-86]), the anti-fouling system will:

- Not bear organotin compounds on their hulls or external parts or surfaces; or
- Bear a coating that forms a barrier to such compounds leaching from the underlying non-compliant anti-fouling systems.

6.5 Automated Identification System (AIS) Vessel Tracking

Project vessel transits along the Northern Shipping Route are tracked and recorded using a combination of shore-based and satellite-based Automated Identification System Data. Automated Identification System transponders are mandatory on all commercial vessels >300 gross tonnes and on all passenger ships. Information provided by the AIS includes vessel name and unique identification number, vessel size and class, position and heading, course, speed of travel, and destination port.

Satellite-based Automated Identification System data acquired from exactEarth Ltd. was used to track Project vessel movements along the shipping corridors in real-time. In 2018 Baffinland also installed a shore-based real-time satellite-based Automated Identification System vessel tracking system at the Pond Inlet HTO main office.

6.5.1 Culture, Resources and Land Use

Ship locations are posted on the Baffinland Iron Mines website (www.baffinland.com) and available at the MHTO main office in Pond Inlet.

Additionally, Baffinland employs 2 land-based shipping monitors to work in Pond Inlet who will be responsible for conducting live monitoring throughout the shipping season and has established communication protocols and designate contact information to respond to community concerns.

These processes will help to increase response time to correct vessel movement or speed in the event of non-adherence to vessel management protocols.

6.6 Environmental Monitoring

Baffinland's marine-based monitoring programs are focused on the interaction between Project activities and the receiving marine environment, and in the establishment of cause-effect relationships that flow

from these interactions. Monitoring results provide information that serve to modify, add, or eliminate mitigation measures. Additional monitoring programs may be developed, if required, and could lead to the implementation of adaptive environmental management measures.

Environmental monitoring is conducted at three levels:

- **Research** – studies to establish basic monitoring parameters (e.g. natural variability; potential for project-environment interaction), or to establish a baseline for future monitoring;
- **Surveillance** – studies to record natural environment phenomena and act as an "early warning" of changes, which, while not attributable to the Project, could require attention and possible design of a specific EEM program;
- **EEM** –environmental effects monitoring (EEM) based on a statistically robust study design capable of accepting or rejecting a Null Hypothesis, and focused on establishing a cause/effect relationship between environmental phenomena and Project attributes.

Environmental compliance monitoring is also carried out to demonstrate that the conditions of applicable permits and approvals (e.g. with respect to limits on concentrations of discharges) have been met during in-water or near-water marine-based Project works.

Detailed information on Baffinland's monitoring programs are outlined in Baffinland's Marine Monitoring Plan. This plan is intended to provide detailed information on program design and monitoring procedures for all of Baffinland's monitoring programs. This Plan is intended to be regularly updated based on program design modifications that are required based on annual monitoring results and/or recommendations provided by the MEWG and the NIRB.

In design and execution of its monitoring programs, Baffinland is committed to applying rigorous standards for study design, analysis and reporting. All study designs are provided to the MEWG for review and comment. All monitoring data are analyzed rigorously by experienced analysts, and all draft monitoring reports are circulated to the MEWG for comment prior to issuance as final documents. Additionally, affected communities will continue to be consulted on study design and provided opportunities to participate in implementation of the monitoring programs. Monitoring results are regularly presented to community advisory groups for discussion. In all monitoring programs, Baffinland engages direct Inuit participation in study planning, execution and interpretation of results.

7 ENVIRONMENTAL REPORTING

7.1 Reporting Requirements

All marine and Project operations monitoring activities and reports pursuant to the Project Certificate and various regulatory requirements of the Project will be submitted annually to the NIRB. All results are to be kept and maintained throughout the life of the Project and EIS and EEM predictions will be updated as new baseline information is collected. A Project-specific web page (www.baffinland.com) has been developed as a means of making all non-confidential monitoring and reporting information available to the general public. To the fullest extent possible, all results will be available in English and Inuktitut.

Additionally, prior to the start of each shipping season, Baffinland will provide to the NIRB a Marine Shipping and Vessel Management Report informing the Board of the following:

- Anticipated number of ship transits along the approved shipping route;
- Identification of specific areas to be used for drifting and anchorage of vessels with details of how community feedback and comments from the MEWG has been used to inform the selection of suitable areas;
- Timelines for organizing pre- and post-shipping meetings with the community;
- Plans for preventing or mitigating vessel interference with marine mammals and traditional hunting activities pursuant to Term and Condition 125(as) of the Project Certificate;
- Evidence of community involvement to review preliminary results of the monitoring programs, and to compare results with experiences of community members and hunters with respect to the marine environment and marine mammals during the shipping season; and
- Evidence of reporting new or non-native species identified as a result of Aquatic Invasive Species Monitoring to the MHTO and DFO with confirmation of whether or not this species had been observed in the past or through other community or regional monitoring initiatives.

8 REFERENCES

Baffinland Iron Mines Corporation (Baffinland), 2012. Mary River Project – Final Environmental Impact Statement. Volume 8: Marine Environment. Appendix 8A-2. Marine Mammal Baseline. February 2012.

Baffinland Iron Mines Corporation (Baffinland), 2013. Mary River Project – Addendum to the Final Environmental Impact Statement.

Baffinland Iron Mines Corporation (Baffinland), 2015. *Spill at Sea Response Plan.* August 7. Document # BAF PH1 830 P16 0042, Rev. 0.

Baffinland Iron Mines Corporation (Baffinland), 2016. *Marine Monitoring Plan*. March 17. Document # BAF-PH1-830-P16-0046 Rev 0.

Baffinland Iron Mines Corporation (Baffinland), 2016a. *Oil Pollution Emergency Plan - Milne Inlet*. July 10. Document # BAF PH1-830-P16-0013 Rev.2.

Baffinland Iron Mines Corporation (Baffinland), 2017. *Emergency Response Plan*. March 31. Document # BAF PH1 840 P16 0002, Rev. 2.

Baffinland Iron Mines Corporation (Baffinland), 2017a. *Spill Contingency Plan*. March 30. Document # BAF-PH1-830-P16-0036, Rev. 3.

Baffinland Iron Mines Corporation (Baffinland), 2018a. *Mary River Project – Addendum to the Final Environmental Impact Statement for the Phase 2 Proposal*. August 2018. Revised September 2018.

Baffinland Iron Mines Corporation (Baffinland), 2018b. Phase 2 Proposal Information Request Supporting Document: Overview of Marine Operations. Baffinland 2019. Ballast Water Management Plan. March 31. Document # BAF-PH1-830-P16-0050 Rev 1.

Baffinland Iron Mines Corporation (Baffinland), 2019. Ballast Water Management Plan. March 31. Document # BAF-PH1-830-P16-0050, Rev. 1.

Enfotec Technical Services Inc., 2016.Technical Supporting Document (TSD) No. 16: Ice Conditions and ship access to the Milne Inlet port site – Update. Mary River Project – Phase 2 Proposal. Report submitted to Baffinland Iron Mines Corporation. Reference No. 2016-BAFFINLAND-01. December, 2016.

Transport Canada, 2007. A guide to Canada's ballast water control and management regulations. TP 13617E. Environmental Protection. 46p.

World Meteorological Organization (WMO), 2014. *Sea Ice Nomenclature.* volume 1 – Terminology and Codes, Volume II – Illustrated Glossary and III – International System of Sea-Ice Symbols) No.259.

Appendix A:
International and Federal Shipping Regulation and Act

Federal and/or International Acts and Regulations	Reference
Aids to Navigation Protection Regulations	https://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1403/index.html
Arctic Waters Pollution Prevention Act and Regulation	http://www.tc.gc.ca/eng/marinesafety/debs-arctic-acts-regulations-awppa-494.htm
Ballast Water Control and Management Regulations.	https://laws-lois.justice.gc.ca/eng/regulations/sor-2011-237/
Canada Labour Code	https://laws-lois.justice.gc.ca/eng/acts/L-2/
Canada Shipping Act	https://laws-lois.justice.gc.ca/eng/acts/c-10.15/
Canadian Transportation Accident Investigation and Safety Board Act	https://laws-lois.justice.gc.ca/eng/acts/c-23.4/
Canadian Transportation Act	https://laws-lois.justice.gc.ca/eng/acts/c-10.4/
Canadian Transportation of Dangerous Goods Act	http://www.tc.gc.ca/eng/tdg/act-menu-130.htm
Cargo, Fumigations and Tackle Regulations	https://laws-lois.justice.gc.ca/eng/regulations/sor-2007-128/
Charts and Nautical Publications Regulations	https://laws-lois.justice.gc.ca/eng/regulations/sor-95-149/
Classed Ships Inspection Regulations	https://laws-lois.justice.gc.ca/eng/regulations/SOR-89-225/
Collision Regulations	https://laws-lois.justice.gc.ca/eng/regulations/c.r.c.,_c._1416/
Crew Accommodation Regulations	https://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1418/
Dangerous Bulk Materials Regulations	https://laws-lois.justice.gc.ca/eng/regulations/SOR-87-24/index.html
Dangerous Chemicals and Noxious Liquid Substances Regulations	https://laws-lois.justice.gc.ca/eng/regulations/sor-93-4/page-1.html
Department of Transport Act	https://laws-lois.justice.gc.ca/eng/acts/t-18/index.html
Fire and Boat Drills Regulations	https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2010-83/index.html
Fire Detection and Extinguishing Equipment Regulations	https://laws-lois.justice.gc.ca/eng/Regulations/C.R.C.,_c._1422/index.html
Fisheries Act	https://laws-lois.justice.gc.ca/eng/acts/f-14/
Garbage Pollution Prevention Regulations	https://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1424/index.html
Home-Trade, Inland and Minor Waters Voyages Regulations	https://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1430/
Hull Inspection Regulations	https://laws-lois.justice.gc.ca/eng/Regulations/C.R.C.,_c._1432/index.html
International Convention for the Control and Management of Ships' Ballast Water and Sediment	http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships'-Ballast-Water-and-Sediments-(BWM).aspx
International Convention for the Prevention of Pollution from Ships (MARPOL)	http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx

Federal and/or International Acts and Regulations	Reference
International Convention on Load Lines	http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-on-Load-Lines.aspx
International Maritime Dangerous Goods (IMDG) Code	http://www.imo.org/en/Publications/IMDGCode/Pages/Default.aspx
International Maritime Solid Bulk Cargoes (IMSBC) Code	http://www.imo.org/en/OurWork/Safety/Cargoes/CargoesInBulk/Pages/default.aspx
International Safety Management Code	http://www.tc.gc.ca/eng/marinesafety/dvro-4066.htm
Life Saving Equipment Regulations	https://laws-lois.justice.gc.ca/eng/Regulations/C.R.C., c. 1436/index.html
Marine Certification Regulations	https://laws-lois.justice.gc.ca/eng/regulations/SOR-97-391/index.html
Marine Liability Act	https://laws-lois.justice.gc.ca/eng/acts/M-0.7/
Marine Machinery Regulations	https://laws-lois.justice.gc.ca/eng/regulations/sor-90-264/
Marine Transportation Security Act	https://laws-lois.justice.gc.ca/eng/acts/m-0.8/
Marine Transportation Security Regulations	https://laws-lois.justice.gc.ca/eng/regulations/sor-2004-144/
Navigation Protection Act	https://laws-lois.justice.gc.ca/eng/acts/n-22/
Oceans Act	https://laws-lois.justice.gc.ca/eng/acts/o-2.4/
Oil Pollution Prevention Regulations	https://laws-lois.justice.gc.ca/eng/regulations/SOR-93-3/index.html
Response Organizations and Oil Handling Facilities	https://laws-lois.justice.gc.ca/eng/regulations/SOR-95-405/index.html
Safe Containers Convention Act	https://laws-lois.justice.gc.ca/eng/acts/S-1/
Safe Working Practices Regulations	https://laws-lois.justice.gc.ca/eng/Regulations/C.R.C., c. 1467/index.html
Safety Management Regulations	https://laws-lois.justice.gc.ca/eng/regulations/SOR-98-348/
Ship Station Radio Regulations	https://laws-lois.justice.gc.ca/eng/regulations/SOR-2000-260/
Shipping Casualties Reporting Regulations	https://laws-lois.justice.gc.ca/eng/Regulations/SOR-85-514/index.html
Shipping Inquiries and Investigations Rules	https://laws-lois.justice.gc.ca/eng/regulations/C.R.C., c. 1479/index.html
Ships' Elevator Regulations	https://laws-lois.justice.gc.ca/eng/regulations/C.R.C., c. 1482/
Standards for navigating Appliances and Equipment	http://www.tc.gc.ca/eng/marinesafety/tp-tp3668-menu-391.htm
Steering Appliances and Equipment Regulations	https://laws-lois.justice.gc.ca/eng/Regulations/SOR-83-810/index.html
Transportation of Dangerous Goods Program	http://www.tc.gc.ca/eng/tdg/safety-menu.htm
Vessel Traffic Services Zones Regulations	https://laws-lois.justice.gc.ca/eng/regulations/SOR-89-98/
VHF Radiotelephone Practices and Procedures Regulations	https://laws-lois.justice.gc.ca/eng/regulations/SOR-81-364/

Appendix B:
Baffinland Pre-Charter Bulk Carrier Ice Capability Assessment

B.1 Baffinland Pre-Charter Bulk Carrier Ice Capability Assessment

B.1.1 GENERAL

The Baffinland pre-charter bulk carrier ice capability assessment will be carried out prior to finalization of any charter.

B.1.2 APPLICATION OF THE VESSEL SELECTION PROTOCOL

The vessel selection protocol applies to vessels engaged in the export of iron ore according to the season during the planned period of the charter.

B.1.3 MINIMUM SPECIFICATIONS FOR VESSEL SELECTION

These are the minimum requirements for vessel selection according to the season during the planned period of the charter.

B.1.4 CRITERIA FOR DETERMINING VESSEL PERFORMANCE IN ICE

This is based on the Arctic Ice Regime Shipping System (AIRSS) calculation of ice numerals and Canadian Arctic Class or equivalent.

B.1.5 MINIMUM REQUIREMENTS FOR CARRIERS AND ALTERNATE IRON ORE CARRIERS

The minimum requirements will be specified in the Baffinland original request to brokers for proposals for vessels, taking account of the season and projected ice conditions during the period of the charter.

B.1.6 VESSEL ICE CAPABILITY ASSESSMENT

The main concern is to ensure that the carriers and alternate iron ore carriers selected are capable of operating in the ice conditions which are forecast for the period when the vessel will be operating in the approaches to Milne Inlet or within Milne Inlet.

The ice capability requirement is dependent on updated ice forecasting, based on current radar satellite information, related to the vessel's design, construction, ice performance, and operating procedures. The calculation is based on the following:

i. The ice numerals of a vessel being considered for operations into Milne Inlet ice, which will be calculated under the Arctic Ice Regime Shipping System (AIRSS).
ii. The vessel's Class and Type in accordance with Canadian Regulations (i.e., Canadian Arctic Class or equivalent).
iii. The thickness and character of the ice in Milne Inlet during the period of the charter.

B.1.7 ICE CONDITIONS FORECASTS AND ICE CAPABILITY ASSESSMENT

The following summary is provided as an aid to understanding Baffinland's vessel selection process for selecting vessels for operation into Milne Inlet.

1. An Ice Information Contractor, with expertise in ice measurement, forecasting and routing, will be contracted to provide a forecast of the ice conditions expected in the Milne Inlet area at the time of the proposed shipping.
2. The Owner and Managers of a vessel being considered for a charter shall be required to provide full details of the vessel's design, ice construction, machinery, class, etc. to the Baffinland Independent Contractor responsible for assessing the vessel's ice capability.
3. The Independent Contractor engaged by Baffinland shall consider the vessel's ice design and construction, ice performance and certificates to confirm if the vessel's ice numerals are positive and sufficient to enable the vessel to safely transit the forecast ice conditions in Milne Inlet during the projected time frame.

This contract shall be established well in advance of the first charter vessel assessment to enable the Independent Contractor to provide Baffinland with a list of information required to carry out their assessment of the proposed vessel's ice capability.

4. Providing the vessel meets all of the required criteria for navigating in the forecast ice conditions, the Independent Contractor shall determine that the vessel under consideration is structurally and mechanically capable of safely completing the contemplated voyage and will provide that determination to Baffinland.
5. Providing the vessel meets all of the above requirements for the charter, the vessel shall be subject to a general inspection to confirm that the vessel remains in good condition, meeting all of the equipment requirements and operating procedures necessary for vessels operating into Canadian ports. The Surveyor will also ensure that the equipment requirements and operating procedure requirements listed out in the Baffinland Inuit Impacts and Benefits Agreement (IIBA) are satisfied. These equipment requirements and operating procedure requirements are all included in the Baffinland pre-charter bulk carrier inspection checklist (refer to Appendix C).

The above inspection will be coupled with a limited audit to ensure that the vessel is operated in conformance with the International Safe Management regulations.

Providing that the vessel satisfies all of the above inspections and the limited audit, the vessel may be placed on charter.

Note: Surveyors conducting the pre-charter inspection will be informed of any special inspection requirements related to ice procedures and route planning not otherwise included in the Baffinland IIBA. The provision of a Berthing Master provides the necessary source of information and advice to a Master unfamiliar with the conditions in Milne Inlet.

6. Twenty-four hours before the chartered vessel enters the ice outside Milne Inlet, the Ice Information Contractor shall provide an updated estimate and forecast of the ice conditions which the vessel will encounter in and outside of Milne Inlet. The vessel's AIRSS ice numerals will again be calculated.

If the ice numerals remain positive for the updated ice report, the vessel may enter Milne Inlet.

If the ice numerals are negative, the vessel may not enter port until ice conditions improve and positive numeral results.

Appendix C:
Baffinland Pre-Charter Inspection Checklist and Limited Audit

C.1 BAFFINLAND PRE-CHARTER BULK CARRIER INSPECTION CHECKLIST AND LIMITED AUDIT

C1.1 INTRODUCTION

Baffinland Iron Mines Corp. has developed an Iron Ore mine at Mary River, Baffin Island, and shipping terminals at Steensby Port Site and Milne Inlet on Baffin Island in Nunavut.

In order to preserve the environment and the Inuit way of life, Baffinland have signed the Inuit Impacts and Benefits Agreement (IIBA) which, among other things, provides for the shipment of Iron Ore.

C.1.2 SHIPPING OPERATIONS

Carriers and alternate Iron Ore Carriers (should these be required) must be classed for ice navigation according to the expected ice conditions.

C.1.3 COMPLETION OF PRE-CHARTER BULK CARRIER INSPECTION AND LIMITED AUDIT

It is not the intention that the Baffinland inspector/surveyor inspect a bulk carrier and carry out a complete ISM Type audit in the course of the vessel's normal turn-around in port.

However, an experienced surveyor can examine the vessel's documentation or computerized safety and maintenance programs in sufficient depth to satisfy themselves as to the standard of operation and management of the vessel. This information coupled with a visual inspection of the hull and superstructure, machinery spaces, deck and safety equipment is normally sufficient for the Charter to decide whether the vessel is capable of working safely in Canada or otherwise. In order to save time we suggest that the surveyor uses a digital camera to photograph points of interest, general layout of the vessel, hull condition, etc., or any items which cause concern.

The following pre-charter bulk carrier inspection checklist is a combination of a Transport Canada Ship Safety Checklist, which is the standard required for all foreign ships entering Canada, to which we have added the requirements as identified by Baffinland as the outcome of the Environmental Assessment Process.

The limited audit outlined is sufficient to confirm that the vessel is maintaining ISM Standards.

PART 1 — PRE-CHARTER BULK CARRIER (INSPECTION AS PER THE FOLLOWING CHECKLISTS)

Section 1: General Information

Section 1: General Information		
1.1	Date this document completed	
1.2	Name of ship	
1.3	LR/IMO No.	
1.4	Date of name changes	
1.5	Flag	

1.6	Call sign	
1.7	INMARSAT number	
1.8	Ship's fax number	
1.9	Ship's telex number	
1.10	Ship's e-mail address	
1.11	Type of hull: (1) Single Hull, (2) Double Hull, (3) Double Bottom (4) Double Side, (5) Other (if Other, Specify)	
Section 1.2: Ownership and Operation		
1.12	Registered Owner	
1.13	Full Address Office telephone number	
1.14	Name of Operator (if different from above)	
1.15	Full Address	
	Office telephone number	
	Office fax number	
	Office email address	
	Contact person	
1.16	Contact person after hours telephone number	
	Emergency callout number	
	Emergency callout pager number	
	Contact details for person responsible for oil spill response.	
1.17	Total number of ships operated by this Operator	
Section 1.3: Builder		
1.18	Builder	
1.19	Date delivered	
1.20	If applicable, date of completion of major hull changes	
1.21	If major hull changes, what changes were made?	
Section 1.4: Classification		
1.22	Classification Society	LLOYDS REGISTER
1.23	Class Notation	
1.24	Date of last dry-dock	
1.25	Date next dry-dock due	
1.26	Date of last special survey	
1.27	Was last special survey an enhanced special survey?	
1.28	Date next special survey due	
1.29	If ship has Condition Assessment Programme (CAP) rating, what is the latest rating?	
1.30	Date of last annual survey	

1.31	Date of last boiler survey - port boiler	
1.32	Date of last boiler survey – starboard boiler	
1.33	If machinery on Continuous Survey are any item overdue or	
1.33.1	If Yes give details:	
1.34	Is ship subject to any conditions of class, class extensions, outstanding Memorandums or class recommendations?	
1.34.1	If Yes, give details:	

Section 1.4: Dimensions

1.35	Length overall (LOA)	
1.36	Length between perpendiculars (LBP)	
1.37	Extreme breadth	
1.38	Moulded breadth	
1.39	Moulded depth	
1.40	Does ship have a bulbous bow?	

Section 1.5: Tonnages

1.41	Net Registered Tonnage	
1.42	Gross Tonnages	
1.43	Moulded depth	

Section 1.6: Loadline Information

		Freeboard	Draft	Deadweight	Displacement
1.44	Summer				
1.45	Winter				
1.46	Lightship				
1.47	Normal Ballast Condition				
1.48	Segregated Ballast Condition				

Section 1.7: Recent Operational History

1.49	Has ship been involved in a pollution incident during the past 12 months?	
1.50	Has ship been involved in a grounding incident during the past 12 months?	
1.51	Has ship been involved in a collision during the past 12 months?	

Section 2: Certification and Documentation

	Certificates	Issue Date	Expiry	Last Annual
2.1	CERTIFICATE OF REGISTRY			
2.2	SAFETY EQUIPMENT CERT			
2.3	SAFETY RADIO CERTIFICATE			
2.4	SAFETY CONSTRUCTION CERTIFICATE			
2.5	LOAD LINE CERTIFICATE			
2.6	IOPP			
2.7	ISM			
2.8	INTERNATIONAL SEWAGE POLLUTION			

2.9	USCG (LETTER OF COMPLIANCE) CFR			
2.10	UNATTENDED MACHINERY SPACE CERTIFICATE			
2.11	INTERNATIONAL TONNAGE CERTIFICATE			
2.12	MINIMUM SAFE MANNING CERTIFICATE			
Documentation - Are the latest editions of the following publications t·ted on board?				
2.13	IMO *Safety of Life at Sea Convention (SOLAS 74)*			
2.14	IMO *International Code of Signals (SOLAS V-Reg 21)*			
2.15	IMO *international Convention for the Prevention of Pollution from Ships (MARPOI. 73/78)*			
2.16	IMO *Ships Routing*			
2.17	IMO *International Regulations for Preventing Collisions at* Sea *(COLREGS)*			
2.18	IMO *Standards of Training, Certification and* Watch *Keeping (STCW Convention)*			
2.19	Does the Vessel carry a SOLAS Safety Manual available to Crew?			
2.20	ICS *Guide to Helicopter/Ship Operations*			

Section 3: Crew Management

Date of Minimum Manning Certificate			
	Minimum Manning	Officers	Rating
3.1	Minimum manning required		
3.2	Actual required		
3.3	Nationality		
	Nationality		
	Nationality		
3.4	Common language used		

Section 4: Navigation Equipment

4.1	Is the vessel equipped With the following equipment?	Yes/No	Type	No Of Units
4.2	Standard Magnetic Compass			
4.3	Steering Magnetic or Periscope compass			
4.4	Gyro Compass			
4.5	Gyro Repeaters			
4.6	Radar 1 X Band (9 GHz)			
4.7	Radar 2 S Band (4 GHz)			
4.8	Are radars gyro stabilized?			
4.9	Radar plotting equipment			
4.10	ARPA			
4.11	Depth sounder with recorder			
4.12	Speed/distance indicator			
4.13	Doppler log			
4.14	Docking approach Doppler			
4.15	Rudder angle indicator			
4.16	RPM indicator			
4.17	Controllable pitch propeller indicator			
4.18	Bow thruster indicator			
4.19	Rate of turn indicator			
4.20	Radio direction finder			

4.21	Navtex receiver			
4.21	Satellite navigation receiver			
4.22	GPS			
4.23	Differential GPS			
4.24	ECDIS (Electronic Chart Display and Information System)			
4.25	EPIRB			
4.26	GMDSS Installation			
4.26	VHF Dual Installation			
4.28	VHF Portable hand Sets			
4.29	MFIHF Installation			
4.30	Inmarsat Installation			
4.31	Loran C receiver			
4.32	Course recorder			
4.33	Off — course alarm — gyro			
4.34	Off — course alarm — magnetic			
4.35	Engine order printer			
4.36	Anemometer			
4.37	Several pairs of binoculars			
4.38	Weather fax			
	Other Equipment			
4.40	Does vessel carry sextant(s)?			
4.41	Does vessel carry a signal lamp?			
4.42	Are steering and machinery controlled from the bridge?			
4.43	Are bridge controls available on bridge wings?			
4.44	Internal communications system?			
4.45	P.A. system?			
4.46	Sound signals, whistle, and fog horn?			
4.47	Navigation lights?			
4.48	Two powerful searchlights?			
4.49	Does the vessel have properly equipped pilot ladder clw manropes?			
4.50	Does the vessel have a substantial accommodation ladder either side?			
4.51	Does the vessel have a short light weight gangway with side ropes?			
4.52	Does the vessel have current navigational charts for the port and route?			

Section 5: Pollution Prevention

5.1	Is spill containment fitted under the cargo manifold?	
5.2	Is spill containment fitted under all bunker manifolds?	
5.3	Is containment fitted under the bunker tank vents?	
5.4	Is containment fitted around the deck machinery?	
5.5	Specify type of scupper plugs	
5.6	Are means provided for draining or removing oil from deck area/containment?	
5.7	Does the vessel have on board the equipment, procedures and resources for use in event of an oil spill?	
5.8	Does the vessel have a shipboard oil pollution emergency plan (SOPEP) that complies with the requirements of the MARPOL convention?	

5.9	Is the following pollution control equipment available to clean up oil spilled on deck?	
5.9.1	Sorbents?	
5.9.2	Non-sparking hand scoops/shovels?	
5.9.3	Containers?	
5.9.4	Emulsifiers?	
5.10	Does the vessel have a certified sewage system?	
5.11	Does the vessel have a sewage storage tank?	
5.12	Does the vessel have on board holding of bilge water?	
5.13	Does the vessel have on board holding of oily waste?	
5.14	Does the vessel have on board holding of solid wastes?	
5.15	is a garbage incinerator fitted?	

Part 2: LIMITED AUDIT OF THE OUTBOARD OPERATION OF THE ISM SYSTEM

International Safety Management Certificate	
Issued By Classification Society Name	
Last 5 year renewal	Date:
Intermediate audit	Date:
Internal audit	Date:
Name of Designated Person Ashore (DPA)	
Contact Phone Number Contact email address	

General	**Yes /No**
Are the ISM system manuals available to the crew?	
Are the Master, officers and crew familiar with the ISM system?	
Are crew familiar with the Ship's Contingency Plans & their responsibilities?	
Are crew familiar with safe working practices required onboard?	
Are crew wearing Personal Protective Equipment and Clothing as appropriate?	
Are safety signs exhibited throughout the vessel?	
Are ear defenders/plugs used in the machinery spaces?	
Are eye protectors available near burning and grinding gear?	
Is the Safety Officer named and familiar with his responsibilities?	
Are minutes of safety meetings kept and forwarded to Safety Officer/DPA?	
Are concerns raised at meetings dealt with effectively onboard?	
Are concerns beyond the ship's capacity attended to promptly by the ship's management?	
Is the secondary emergency control center maintained?	
Does the vessel have a Material Safety Data System (MSDS) in place?	
Accommodation	
Are the ship's accommodations clean, tidy and hygienic?	
Are lifejackets and survival suits stored in each cabin?	
Are fire extinguishers, alarms, etc. in place and in date?	
Are public rooms, mess rooms etc. clean, tidy and hygienic?	
Are the galley and food stores clean with refrigerators operational?	
Is proper food handling and food hygiene in effect?	
General Exterior Inspection	
Is the ship's hull in good external condition & well coated?	
Is the visible lower hull free from fouling?	
Is an organotin, tributalin or biocide based anti-fouling coating used?	

Machinery Spaces						
Machinery Space						
Main Engines						
Generators						
Boilers						
Inert Gas System			Nitrogen		CO_2	Yes
General Cleanliness	Good					
Bilge Cleanliness	Good					
Oily Water Separator						
Oil Sludge Tank			Capacity	21.7 m3		
Ballast Pumps			Capacity	cu. metres/Hr		
Sewage Pumps	Type					
Sewage Holding Tank	Capacity		m^3		Days	

Engine Rooms Records	
Engine Room Log Book (Note engine/generator/bolier breakdowns in port or shut downs at sea during the last two voyages)	
Fuel consumption per day	Mt/Day
Lube oil consumption	Ltrs/Day
Planned Maintenance System (Note if up to date and any outstanding work)	
Oil record book (Must be up to date and signed by C/E and Master)	

Deck Log Book – For Last Voyages	
Average Speed	kts
Weather	
Are charts and publications corrected up to date?	
Has the Master been provided with a Port Information Book?	
Is the Master aware that he must carry all the necessary Canadian charts and publications before arrival in Canada?	
Are ballast transfer/changes recorded in a ballast log book records (Last Voyage)?	

Life Saving Appliances						
Lifeboats	Total No		Open/Enclosed			
	Type		Motor		Enclosed	
Davits	Type					
No. of Survivors	Capacity					
Rescue Boat	Condition					
Davits						
Life Rafts	Date		Capacity:			
Life Raft Davits for above						
Survival/Immersion Suits	Total					
SARTS						
Records of Lifeboat Drills, Fire Drills, etc.						
Are post exercise debriefings held after each exercise and are all crew invited to comment as to how to improve the effectiveness of the fire team, first aid teams, etc.?						

CREW CERTIFICATION

Requirements:

All crew to have Certificate of Training in Emergency Duties and Fire Fighting issued by an accredited institution. The Master, 1St Mate and two Senior Engineers shall be certified for all Emergency Command and Control Issues. At least two Officers shall be qualified GMDSS operators.

All new crew shall be provided with an orientation of the ship on joining. This will include an introduction to his duties, the emergency signals and his emergency station under the various contingencies.

A booklet setting out details of the vessel should be provided in each cabin along with notices showing how to don a lifejacket and or survival/immersion suit.

Every vessel shall have a SOLAS manual onboard available to all crew members. This manual describes in the common language(s) of the crew, each piece of safety equipment, its position onboard and how to operate it.

Check make up and qualifications of all watch-keeping Officers and Engineers.

Can the vessel operate with the machinery spaces unmanned (UMS)? If so, the machinery space must be manned by at least one watch-keeping engineer when the vessel is reduced to manoeuvring speed for entering or leaving port.

Qualification of Master and Watch Keepers

Crew First Aid Training: Numbers:

Advanced First Aid Training: Numbers:

Rescue Craft Training: Numbers:

Crew	Certificate of Competency			Basic Safety Certificate		Adv. Safety Certificate	
	Level	State	Date	State	Date	State	Date
Master							
1st Mate							
2nd Mate							
3rd Mate							
Chief Eng.							
1st Eng.							
2nd Eng.							
3rd Eng.							
4th Eng.							
Seamen							

Other Information	Yes/No	Comments
The suitability of the winterization of the vessel's onboard systems and equipment, including deck and cargo equipment, evacuation craft, etc. for operation in cold temperatures and icing according to all expected conditions.		
The provision of clear vision systems for unimpaired forward and astern vision in cold temperatures, icing, etc		
The suitable of the vessel's navigation equipment and appliances for safe navigation through ice in all expected conditions.		
The suitable of key safety-related and survival equipment for cold temperatures, ice and icing conditions – including survival kits and immersion suits.		
Confirmation that the vessel's officers and crew are familiar with cold weather survival procedures and the environmental conditions which they can expect to encounter.		
Confirm that the vessel's ice navigation history has established that the vessel has a record of successful navigation in ice conditions comparable to those expected in Anaktalak Bay during the voyage.		
Confirm that the vessel's operating manuals include a clear statement of the operating limitations for the vessel and its essential systems in all anticipated ice conditions, temperatures and other environmental conditions.		
Confirm that the vessel's operating manuals include passage planning procedures accounting for anticipated ice and other environmental conditions and transit speeds having due regard to the vessel's class and type in the anticipated conditions.		
Confirm that the vessel's operating manuals include deviations from standard operating procedures when navigating in ice-covered waters, including the operation of machinery systems, remote control and warning systems, electric and electronic systems.		
Confirm that the vessel has appropriate escape and evacuation procedures into cold water and ice, etc		
Confirm that the vessel is adequately equipped and its crews are properly trained to provide effective damage control and minor hull repair under all expected conditions.		

Appendix D:
2021 Narwhal Adaptive Management Response Plan

Baffinland Iron Mines Corporation

Mary River Project

2021 NARWHAL ADAPTIVE MANAGEMENT RESPONSE PLAN

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ATTACHMENTS

1 INTRODUCTION

Baffinland Iron Mines Corporation (Baffinland) has prepared this 2021 Narwhal Adaptive Management Response Plan (the Plan) for the purpose of sharing information with interested Parties on Baffinland's interim mitigation measures for the 2021 shipping season and its marine mammal monitoring programs. The contents of this Plan have been informed by discussions and consultations with Inuit, notably representatives of the Hamlet of Pond Inlet and the Mittimatalik Hunter and Trappers Organization (MHTO), Fisheries and Oceans Canada and the Marine Environmental Working Group (MEWG).

2 BACKGROUND

On April 8 2021, Baffinland provided to the NIRB a Technical Memo prepared by Baffinland's marine mammal monitoring technical consultants, Golder Associates Ltd. (Golder), entitled Preliminary Summary of 2020 Narwhal Monitoring Programs (the Memo) (Doc ID: 334991). The Memo outlined key results of Baffinland's 2020 marine mammal monitoring programs, notably that through the 2020 marine mammal aerial survey, Golder had recorded a statistically significant decline in the stock estimate for the Eclipse Sound summer narwhal stock. The Memo also included a preliminary investigation of several factors that may have contributed to the recorded decline in the stock estimate, including icebreaking activities associated with Baffinland's 2020 shipping season.

Given the inability to determine the primary cause of the decline in the stock estimate, Baffinland committed to following up with the NIRB and interested Parties on these results. Actions committed to included: seeking feedback on the Memo, engaging with Parties and requesting input on the proposed additional mitigations Baffinland would implement during the 2021 shipping season, providing copies of the program-specific technical monitoring reports that substantiated the preliminary summary of results presented in the Memo, as feasible, completing additional investigations into potential causal factors, and providing an Adaptive Management Response Plan.

3 SUMMARY OF ENGAGEMENT AND OUTCOMES

3.1 ENGAGEMENT ACTIVITIES

Subsequent to Baffinland's April 8, 2021 submission, the NIRB facilitated a comment and response period for interested Parties on the Memo. On or before May 17, 2021, the NIRB received comments from:

1. Qikiqtani Inuit Association (QIA; Doc ID: 335352);
2. Hamlet of Pond Inlet (Doc ID: 335355 & 335356);
3. Ikajutit Hunters and Trappers Organization (IHTO; Doc ID: 335354);
4. Government of Canada;
   a. Department of Fisheries and Oceans Canada (DFO; Doc ID: 335350)
   b. Parks Canada (PC; Doc ID: 335353)
5. Oceans North (ON; Doc ID: 335351).

On June 4, Baffinland provided responses to comments from these Parties (Doc ID: 335788).

In addition to NIRBs facilitated exchange of written comments on the Memo, Baffinland conducted its own engagements with several Parties. A summary of these engagements have been captured in Attachment A. Details of these engagement activities will also be captured in Baffinland's 2021 Annual Report to the NIRB.

3.2 KEY OUTCOMES

Through these consultation efforts, to-date Baffinland has received at a high level, the following feedback.

Table 1: Summary Of Engagement Outcomes

Summary of Comment/Recommendation	Baffinland Response / Outcomes
Recommendations from Hamlet of Pond Inlet, Parks Canada, DFO and QIA on enhancements to Baffinland's existing and proposed monitoring programs.	Baffinland has committed to working with these Parties further on the refinement of these programs (i.e. analysis of EWI monitoring at Bruce Head). Baffinland also reaffirmed the need for and importance of strengthened regional monitoring that will enhance Baffinland's ability to discriminate Project-related effects from other anthropogenic activities or environmental changes that could be affecting the Eclipse Sound summer narwhal stock.
DFO and QIA identified the need for additional details on the methodology and analysis undertaken for each of Baffinland's 2020 marine mammal monitoring program in order to provide more fulsome feedback.	Baffinland distributed copies of all of its draft 2020 marine monitoring programs to the MEWG on May 13, 2021. Comments were submitted by MEWG members on July 8, 2021. Responses to all comments received will be provided as an appendix to the final versions of these monitoring reports, which will incorporate comments from the MEWG as relevant.
Hamlet of Pond Inlet and QIA requested additional information on pile driving activities associated with the SCH construction and icebreaking activities, respectively.	Baffinland noted that requests for additional information on SCH activities were directed to the GN and DFO. Baffinland has submitted information requests to these Parties that would assist in answering in some of the Hamlet's inquiries, however no information has been provided by these Parties to-date. In response to the QIA, Baffinland provided an appendix to its June 4 2021 responses to comments that breaks down the distance travelled by vessels in various ice

Summary of Comment/Recommendation	Baffinland Response / Outcomes
	concentrations along the shipping route in 2017, 2018, 2019 and 2020.
QIA and DFO sought additional information regarding how Baffinland had accounted for the SCH in its cumulative effects assessment.	Baffinland provided clarity to these Parties on its responsibilities with respect to cumulative effects assessment and monitoring. Baffinland also requested DFO formally describe what its mandated responsibilities are for cumulative effects monitoring on a regional scale with respect to managing cumulative effects on marine mammals in Canadian Arctic waters and provide its proposed strategy for cumulative effects assessment in this regard, and describe what level of cumulative effects monitoring has been completed by the Government of Canada to date in support of this work.
Recommendations from MHTO and Hamlet of Pond Inlet to eliminate icebreaking activities from Baffinland's operational activities.	Baffinland proposes to avoid icebreaking at the beginning of the 2021 shipping season. The trigger to begin shipping will be a continuous path of 3/10ths ice concentrations between Baffin Bay and Milne Port. The icebreaker will still be present throughout the season, however, it will only serve as a precaution at the beginning of the shipping season. Icebreaking may still be required at the end of the shipping season, depending on ice conditions. However, Baffinland will continue to close the shipping season to avoid breaking landfast ice.

4 DESKTOP INVESTIGATION

Since the submission of the Memo, Baffinland has conducted additional analyses of two of the anthropogenic factors (icebreaking and construction noise from the small craft harbour) that were identified as potential causal activities for the reported decline in the stock during 2020 monitoring. Baffinland also remains committed to additional work on the two natural factors identified in the Memo (regional sea ice conditions and increased killer whale presence).

4.1 REGIONAL SEA ICE CONDITION

Procurement of detailed remote sensing imagery will provide a more accurate representation of sea ice conditions on an annual scale that can be compared to annual shipping and icebreaking activities. The following information will provide a greater understanding of how narwhal distribution is affected by differences in sea ice conditions:

- Total ice cover of ice field (km2) in Eclipse Sound from time landfast ice is gone to <3/10 ice concentration
- Temporal persistence of ice leads
- Range in size of ice floes (max diameter and area (km2))

This information will provide a more accurate representation in terms of how long sea ice persists in Eclipse Sound during ice break-up and may be used to refine the proposed mitigation measures related to seasonal ice concentrations. This information and subsequent analysis will be included in Baffinland's 2021 reporting.

4.2 ICEBREAKING

As part of Baffinland's responses to comments on June 4, Baffinland provided additional information on the distance (expressed in nautical miles) travelled by Baffinland's chartered vessels along the shipping route across multiple shipping seasons. This information is supplemental to what was presented in the Memo, which described the time (number of hours) that Baffinland vessels travelled through different ice regimes. As shown in Figure 1, vessels travelled approximately 110nm through 9/10 ice concentrations in the 2020 season, compared to approximately 43nm in 9/10 ice concentration in the 2019 season.

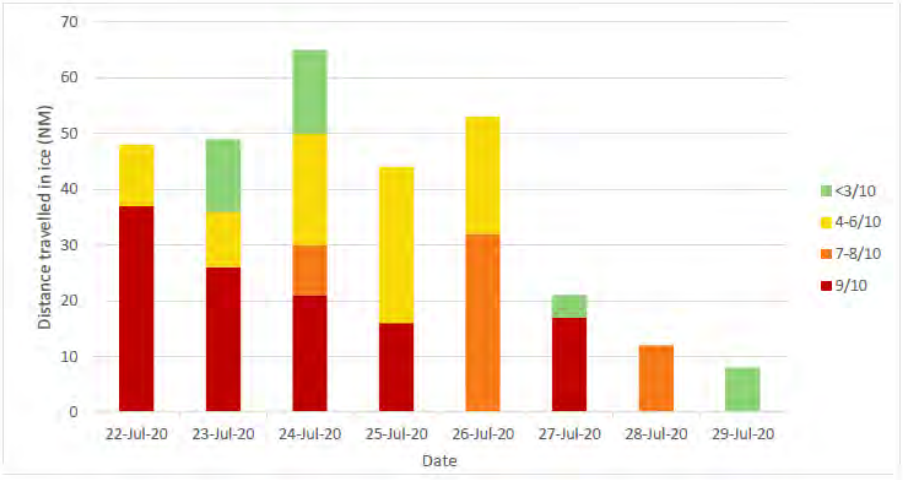


Figure 1: Distance (Nm) Travelled By Vessels In Various Ice Concentrations Along The Established Shipping Route, Withing The RSA, In 2020

It is being considered that decreasing ice concentrations serve to minimize conflicts with narwhal that could potentially be staging in ice leads, given that as ice concentrations decrease, more leads will be present, which allows

for multiple 'options' for vessels and narwhal to travel southwest along the shipping route with lower rates of interaction. Baffinland can use ice imagery as well as aerial surveys combined with information provided by the community of Pond Inlet to continue to monitor narwhal movements in the earlier part of the shipping season.

4.3 CONSTRUCTION NOISE FROM SMALL CRAFT HARBOUR

Baffinland is awaiting information from the Government of Nunavut to support this analysis. Once received, updated information will be provided in a Technical Memorandum that will be posted to the NIRB Registry.

4.4 INCREASED KILLER WHALE PRESENCE

It is Baffinland's understanding that DFO currently implements a community-based killer whale sightings program in both Arctic Bay and Pond Inlet that Baffinland hopes to build upon for addressing this critical data gap in the RSA. Underwater acoustic data collected from the Bruce Head, Bylot Island and Ragged Island recorders in 2020 will be used to identify seasonal occurrence and location of killer whales in the RSA to supplement the available 2020 sightings record (combined DFO/community and Baffinland sightings). This will help identify the earliest arrival of killer whales in the RSA for comparative purposes to previous years, to inform how killer whales may have influenced narwhal space use patterns at the time of the 2020 aerial surveys.

5 FOLLOW-UP MONITORING

5.1 PROJECT MONITORING PROGRAM OVERVIEW 2021

5.1.1 PROJECT SPECIFIC MONITORING PROGRAMS

As was outlined in the Memo, Baffinland has several marine mammal monitoring programs designed to assess the effects of Project shipping activities on marine mammals. In 2021, Baffinland will implement the following marine mammal monitoring programs that will further our understanding of project related and cumulative effects to narwhal in the Regional Study Area:

Table 2: Summary Of 2021 Narwhal Monitoring Programs

Program	Basic Description	2021 Follow-up Monitoring Priorities/ Considerations
Bruce Head Shore-Based Monitoring Program (Visual)	Visual Observations: • Relative Abundance and Distribution (RAD) • Group Composition and Behaviour • Human Activity o Vessel Traffic o Hunting • Weather and Anecdotal Observations *Project-related vessels tracked via both satellite and shore-based AIS Estimated Start Date: July 30th Estimated Duration: 4 weeks	• Monitor for local change in relative abundance and animal distribution including interannual variation • Monitor behavioural responses to shipping and other stressors (hunting, predation) • Monitor Early Warning Indicator (EWI): change in the proportion of immature narwhal between years – was calving or calf survival potentially affected in 2020
Bruce Head Shore-Based Monitoring Program (UAV)	UAV Observations: • Focal Follows – Northern Shipping Route, Koluktoo Bay • Systematic Survey – Stratified Study Area (SSA) • Morphometrics – Body Condition *Proposed system by InDro Robotics: DJI M300 Estimated Start Date: July 30th Estimated Duration: 4 weeks	• Monitor narwhal behaviour in the presence and absence of vessels – do individual narwhal or narwhal pods modify their behaviour in the presence/absence of vessels in the open-water shipping season (multiple response variables examined) • Does the distance at which individual narwhal or narwhal groups react to vessels differ from past years, irrespective of the overall abundance of narwhal in the RSA? do narwhal react to vessels in similar manner to previous years? • Monitor narwhal body condition (beginning in 2021). The photogrammetric data collection of narwhal (morphometric baseline data) using UAV will be sued to monitor for

Program	Basic Description	2021 Follow-up Monitoring Priorities/ Considerations
		potential interannual and seasonal changes in narwhal body condition (variable length/width measurements along body) that would indicate food/foraging success and/or stress response.
Marine Mammal Aerial Survey Program (Leg 1)	• Open-water and floe edge area east of Pond Inlet; Pond Inlet and Baffin Bay strata • Line-transect surveys – data recorded by onboard MMOs • Transition to photographic surveys when large animal aggregations encountered (same as 2019-2020 survey design) Estimated Start Date: July 18th; Estimated Duration: 19 days	• Monitor narwhal relative abundance and distribution in the Regional Study Area (RSA) prior to and during the early part of the season. Allows comparison to previous year(s) (interannual variation). Collect simultaneous data on sea ice conditions and killer whale data which allows for these factors to be considered in the analysis. • The 2021 Leg 1 aerial surveys have been extended by 1 week (now 3 weeks total) and will merge directly into the Leg 2 aerial surveys (separate 3-week survey). Will allow for abundance estimates in the RSA throughout the season from the start of shipping operations. • Narwhal sightings data will be used to inform shipping schedule and shipping routing such to avoid concentrations of narwhal in ice leads (if present)
Marine Mammal Aerial Survey Program (Leg 2)	• Same strata as 2016 DFO photographic aerial survey and 2019-2020 BIM aerial survey • Line-transect surveys – data recorded by onboard MMOs • Transition to photographic surveys when large animal aggregations encountered (same as 2019-2020 survey design) Estimated Start Date: August 6th Estimated Duration: 19 days	• Updated abundance estimate for the Eclipse Sound and Admiralty Inlet narwhal summer stocks – compare abundance estimates to previous years. • Extend Leg 2 to by 1 week to 3 weeks total in 2021 to cover a great spatial extent and track potential changes in narwhal distribution and abundance during shipping operations (now merges directly with Leg 1 aerial survey).
Marine Mammal Aerial Survey Program (Leg 3)	• 2-3 days of narwhal clearance flights in Regional Study Area (RSA) at end of shipping season	• Visual clearance survey to confirm that no narwhal entrapment events have occurred in the RSA following

Program	Basic Description	2021 Follow-up Monitoring Priorities/ Considerations
	• Line-transect surveys – data recorded by onboard MMOs • Transition to photographic surveys when large animal aggregations encountered (same as 2019-2020 survey design) Estimated Start Date: End of Shipping Season Estimated Duration: 2 days	completion of Baffinland's 2021 shipping operations along the Northern Shipping Route.
Passive Acoustic Monitoring Program	Early August: deployment of 3 recorders • Bruce Head • Ragged Island anchorage • Pond Inlet (Small Craft Harbour Construction) September • Retrieval of 3 recorders deployed in August • Re-deployment of 2 recorders at the floe edge o Record late shoulder season transits in 2021 o Sleep overwinter o Start recording in early July 2022: Record narwhal at floe edge and early should season transits Estimated Start Date: Early August Estimated Duration: 2020 open water and Fall shoulder season; 2022 Spring shoulder season	• Measure and characterize ambient noise levels along the Northern Shipping Route – compare the data to previous years. • Acoustically monitor for narwhal and killer whale presence along the shipping corridor – document spatial and temporal variability in the RSA. • Evaluate underwater noise levels from Project shipping and icebreaking noise levels in relation to established marine mammal underwater acoustic thresholds for injury and onset of disturbance. • Estimate the extent of listening range reduction (LRR) associated with vessel transits along the Northern Shipping Route relative to ambient noise conditions. • Compare measured sound levels of shipping/icebreaking to estimated (modelled) sound levels. • Evaluate vessel noise signatures and potential changes in narwhal vocal behaviour in relation to shipping. • Measure pile driving and other construction sound levels near the Small Craft Harbour Construction site in August 2021.
2022 Narwhal Tagging Program (Planning in 2021)	• Deployment of high-resolution location (satellite) tags and dive loggers on narwhal in ice leads in Eclipse Sound during early July 2022.	• Will provide detailed 3-dimensonal movements of narwhal in relation to ice conditions and vessel movements in RSA. Studying narwhal behavioural

Program	Basic Description	2021 Follow-up Monitoring Priorities/ Considerations
	• No tagging of narwhal will occur near floe edge (no interference with Inuit hunting activities) • No live capture involved. Remote deployment of tags. Tags will fall off animal after several weeks. Estimated Start Date: July 05 2022 Estimated Duration: 14 days	responses to shipping/icebreaking – includes 12 response variables (e.g. surface time, bottom time, dive velocity, travel speed, travel orientation, etc).

Each monitoring program has its own objectives and scope, which includes studying potential effects of shipping on marine mammal density, abundance or distribution in the RSA, fine-scale behavioural responses of marine mammals to vessel presence, and duration and scale of noise generated by Project vessels relative to marine mammal thresholds for injury and noise disturbance. These programs provide relevant information independently as well as providing complementary information to provide a holistic approach to studying the Regional Study Area. All programs can benefit from additional information including community knowledge and other initiatives led by government or other parties if and when shared with Baffinland.

Detailed information on Baffinland's 2021 marine monitoring programs were presented to representatives from the Hamlet of Pond Inlet and the MHTO on May 28, 2021 and to the MEWG for feedback on June 29, 2021.

5.1.2 CUMULATIVE EFFECTS MONITORING

Baffinland's responsibility with respect to cumulative effects monitoring for the Project is prescribed in Project Certificate conditions 110, 111 and 112. These terms and conditions require Baffinland to study the cumulative effects of vessel noise. Under Section 7.8 of the EIS Guidelines, a cumulative impact (or effect) is defined as the impact on the environment that results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions. The scope of Baffinland's cumulative effects monitoring is therefore focused on studying the additive effects of anthropogenic activities on marine mammal populations, which is adequately addressed by Baffinland's ongoing monitoring programs and those planned for future years (i.e. a 2022 narwhal tagging study).

5.1.3 ECLIPSE SOUND NARWHAL STOCK ASSESSMENT

The Government of Canada, through the Oceans Act (1997) is committed to the integrated management of human activities in or affecting Canada's marine ecosystems. Eclipse Sound narwhal are specifically subject to the Integrated fisheries management plan for narwhal in the Nunavut Settlement Area. This integrated plan identifies that DFO maintains an active scientific research program, aimed at an increased understanding of narwhal population processes (e.g. seasonal distribution, movements and diving behaviour, habitat use, diet analysis), environmental factors that influence narwhal distribution and numbers, and the role of narwhal in marine ecosystems. Specific research and information needs have been identified to improve narwhal stock assessments, and include:

- conduct aerial surveys to estimate abundance for the Northern Hudson Bay and Baffin Bay management units to develop the time series necessary for risk analysis of various harvest scenarios
- assess other methods of estimating narwhal stock abundance (e.g mark/recapture)

- gather TEK regarding Parry Channel/Jones Sound/Smith Sound narwhal
- use telemetry data to develop robust methods required to adjust counts for animals under water
- gather biological samples from harvests in as many communities as possible to assess stock status.
- conduct fishery independent monitoring to determine loss rates

Baffinland will engage with the Department of Fisheries and Oceans and Parks Canada through the Marine Environment Working Group (MEWG) prior to and during the 2021 shipping season to determine what federal led or supported monitoring programs are planned to improve the collective understanding of the Eclipse Sound summer narwhal stock, consistent with the Integrated fisheries management plan for narwhal in the Nunavut Settlement Area.

5.1.4 COMMUNITY BASED MONITORING PROGRAMS

Baffinland has established the Wildlife Monitoring Program through the Mary River Inuit Impact Benefit Agreement. This Program is specific to the research interests of the community of Pond Inlet and makes up to $200,000 available on an annual basis to support eligible proposals. Results and data summaries generated through the Program may be used by Baffinland and/or QIA to support other Mary River project monitoring and mitigation plans.

Prior to implementing any programs in a given year, the community of Pond Inlet is responsible for developing an annual work plan, which is then presented to the Joint Executive Committee (Baffinland and QIA) for review and approval. To date the JEC has not received any project plans, however, Baffinland plans to engage directly with the Hamlet of Pond Inlet and the MHTO to discuss their intentions towards the Wildlife Monitoring Program for 2021, and if there are any opportunities for community led programming to support Baffinland's follow-up monitoring initiatives.

5.2 PROJECT MITIGATION AND ADDITIONAL ADAPTIVE MANAGEMENT MEASURES FOR 2021

5.2.1 BAFFINLAND APPROACH TO ADAPTIVE MANAGEMENT

Recognizing the value of the Eclipse Sound summer narwhal stock to the residents of Pond Inlet, and that there are unknown and/or unmitigated cumulative activities occurring in the Marine RSA that are likely to continue in 2021, Baffinland is committed to taking a precautionary approach and adding additional mitigations to its shipping activities in 2021 on an interim basis.

5.2.2 ENHANCED SHIPPING MITIGATIONS

Baffinland has elected to implement an additional mitigation measure during the 2021 shipping season as a precaution. Baffinland has committed that the 2021 shipping season will not commence until a continuous path of 3/10ths or less ice concentration is available along the Northern Shipping Route. Based on historical ice conditions, this additional mitigation could delay the start of shipping between 2 and 3 weeks from when landfast ice has broken along the Northern Shipping Route, and is more conservative than all 5 options recommended by Golder in the Preliminary Summary of 2020 Narwhal Monitoring Programs (the Memo), including Option 5, which is based on a recommendation by the Hamlet of Pond Inlet.

The additional mitigation measure will serve to delay the commencement of the shipping season, eliminate icebreaking activities, and shorten the overall number of shipping days available to Baffinland in the 2021 season. The scale of the delay in the shipping season and reduction in shipping days will not be known with certainty until operations commence.

Baffinland will continue to implement all other existing mitigation measures as described in Section 6 of the Shipping and Marine Wildlife Management Plan (2021).

5.3 ROLES AND RESPONSIBILITIES

The roles and responsibilities of Baffinland Shipping Team and Contractors will be consistent with those outlined in Section 2 'Roles and Responsibilities' of the Shipping and Marine Wildlife Management Plan (2021).

5.4 REPORTING

All marine and Project operations monitoring activities and reports will be issued in accordance with Section 7 of the Shipping and Marine Wildlife Management Plan (2021).

ATTACHMENT A

SUMMARY OF ENGAGEMENT

1. Meeting with DFO on April 9 2021 to provide an overview of information contained within the Memo.
2. Sent an information request to DFO on April 22 2021 to obtain additional information on the 2020 Small Craft Harbour (SCH) construction activities for the purpose of conducting additional investigations into potential causal factors.
3. Provided the Marine Environmental Working Group (MEWG) copies of all its 2020 Draft Marine Monitoring Program Reports on May 13, 2021, with comments expected back from the MEWG on June 24, 2021.
4. Submitted to the Nunavut Impact Review Board (NIRB) its 2020 Annual Monitoring Report as of May 6, 2021, with comments expected back from interested Parties on July 6, 2021.
5. Held a meeting with the MEWG on May 13, 2021 to provide an opportunity for members to ask questions regarding the Technical Memo in advance of their written submissions. A copy of the draft minutes from the May 13 2021 MEWG Meeting and the relevant presentation materials were provided to the NIRB as part of Baffinland's June 4 2021 submission (Doc ID: 335788).
6. Met with representatives from the Mittimatalik Hunter and Trappers Organization (MHTO) and the Hamlet of Pond Inlet to discuss plans for the 2021 shipping season on May 28, 2021,
7. Hosted a radio show in Pond Inlet with a question and answer period on June 2, 2021.
8. Met with representatives from DFO on June 22, 2021 to provide an opportunity for follow-up questions on Baffinland's responses to comments submitted by DFO on the Memo and to discuss the Draft version of the 2021 Narwhal Adaptive Management Response Plan.
9. Held a meeting with the MEWG on June 29, 2021 where details regarding Baffinland's 2021 monitoring programs and an overview of shipping season were provided.
10. Met with representatives from the Hamlet of Pond Inlet on June 30, 2021 and July 12, 2021 to discuss Baffinland's Draft version of the 2021 Narwhal Adaptive Management Response Plan
11. Sent an information request to the Government of Nunavut on July 7, 2021, with follow-up on July 12, 2021 to obtain additional information on the 2020 Small Craft Harbour (SCH) construction activities for the purpose of conducting additional investigations into potential causal factors.

Baffinland also requested additional meetings with the QIA and MHTO to discuss the Memo, however, neither Party responded with an intention to meet.

Appendix 2

2021 Shipping and Marine Monitoring Fact Sheet

Baffinland

SHIPPING AND MARINE MONITORING FACT SHEET

2021 Shipping Season

BAFFINLAND SHIPPING

Contents

BAFFINLAND SHIPPING ACTIVITIES

In 2021, Baffinland Iron Mines Corporation ("Baffinland or the 'Company') will begin its shipping activities once certain requirements have been met including no presence of landfast ice along the entire Northern Shipping Route, confirmation that the Pond Inlet floe edge has been closed, and that icebreaking will not be required for vessels transiting towards Milne Port.

Baffinland has elected to strengthen the mitigation measures for the 2021 shipping season in direct response to Inuit input and the recognition of an important community-based project occurring (i.e., construction of the small craft harbour) which overlaps with the planned start of the Baffinland shipping season. In an effort to reduce potential cumulative impacts of the Project to narwhal during this sensitive time period, Baffinland aims to further reduce potential impacts by electing to delay the start of the shipping season until icebreaking is no longer required for vessels transiting towards Milne Port.

With this decision, the trigger to commence the beginning of the 2021 shipping season will be the presence of a continuous path of 3/10ths or less ice concentrations between the entrance of Eclipse Sound and Milne Port.

The final shipping schedule will depend on prevailing ice conditions and once initiated will continue until approximately mid-to-late October. Within this timeframe, we expect there to be approximately 72-76 ore carriers, four (4) re-supply voyages and up to four (4) fuel tanker voyages. As the season progresses, we will keep you updated on any new changes.

What you've shared with us

Through valuable conversations with local community members, Baffinland has heard a number of primary concerns related to shipping through the Northern Shipping Route.

The potential for shipping to interfere with local hunting

The potential for vessels to affect marine mammals

The potential for shipping activity to harm the health of the marine ecosystem

ADDRESSING CONCERNS

How has Baffinland addressed these concerns?

Baffinland is committed to continuing to monitor any potential effects of shipping activities. Here are some of the measures we will be implementing to manage and mitigate potential issues:

1. Baffinland vessels will not break through landfast ice and will wait for confirmation that the floe edge has been closed before entering Eclipse Sound. In 2021, the shipping season will only start once it is confirmed that there is a continuous path of 3/10ths or less ice concentrations between the entrance of Eclipse Sound and Milne Port.
2. Vessels are to travel as closely as possible to the approved Northern Shipping Route, but may deviate at the beginning of the season for the putposes of avoiding ice. We have a notification system that alerts Baffinland staff if any Baffinland vessels are travelling above the speed limit (maximum of 9 knots) or outside of the approved Northern Shipping Route. An Automatic Identification System (AIS) station is available at the Baffinland office in Pond Inlet.
3. We have provided additional instructions to ship operators indicating that a maximum of three vessels can be anchored or drifting at Ragged Island at any one time.
4. Ensure that all Baffinland vessels follow the Standing Instructions to Masters which provides information to vessel captains on speed limits, the shipping route, and anchorage locations.
5. No grey water, sewage or ballast water will be discharged in Eclipse Sound by ore carriers. Ballast water is only discharged by ore carriers at Milne Port after compliance testing.
6. Baffinland will continue to work with community members, Hunters and Trappers Organizations and Hamlets to ensure that all concerns related to shipping activities are considered. Full-time Shipping Monitors will be available in the Baffinland Pond Inlet office to support daily tracking and viewing of vessels passing through Eclipse Sound all the way to Milne Port.

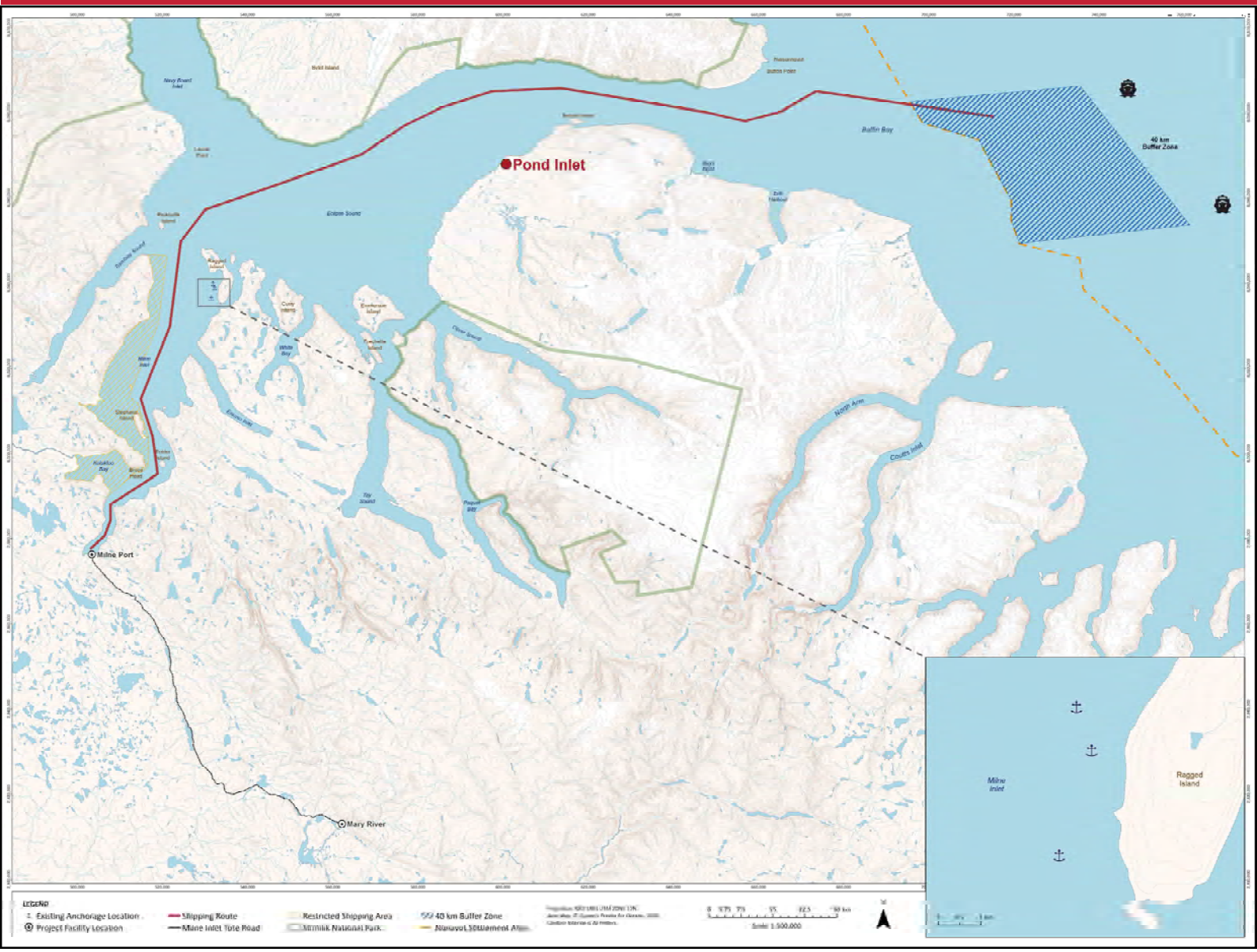
To date, no significant changes have occurred to the marine environment at Milne Port as determined through marine environmental effects monitoring programs implemented since start of operations.

However, a reduction in narwhal numbers in 2020 relative to historical estimates (pre-2020) based on analysis of 2020 aerial survey data has been reported, consistent with concerns raised by the community.

In response, a precautionary approach is being taken where new adaptive management mitigation measures have been developed specific to 2021 shipping operations: the avoidance of icebreaking at the start of the shipping season.

It is important to remember that the health and safety of people is always Baffinland's top priority. In some situations, the vessel captains may need to deviate away from standard operating procedures to ensure safe passage.

SHIPPING ROUTE



HAVE QUESTIONS OR CONCERNS?

If you are on the water and have an immediate concern, **contact our shipping monitor via VHF radio channel 26.**

Visit the Baffinland office and speak with our shipping monitor or **view vessel tracks** in the Mittimatalik Hunters and Trappers Organization (MHTO) building, 2nd floor.

*****Due to the COVID-19 Pandemic the Baffinland Office may be closed in accordance with Public Health Measures. Please phone ahead before visiting*****

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Email us at :
shipping@baffinland.com

Call us at:
899-1807

For shipping updates visit:
www.baffinland.com
> Operation
> Shipping & Monitoring

POTENTIAL EFFECTS ON THE ENVIRONMENT

Shipping may affect marine mammals:

- Distribution and abundance
- Behaviour
- Habitat

Shipping could potentially affect the local marine environment by:

- Introducing aquatic invasive species
- Altering the quality or quantity of fish habitat
- Altering water quality near Milne Port

Killer Whales Observed in Milne Inlet (August 2020)

MARINE MONITORING PROGRAMS

What are we doing to monitor the marine environment?

To monitor potential effects from shipping on the marine environment, Baffinland will be running a number of different monitoring programs throughout the shipping season.

The marine monitoring programs will:

- Measure the effects that the shipping is having on the marine environment
- Assess the accuracy of predictions of effects
- Determine if adaptive mitigation measures need to be developed.

Ship-based Observer Program is not possible in 2021 due to the COVID-19 Pandemic. However, as an alternative, an incidental marine wildlife sighting program is being implemented in collaboration with the Marine Mammal Observation Network (MMON) with a subset of participating vessels.

Marine Mammal Aerial Surveys

Monitors ringed seal density and distribution during spring, and narwhal abundance and distribution and other marine mammal species in Project area throughout the summer.

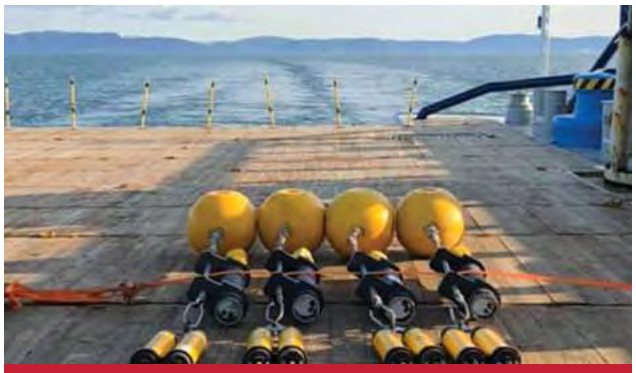
Bruce Head Shore-based Monitoring

Investigates narwhal response to shipping along the Northern Shipping Route by observing them from the top of Bruce Head.

Marine Environmental Effects and Aquatic Invasive Species and Habitat Offset

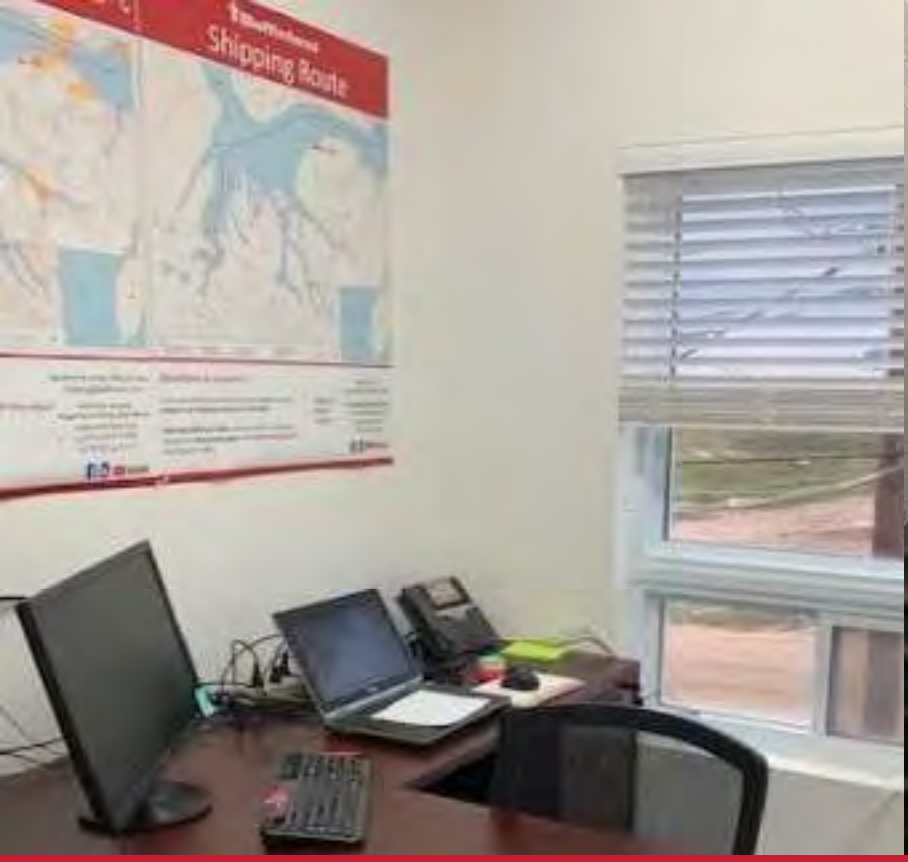
Monitors water and sediment quality including metals, benthic infauna, epifuna and epiflora, fish abundance and health (focus on Arctic char) including contaminant analysis, and ballast water compliance testing.

Implementing Year 2 of 10 year Freight Dock post-construction habitat offset monitoring program to assess functionality.



Passive Acoustic Monitoring

Monitoring of underwater noise at three (3) locations in early August at Bruce Head, Ragged Island anchorage, and Pond Inlet (Small Craft Harbour Construction) until September. Re-deployment of two (2) recorders at the floe edge to record during 2021 fall shoulder season and 2022 floe edge conditions.



COMMUNICATIONS

In order to provide better communications about Baffinland vessel activities, full-time Shipping Monitors will be available over the entire shipping season working from the Baffinland Pond Inlet office located in the Mittimatalik Hunters and Trappers Organization (MHTO) office building (2nd Floor). If you have questions, comments or concerns about Baffinland vessels, please contact Baffinland by visiting one of our Shipping Monitors, or provide your concern to a representative from the MHTO who can then relay the message to Baffinland.

In addition to interacting directly with Shipping Monitors, vessel traffic in 2021 may be monitored through a variety of methods including:

1. Accessing the Baffinland website (www.baffinland.com) and following the path to “Operation>Shipping & Monitoring”, access also available in the Baffinland Pond Inlet office;
2. Visiting the Pond Inlet Baffinland office to observe live tracking of vessels through the Automatic Identification System (AIS) monitoring station, and learning more about the type of vessels that Baffinland requires for its operations;
3. Announcements about upcoming vessel activity will be made on the local Pond Inlet radio at regular intervals;
4. Listening to periodic announcements of daily and upcoming vessel activity on marine VHF radio channel 26;
5. Accessing Facebook pages for Baffinland Iron Mines, Pond Inlet News and Pond Inlet Hunters Information Page for periodic postings about past and future shipping activities.

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QUESTIONS? HERE IS HOW YOU CAN REACH US

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L6H 0C3

If you have questions, comments or concerns about Baffinland vessels, please contact us by visiting one of our Shipping Monitors at the Baffinland Pond Inlet office (in Mittimatalik Hunters and Trappers Organization (MHTO) building, 2nd floor), contact us via marine VHF radio channel 26, or provide your concern directly to the MHTO. For specific vessel operation concerns, please indicate if possible, the name of the vessel and the date of the event, and details about your concern.

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Appendix 3

2021 Shipping Season Update to the North Baffin Communities

July 13, 2021

His Worship Moses Oyukuluk
Mayor Arctic Bay
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David Irngaut
Chairperson, Igloolik HTO
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Qaumayuq Oyukuluk
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His Worship Joshua Arreak
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His Worship Jerry Natanine
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His Worship Erasmus Ivvalu
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Paul Nagmalik
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hbhta@baffinhto.ca

Dear Mayors and Chairpersons,

I am writing to you all today to provide an update on Baffinland's shipping plans for the 2021 shipping season for the Mary River Project.

On April 7, 2021, in advance of what was expected to be the final Public Hearings on the Phase 2 Proposal, Baffinland released a Preliminary Summary of 2020 Narwhal Monitoring Programs. Echoing what we have heard from Inuit, this preliminary summary showed a decline in the Eclipse Sound summer narwhal stock in comparison to earlier estimates. This summary noted that there were several potential factors that may have contributed to the decline in the narwhal stock including underwater pile driving activities in Pond Inlet related to the Small Craft Harbour Project, increased killer whale presence, heavier ice conditions, and increased icebreaking activities.

As a result of the feedback Baffinland has received from the Community of Pond Inlet and the ongoing completion of an important community Project, Baffinland has made the decision to alter its operations and will be delaying the start of the 2021 shipping season to avoid ice-breaking. With this decision, the trigger to commence the beginning of the 2021 shipping season will be the presence of a continuous path of 3/10ths or less ice concentrations between the entrance of Eclipse Sound and Milne Port. This concentration of ice is considered water with very little drift ice that does not require icebreaking. Based on historical ice conditions, waiting for a continuous path of 3/10ths or less ice concentrations represents an approximate 2-week delay from when landfast ice would otherwise be completely broken across the Northern Shipping Route and normal shipping operations would regularly

commence. Attached to this letter is detailed information about our enhanced mitigation measures for the 2021 shipping season.

Community members will see that the icebreaker, MSV Botnica, will still be present for the shipping season to be available for escorts as a precaution, but it will not be engaged in active icebreaking activities nor will it enter Eclipse Sound until 3/10ths or less ice concentrations between the entrance of Eclipse Sound and Milne Port are present. Baffinland plans to continue to use the MSV Botnica for some icebreaking activities in the fall, as in previous years.

Baffinland has made the decision to avoid icebreaking for the Spring 2021 season. This decision is based on direct response to Inuit input and the recognition of an important community based project occurring which overlaps with the planned start of the Baffinland shipping season. As a result, we are applying the precautionary principle that is the foundation of our adaptive management plan.

With construction of the Small Craft Harbour continuing this year, and without knowing what mitigation measures might be placed on that activity, our decision to halt icebreaking for the Spring is based on an abundance of caution, for the benefit of Pond Inlet and to preserve the integrity of the Eclipse Sound summer narwhal stock through any cumulative activities.

The decision to delay shipping in 2021 does present significant risk to the Company and its ability to ship the planned tonnage. The consequences of losing tonnage this year are heightened by the fact that Baffinland is in the process of implementing significant cost restructuring measures aimed at repaying debt and lowering the financial exposure of the operation. This is being done in light of continued regulatory uncertainty, and on the premise that the Mary River Project, at current production levels, is not feasible at lower iron ore prices forecasted for 2022 and beyond, as previously made public by the Company on April 30, 2021.

Baffinland accepts the risks of a delayed shipping season in 2021 because it is committed to responding to the concerns and priorities of Inuit and the community of Pond Inlet, and to the results of its monitoring programs. We are taking a proactive and precautionary approach to environmental management without the benefit of completing an investigation into the 2020 monitoring results and considering all factors that may have contributed to the decline in narwhal.

Baffinland's is listening to Inuit, is flexible in its decision-making and can respond rapidly to concerns in a proactive way, putting environmental protection above operational needs, following the underlying principles of our adaptive management plan.

As always, should any of you have any questions about this information or any other matter please do not hesitate to contact me at megan.lord-hoyle@baffinland.com or 1-416-346-4533.

Sincerely,

Megan Lord-Hoyle

Megan Lord-Hoyle
Vice-President, Sustainable Development
Baffinland Iron Mines Corporation

c.c. Hon. Joe Savikataaq, MLA, Premier of Nunavut
Members of Nunavut's Legislative Assembly for Aggu, Quttiktuq, Amittuq, Uqqummiut, Tununiq
Hamlet Chief Administrative Officers
Mr. Jeremiah Groves, Qikiqtani Inuit Association
Ms. Udlu Hanson, Vice President Community and Strategic Development, Baffinland

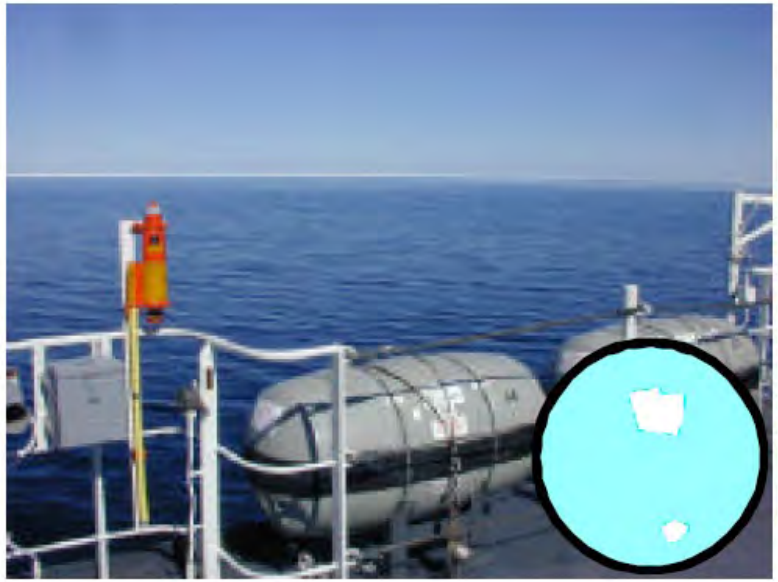
Encl (1)

Enhanced Mitigation for 2021 Shipping Season

- Baffinland will delay the start of shipping to avoid icebreaking.
- Operationally, the trigger to commence the beginning of the 2021 shipping season will be the presence of a continuous path of 3/10ths or less ice concentrations between the entrance of Eclipse Sound and Milne Port.
- Based on historical ice conditions, this **represents an approximate 2-week delay (12 days) from when landfast ice would otherwise be completely broken across the Northern Shipping Route** and normal shipping operations would regularly commence.
- The input of the Hamlet of Pond Inlet and MHTO are driving this enhanced mitigation

Possible in 2021

Paused in 2021



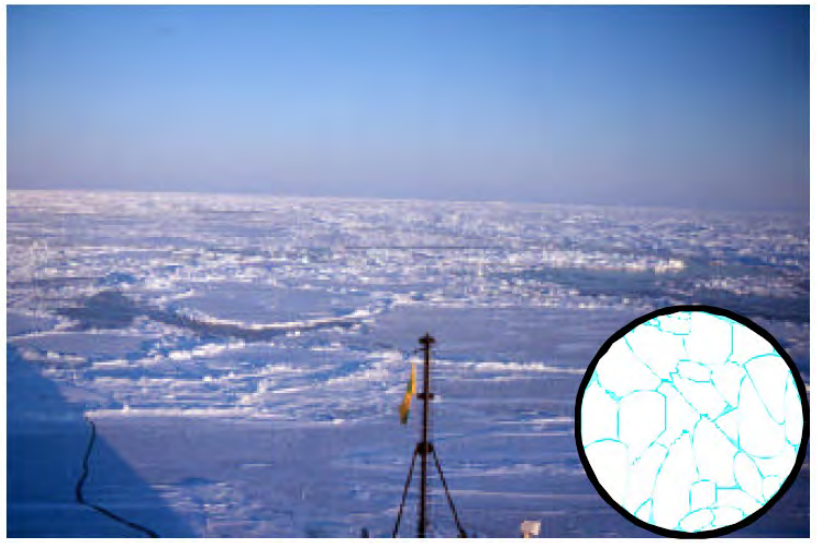
less than 1 tenth
open water

1 - 3 tenths
very open drift

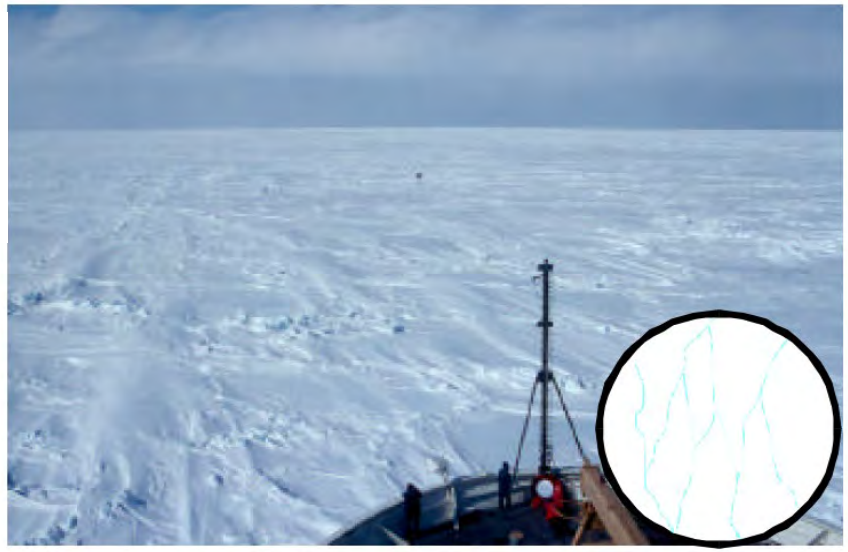
4 - 6 tenths
open drift

7 - 8 tenths
close pack/drift

9 tenths
very close pack



9+ tenths
very close pack



10 tenths
compact/consolidated ice

- To avoid icebreaking it is possible that vessels may have to depart from the nominal shipping route

- Any departures would continue to avoid agreed upon restricted areas (yellow hash marks), and maintain a good distance from Pond Inlet

Implications of Enhanced Mitigation

- The decision to further delay shipping in 2021 creates significant risk to the operation and the ability to transport this year’s planned 5.75 Mt of iron ore from Milne Port
- Based on current ice reports, ice conditions are expected to be heavier this year than in 2020, which may cause an even longer delay to shipping
- Baffinland acknowledges that the construction of the Small Craft Harbour will continue to overlap with our shipping season; additional mitigations in 2021 will serve to reduce potential combined effects of these projects
- Commitments for the 2021 shipping season reflect our commitment to adaptive management and the Company's respect for Inuit input

ᕗᓪᓕᐃ 13, 2021

ᓂᕆᔨᖓᓂᖅ ᒍᔪᔪ ᐅᔪᓂᒍᑐᒃ
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ᒪᐃᔾᓄᑦ, ᐃᒃᔪᓂᐅᑕᓄᓪᓗ,

ᑎᑎᕋᕐᕕᓴᔪ ᐅᓪᓗᒥ ᑐᓴᖅᑎᓇᓕᒃᓯᓕᒃ ᓯᓚᐅᓪᓕᐊᑦᑯᑦ ᐅᔪᒃᖁᑕᕋᓗᑦ ᕿᓇᒃᓴᖓᒪᕋᖅᑐᑦ 2021–ᒧᑦ ᓄᓇᕗᒻᒥᓂ ᐱᓕᓕᒫᑦ.

ᐊᐃᕐᓚᓂ 7, 2021–ᒥ, ᔪᓄᓂᐊᓂ ᓂᓚᐅᑎᕐᐅᓪᓕᐅᖅᑐᑎᑦ ᑭᖓᓪᓕᖅᕿᓗᑦ ᐃᓄᓪᒧᑦᓴᖅᑐᑦ ᐱᓪᓚᓂᐅᓪᓕᐊᓂᖅ ᐱᓪᓚᓂᐅᐸᑦ ᓯᓚᐅᓪᓕᐊᓂᖅ ᐱᓪᓚᓂᐅᓪᓕᐊᓂᖅ, ᕿᓇᒃᓴᖓᒪᕋᖅᑐᑦ ᐱᓪᓚᓂᐅᓪᓕᐊᓂᖅ

ᓱᑯᖅᑭᓂ ᐊᑯᓕᐅᓂ ᐃᓱᓚᐸᑦ ᑕᓱᐅᔭᖏᑦ ᖃᖏᐻᐊᓄᐊᓚᐊᒍᓪᓗ. ᐸᓴᓕᓪᑯᑦ ᐸᖏᓐᓂᑦ ᐊᑐᐃᓕᓴᒪᓪᓗᓂᓪᓗ MSV ᐸᑦᓂᖅᑎᑲ ᓱᑯᐅᖏᓪᓗᓂᑲ ᐅᑭᐊᖅᓴᑯᑦ ᖃᒪᑲᑕᑎᓕᓂ ᐊᖏᕐᕿᒍᑎᓂᑦ.

ᐸᓴᓕᓪᑯᑦ ᓱᑯᓱᐅᑭᒪᓕᐅᙳᕐᓕᑦ ᐅᐱᖏᓐᓇᒥ 2021–ᒥ ᐅᓱᖅᖃᑕᖏᓐᖏᒥ. ᑕᑯᓐ ᖃᓄᖃᑐᖏᓂᖃᖅ ᑐᙳᖅᓴᓂᖃᖅ ᖃᓄᐊᑎᓂᒃ ᐊᓕᐅᖏᑎᓂᖅᓱᑯᑐᒍᑦ ᐸᖏᓐᓂᑲᑦ ᐱᑎᐊᖏᓂᒃ ᐸᖏᓐᓂᑕᐅᓱᒪᔪᖏᒍᑦ ᐸᓴᓕᓪᑯᑦ ᐅᒥᐊᖏᓂᔪᑦᑐᖅ ᐅᓱᖅᖃᑕᖏᓐᓇᖅᓯᓂᖅ. ᑕᐃᒪᐃᓚᒪᑦ, ᐱᓴᕆᖃᓱᒪᓕᔪᒍᑦ ᑐᙳᖅᓴᓂᖃᖅ ᐊᒃᑭᑎᐊᑕᓇᖅᑐᓄᓂᑦ ᐊᐅᓪᓕᑎᓂᓂᓄᑦ ᐸᖏᓐᓇᖅᑐᓂᖅᓴᓂᑦ.

ᓴᓇᐅᙳᖏᓪᓇᖏᓂᐊᖅᑎᓪᓗᒍ ᑐᓪᓚᐅᑕᖏᕕᖅ ᑕᒧᓂ ᐊᖏᓂᒍᒥ, ᖃᐅᔨᒪᓇᑕᓗ ᑭᓱᓂ ᐱᐅᙳᖏᑐᑐᓄᑦ ᒥᑭᓪᓚᐊᑭᑎᖃᖏᓐᓄᑦᖃᓕᓴᐅᓂ ᐱᓪᓗᔪᓄᑦ, ᖃᓄᖅᑐᑎᓂᒃᓴᖅᓯᒪᔪᑦ ᑲᑎᒪᔨᖅᑕᐅᓇᖅᑐᓄᑦ ᐱᓱᖅᖃᑕᖏᓐᓇᖅᓯᓂᑦ ᐱᐅᙳᖏᑐᑐᓄᑦ ᐸᐃᑦ

Enhanced Mitigation for 2021 Shipping Season
ᐱᐅᓯᒋᐊᖅᓯᒪᔪᑦ ᐱᐅᖏᑦᑐᓄᑦ ᒥᑭᓕᒋᐊᕈᑎᑦ 2021ᒧᑦ ᐅᒥᐊᕐᕕᐊᑲᑦ ᐅᓯᑲᖅᑕᕐᓇᖅ

- Baffinland will delay the start of shipping to avoid icebreaking.
- Operationally, the trigger to commence the beginning of the 2021 shipping season will be the presence of a continuous path of 3/10ths or less ice concentrations between the entrance of Eclipse Sound and Milne Port.

- ᐸᖅᓭᓐᓂᓐᓄᑦ ᑭᖓᔪᓭᓇᐊᖅᑎᑦᑎᓂᐊᖅᑐᑦ ᐅᓯᑲᖅᑕᕐᓂᕐᒥᐸᖅ ᐅᒥᐊᕐᕕᐊᑲᑦ ᓯᑦᓯᐅᕈᒪᓇᑎᖅ.
- ᐊᐅᓪᓚᕐᓄᑦ ᑕᑯᓴᔭᒍ, ᐊᐅᓪᓚᕆᐅᑕᐅᕕᖅ ᐱᒋᐊᕈᑕᐅᔭᓂᓂ 2021ᒥ ᐅᒥᐊᕐᕕᐊᑲᑦ ᐅᓯᑲᖅᑕᕐᓇᕐᒧᑦ ᐱᑕᖅᓚᕈᓂ ᐃᖏᕐᕋᐃᓐᓇᕐᓇᖅᑐᒥᐸ 3/10 ᑎᒧᓂᔭᓐᓂᑦ ᓯᑦᖅᕐᓂᕐᓂᐸ ᐃᓯᓇᐊᖓᓂᑦ ᑕᓯᐅᕆᕐᒧᑦ ᖃᖏᕐᐳᐊᓕᐊᕐᒧᓴᔭᒍ.

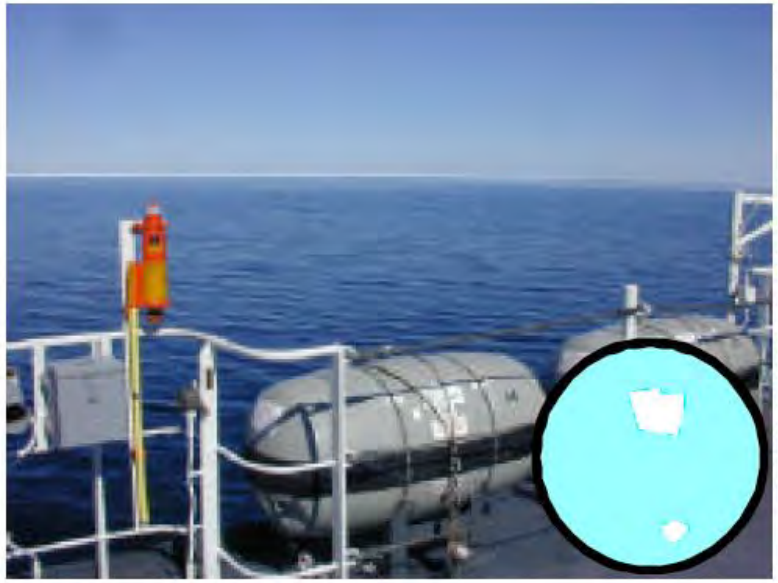
Enhanced Mitigation for 2021 Shipping Season
ᐱᐅᓯᒋᐊᖅᓯᒪᔪᓕ ᐱᐅᖏᑦᑐᓄᓂᒃ ᒥᐱᓪᓕᒋᐊᕐᑏᑎᑦ 2021ᒧᑦ ᐅᒥᐊᖅᔪᐊᑲᓗᑦ ᐅᓯᒃᖁᑦᑕᖅᓭᖅ

- Based on historical ice conditions, this **represents an approximate 2-week delay (12 days) from when landfast ice would otherwise be completely broken across the Northern Shipping Route** and normal shipping operations would regularly commence.
- The input of the Hamlet of Pond Inlet and MHTO are driving this enhanced mitigation

- ᖃᒪᖃᑕᒋᓐᓂᖅ, ᓯᑯᖃᖅᓂᐅᓪᓚᐅᖅᑐᑦ ᒪᓕᒃᓴᒋᑦ, ᑕᕆᓇ **ᑭᓱᖃᖅᑐᐃᔪᖅ ᒪᖅᑭᓚᓄᓂ ᐱᓇᓯᐊᑭᓯᖏᓚᓄᓂ ᑭᖑᒧᐊᓇᐊᖅᓂᖅᑎᑲ (12 ᐅᓪᓗᖅ) ᑐᐊᖅᑭᐅᓂᒃᑎᑕᐊᖏᖅᓴᓂᖅ ᐅᐊᖅᓇᒥ ᐅᒥᐊᖅᔪᐊᑲᓂ ᐅᓯᖅᑕᖅᑐᓄᓂ ᐊᖅᑯᑎᐊᒍᑦ** ᐅᒥᐊᖅᔪᐊᑲᓪᓗ ᐅᓯᖅᑕᓕᖏᖅᓴᑎᖅ.
- ᑐᓴᖅᑕᐅᔪᑦ ᕿᐊᒪᓪᓕᑲᑦ ᒥᑦᑎᒪᑕᓕᖅᑎᐅᓂᑦ ᒥᑦᑎᒪᑕᓕᖅᑎ ᐊᖏᔪᓇᓯᑐᑐᓄᓚᕐᑲᑦᑐᓪᓗᓕᒃ ᐊᐅᓪᓚᐅᑕᐅᓗᐊᖅᑐᑦ ᑕᑲᓯᒍᖏᑦ ᐱᐅᖏᑦᑕᓄᓂ ᐱᐅᓯᒋᐊᖅᓯᒪᔪᖅᒧᑦ ᐱᐅᖏᑦᑕᓄᓂ ᒥᑭᓕᑕᐅᑎᓪᓗᑦ

Possible in 2021 | ᐱᖅᓴᖅ 2021ᒥ

Paused in 2021 | ᓄᖅᑲᖏᒪᑲᐃᓐᓇᖅᑎᑕᐅᔾᔨᖅ 2021ᒥ



ᑎᒋᓂ 1/10 ᓱᑯᓕᒃ

ᐃᒪᐅᓗᓂ

less than 1 tenth

open water

1 - 3 tenths

very open drift

1/10ᒥᑦ 3/10ᒍᑦ

ᓱᑯᓕᒃ

ᐃᒪᐃᓐᓇᑲᓴᒃ

4/10ᒥᑦ 6/10ᒍᑦ ᓱᑯᓕᒃ

ᐃᖏᕐᕋᔨᓂᒃ ᓱᑯᓕᒃ

4 - 6 tenths

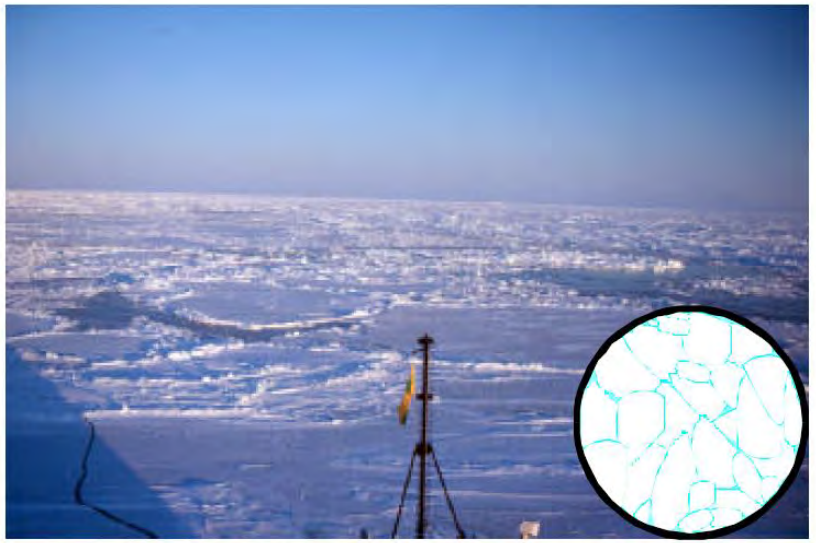
open drift

7/10-8/10ᒧᑦ ᓱᐊᖏᖅᓂᑦ
ᓱᐊᖏᓪᓚᕆᔭᖅ

7 - 8 tenths
close pack/drift

9/10 ᓱᐊᖏᖅᓂᑦ
ᓱᐊᖏᓪᓚᕆᔭᖅ

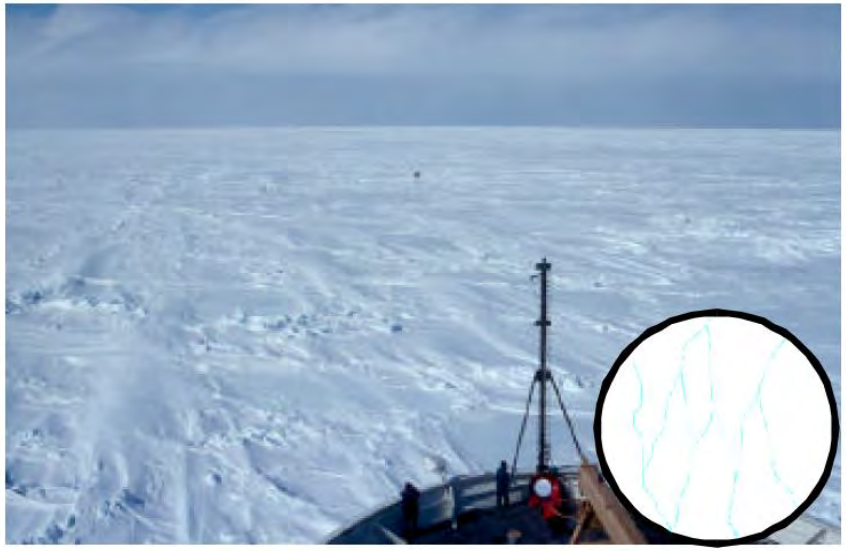
9 tenths
very close pack



9/10 ᓱᐊᖏᖅᓂᑦ
ᓱᐊᖏᓪᓚᕆᔭᖅ

9+ tenths
very close pack

10/10 ᓱᐊᖏᖅᓂᑦ
ᓱᐊᐃᓐᓇᖅ ᐃᓗᐃᑦᑐᖅ

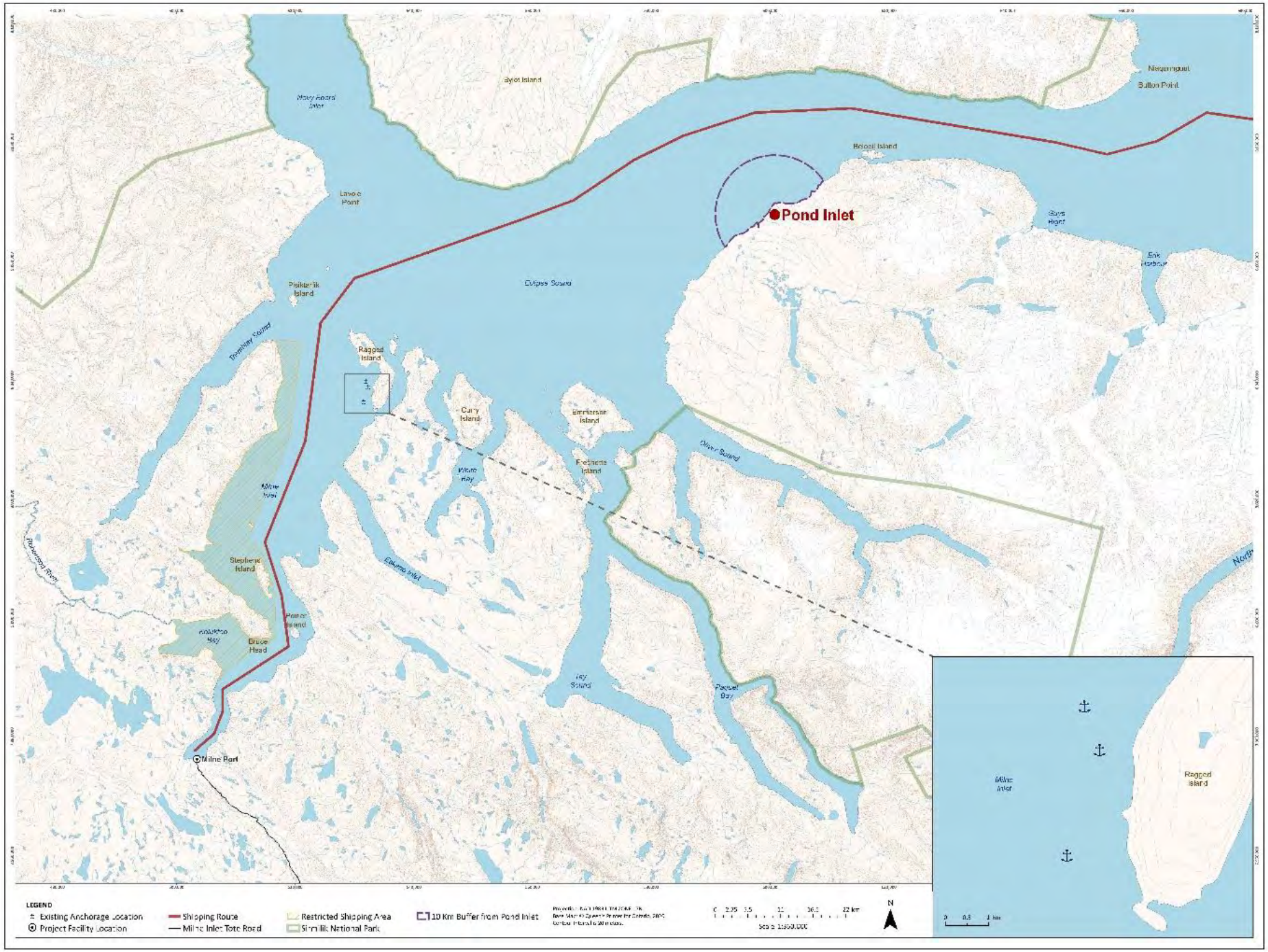


10 tenths
compact/consolidated ice

- To avoid icebreaking it is possible that vessels may have to depart from the nominal shipping route

- Any departures would continue to avoid agreed upon restricted areas (yellow hash marks), and maintain a good distance from Pond Inlet

- ᓱᑯᐱᐅᖏᑯᓪᓗᒋᑦ ᐊᔪᖏᓐᓇᖅᓯᒪᔪᖅ ᐅᒥᐊᖏᔪᐊᑦ ᖃᒪᒋᐊᖅᑐᐃᓐᓇᓗᐊᓕᓪᓚᑦ ᐊᖅᑯᑎᑎᒍᔪᖅᑕᒥᓂᑦ
- ᓇᓚᐊᑐᐃᓐᓇᑦ ᖃᒪᐃᓂᑦ ᒪᓕᓐᓇᕆᖅᑐᑦ ᐊᓐᓂᖅᑕᐅᓱᒪᔪᓂᑦ ᐅᐸᒋᐊᖅᓐᓂᑐᐃᑦ (ᖁᑯᖅᓱᖅᑕᑦ) ᐅᓐᓴᓕᓐᓇᖏᓐᓄᓪᓗ ᒥᑎᒪᒋᑕᓚᓐᒥᑦ



Implications of Enhanced Mitigation

ᖃᓄᐃᖅᑲᓇᑎᑕᐅᔪᓂ ᐱᐅᓯᑎᐊᖅᓯᒪᔪᓂᓂ ᐱᐅᖏᑎᓂᑐᓄᓂ ᒥᑭᓕᑎᐊᕈᑎᓂᓂ

- The decision to further delay shipping in 2021 creates significant risk to the operation and the ability to transport this year’s planned 5.75 Mt of iron ore from Milne Port
- Based on current ice reports, ice conditions are expected to be heavier this year than in 2020, which may cause an even longer delay to shipping

- ᑭᖏᓂᓀᐊᖅᓯᐅᖅᓂᕐᒥᓄᖅ ᐅᒥᐊᕐᕕᐊᖅᑯᓂ ᐅᓯᐅᖅᑕᕐᓀᒥᖅ 2021ᒥ ᐅᓗᓀᐊᓀᖅᑐᓀᐅᑦᓀᑦᓂᖅ ᐊᐅᓀᓂᕐᓄᓂ ᐅᓯᐅᖅᑕᑭᓀᕐᓂᕐᓄᑦᓗ ᑕᒪᓂ ᐊᕐᕋᔪᒧᑦ ᐅᓗᓀᐊᓀᖅᑐᓀᐅᑦᓀᑦᓂᖅ ᐊᐅᓀᓂᕐᓄᓂ ᐅᓯᕕᓀᕐᓂᕐᓄᑦᓗ ᑕᒪᓂ ᐊᕐᕋᔪᒥ ᐅᓯᐅᖅᔪᒪᕕᓄᑦ 5.75 ᒥᓂᐊᓀ ᑕᓀᓴᓂᖅ ᓴᐃᕆᖅᓴᓂᖅ ᕿᑭᓯᐊᓂᑦ
- ᒪᓂᓴᑎᑦ ᐃᓀᓇᐅᕐᔪᖅ ᓯᑯᓄᑦ ᐅᓂᖅᑲᓪ, ᓯᑯᖏᖅᓂᖅᓴᐅᓂᐊᕆᑕᐅᖅᑕᕐᔪᖅ ᑕᒪᓂ ᐊᕐᕋᔪᒥ 2020 ᒥᓂᑦ, ᑭᖏᓂᐅᑕᐅᖅᑲᓀᓂᑐᐃᓀᓇᓀᐊᖅᖅᑐᖅ ᐅᓯᐅᖅᑕᕐᓂᕐᓄᑦ

Implications of Enhanced Mitigation

ᖃᓄᓇᐃᒃᑲᕿᕐᕆᐊᑦ ᐱᐅᓯᕆᐊᖃᓯᒪᔪᓂᑦ ᐱᐅᖏᕆᑦᑐᓄᑦ ᒥᑭᓪᓗᕆᐊᕈᑎᓂᑦ

- Baffinland acknowledges that the construction of the Small Craft Harbour will continue to overlap with our shipping season; additional mitigations in 2021 will serve to reduce potential combined effects of these projects
- Commitments for the 2021 shipping season reflect our commitment to adaptive management and the Company's respect for Inuit input

- ᐸᖅᓯᓐᓂᓐᓄᑦ ᑐᑭᓯᖅᑐᑦ ᑐᓪᓚᒃᑕᕐᕕᐅᓪᑕᖅᑐᑦ ᐊᑕᐅᑦᑎᒃᑯᓯᕐᓗᐊᖅᑐᖅ ᐅᒥᐊᖏᐊᒃᑯᑦ ᐅᓯᖅᖃᑕᖏᓐᓇᖅᑐᓄᑦ; ᓯᓪᒃᖃᓐᓂᑦ ᐱᐅᖏᕆᑦᑐᓄᑦ ᒥᑭᓪᓗᕆᐊᕈᑎᒋᑦ 2021ᒥ ᐊᑐᑎᖃᖏᓯᐊᖅᑐᑦ ᒥᑭᓪᓗᕆᐊᕈᑕᐅᓗᑎᒃ ᖃᑎᒌᑦᑐᓄᑦ ᐊᓵᑐᐃᓂᐅᑐᐃᓐᓇᖅᑐᓄᑦ ᑕᒃᑯᓀᓐᓄᑦ ᐱᓕᕆᓚᓂᖏᓂᑦ

- ᐊᓐᕆᖅᓯᒪᓂᑦ 2021ᒥ ᐅᒥᐊᖏᐊᒃᑯᑦ ᐅᓯᐅᕿᖅᑕᖏᓐᓇᖅᒥ ᐊᖅᑭᒥᐊᕈᓀᓐᓇᖅᑐᓄᑦ ᐊᐅᓚᑦᑎᓂᖏᑦ ᖃᒻᒪᓕᒃᑐᑦ ᐃᓄᐃᓐᓂᖅᓯᓐᓄᑦ ᐃᓄᖅᓂᑦ ᑐᑭᖅᑕᒥᓗᑦ