

Baffinland Iron Mines Corporation

Mary River Project

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



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APPENDICES

Appendix 1 – 2023 Shipping and Marine Monitoring Summary

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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 |
| MMASP | Marine Mammals Aerial Survey |
| MTPA | Million Tonnes Per Annum |
| NAMRP | Narwhal Adaptive Management Response Plan |
| NIRB | Nunavut Impact Review Board |
| NIS | Non-Indigenous Species |
| NLCA | Nunavut Land Claim Agreement |
| PIP | Production Increase Proposal |
| PIPE | Production Increase Proposal Extension |
| PIPR | Production Increase Proposal Renewal |
| RSA | Regional Study Area |
| SOP | Sustaining Operations Proposal |
| SSA | Stratified Study Area |
| the Project | Mary River Project |
| QIA | Qikiqtani Inuit Association |
| UAV | Unmanned Aerial Vehicle |

1 INTRODUCTION

1.1 BACKGROUND

Project Certificate No. 005 (Amendment 04, dated November 3, 2022), requires that Baffinland Iron Mines Corporation (Baffinland) 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 (6) 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 Mittimatalik Hunters and Trappers Organization (MHTO) and the Department of Fisheries and Oceans Canada (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 2023 SHIPPING OPERATIONS

2.1 2023 SHIPPING OPERATIONS

Baffinland is currently approved to ship 4.2 million tonnes of iron ore over the 2023 shipping season along the Northern Shipping Route. On March 16th, 2023, Baffinland submitted an application to the NIRB for a Sustaining Operations Proposal (SOP), which would allow Baffinland to ship 6.0 million tonnes of iron ore, as well as stranded ore from the previous year, until December 31st, 2024 if approved. On April 14th, 2023, Baffinland submitted the Final Environmental Impact Statement (FEIS) Addendum as part of the SOP application, which summarizes potential Project-related impacts, inclusive of potential effects due to shipping, on the marine environment under the 6.0+ million tonnes scenario. This report is designed to cover either a 4.2 mtpa or 6 mtpa season.

The first vessels are anticipated to enter the Regional Study Area (RSA) between August 1 and August 7, subject to prevailing ice conditions. Refer to Figure 2.1 for an example of ore carriers that will be travelling to Milne Inlet throughout the 2023 shipping season. Consistent with 2022, vessels will not enter the RSA until a continuous path along the Northern Shipping Route (see Figure 2.2) of 3/10ths ice concentrations or less is confirmed. As per Section 3.2.1 of the Draft 2023 Shipping and Marine Wildlife Management Plan (SMWMP; Baffinland, 2023a), ice concentrations is defined as: *a ration expressed in tenths (/10) describing the area of water surface covered by ice as a fraction of the whole area*. The draft 2023 SMWMP is currently available on the NIRB Public Registry for intervenor responses and details pertaining to the draft SMWMP are as follows: NIRB File No. 08MN053; Application No. 125710; Public Registry Identification No. 344991.

Baffinland will continue to confirm the floe edge is closed to hunters prior to commencement of the shipping season. Baffinland will notify the MHTO and Hamlet in writing 72, and 24 hours in advance of the first anticipated vessels transiting to Milne Port. Vessels will hold at least 40 km to the east of the RSA until approved by the Port Captain to enter and sail towards Milne Port (see Figure 2.3).

See Table 2.1 below for respective definitions and Table 2.2 for anticipated vessel movements for the 2023 season.

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. For additional information pertaining to transits, please review the Operational Guide for Ore Carrier Convoys, which is Appendix F in the most recent draft of the Shipping and Marine Wildlife Management Plan (Baffinland, 2023a). |
| Convoy | The movement of one or more vessels at the same time tRagged Island and/or Milne Port during either escort or instructed to travel as a group.. In 2022, Baffinland regularly implemented convoys and achieved a 20% reduction in the total number of vessel transits compared to a system without convoys. In 2023, Baffinland will continue to implement convoys, when deemed safe to do so. For additional information pertaining to transits, please review the Operational Guide for Ore Carrier Convoys, which is Appendix F in the most recent draft of the Shipping and Marine Wildlife Management Plan (Baffinland, 2023a). |

Table 2.2: Anticipated Vessel Transits in 2023

| Vessel Type | Anticipated Number of Voyages to/from Milne Port | Anticipated Number of Transits to/from Milne Port | Note |
|--------------------------|---|---|--|
| Icebreaker (MSV Botnica) | Will be primary escort vessel available as needed from end of September to October 31 | | <p>The icebreaker will not be present at the beginning of the shipping season and is anticipated to first arrive in Milne Port at the end of September. The icebreaker will 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 (MMON) program while transiting along the Northern Shipping Route. The Botnica will also be used to retrieve two acoustic monitors near Ragged Island and Bruce Head in early October, which will be deployed in early August using Baffinland's research vessel. The acoustic recorders will be redeployed after retrieval by the Botnica to capture any potential dual icebreaker transits at the end of the 2023 shipping season. The purpose of retrieving the acoustic recorders prior to overwintering is to ensure that acoustic data from the 2023 shipping season is downloaded to allow Baffinland to speak to monitoring results related to any cape-sized vessel transits that could occur in 2023.. In October, the Botnica will serve as the platform for the Shipboard Observer Program (SBO), where marine mammal observers monitor for ship strikes while icebreaking is occurring.</p> <p>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 escort (convoy scenario) during observed ice conditions. Icebreaker operations are limited to when escort of vessels is required.</p> |
| Icebreaker (MSV Fennica) | Will be contingency escort vessel available as needed from end of September to October 31 | | <p>The icebreaker will not be present at the beginning of the shipping season and is anticipated to first arrive in Milne Port at the end of September. The icebreaker will be available for escort as a precaution, if required by a vessel owner. The MSV Fennica may also provide emergency response support, if required and may participate in the Marine Mammal Observer Network (MMON) program while transiting along the Northern Shipping Route.</p> <p>The Fennica is not intended to provide support for</p> |

| Vessel Type | Anticipated Number of Voyages to/from Milne Port | Anticipated Number of Transits to/from Milne Port | Note |
|-----------------------|--|---|--|
| | | | marine monitoring programs. The Fennica will only be used to escort vessels along the Northern Shipping Route at the end of the shipping season if ice conditions pose safety challenges requiring additional support. Unlike the Botnica, the Fennica will only be activated if anomaly ice conditions like those experienced in October 2022 occur again, otherwise the vessel will be anchored at Milne Port. |
| 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. The intention is to have the tugs depart together with the last ore carrier(s) and icebreakers in a convoy. |
| Ore Carriers | 56 to 60 75 to 84 | 112 to 120 150 to 164 | Vessels will range in size from Supramax to Cape size (Newcastlemax) Baffinland is approved to ship 4.2 million tonnes of iron ore in 2023. If the Sustaining Operations Proposal (SOP) is approved by the NIRB, then Baffinland will ship 6.0+ million tonnes of iron ore in 2023 on no more than 84 ore carriers. |
| Resupply Cargo Vessel | 2-3 | 4-6 | Cargo vessels may be serving other Nunavut communities either before or after delivery to Baffinland. In 2023, some cargo vessels may be employed for the purposes of backhauling equipment from site. |
| Fuel Tanker | 4 | 8 | Fuel tankers may be serving other Nunavut communities either before or after delivery to Baffinland. |



Figure 2.1: **Convoy of Three Ore Carriers on July 31, 2022.**

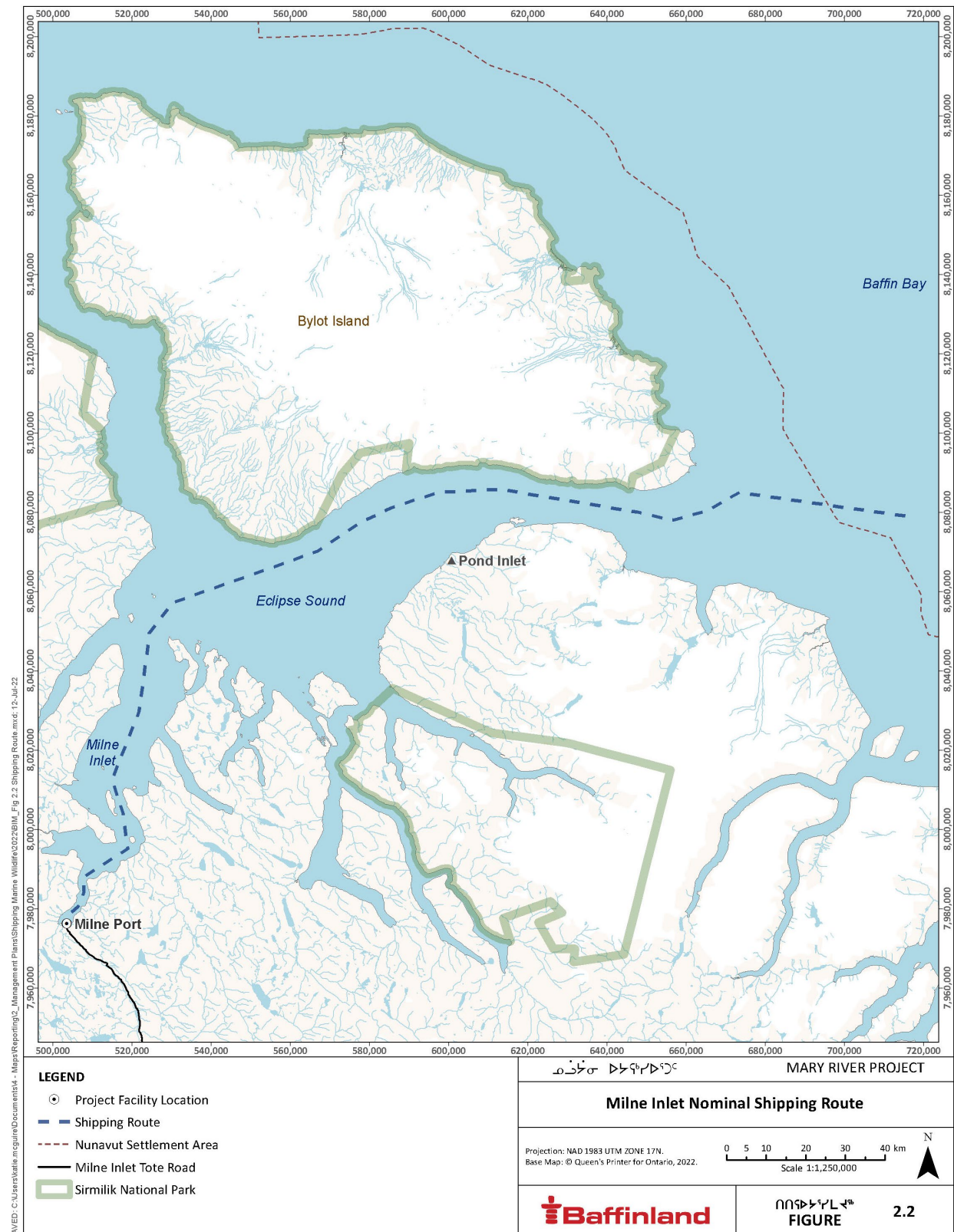


Figure 2.2: Milne Inlet Nominal Shipping Route



Figure 2.3: Shipping Route Buffer Zone

3 ANCHORING AND DRIFTING AREAS

3.1 CONTEXT

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

3.2 2023 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 2023. Vessels waiting for an anchorage at Milne Port will continue to anchor to the west of Ragged Island in North Milne Inlet. Vessels undergoing post arrival formalities, including cargo inspections and ballast water salinity testing, will anchor within the vicinity of Milne Port prior to berthing at the Ore Dock (Figure 3.1).

3.2.1 Community Engagement and Feedback

During a visit to the Mary River Project in 2018, the MHTO proposed two alternative anchorage locations for Baffinland to consider (Eskimo Inlet and South Bylot), as well as an alternative location for vessel drifting (entrance to Baffin Bay). During the pre-shipping season meeting held in Pond Inlet on June 25th, 2019, the MHTO proposed two additional alternative anchorage locations: Guys Bight and Erik Harbour.

In 2020, Baffinland undertook an options exercise of five alternative locations proposed by the MHTO for anchoring and drifting 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. Table 3.1 below provides a brief summary of rationale for deeming each proposed alternate location as unsuitable. Additional details pertaining to Baffinland's options exercise are summarized in a memorandum that was provided to the North Baffin Hamlet and Hunters and Trappers Organizations (HTOs) on January 13, 2020 (NIRB Registry No. 330789).

Table 3.1: Proposed Anchorage Locations and Rationale for Rejection by Baffinland

| Proposed Alternative Location From MHTO | Purpose of Proposed Location | Rationale for Rejection of Proposition by Baffinland |
|---|------------------------------|--|
| Eskimo Inlet | Anchorage | <ul style="list-style-type: none"> Too narrow – only 1.5 nautical miles (nm) wide at greatest extent, which presents safety risk for vessels transiting through corridor. Exposed nature of inlet increases risk of vessels being trapped by ice Water depth is unsuitable for anchoring (>250 m) |
| South Bylot | Anchorage | <ul style="list-style-type: none"> Proposed location is in the current shipping lane, which would result in rerouting vessel traffic closer to Pond Inlet to reduce safety risks of vessel overlap Leaves vessels exposed to extreme weather events (ie. high winds, ice bergs) Water depth is unsuitable for anchoring (>300 m) |
| Guys Bight | Anchorage | <ul style="list-style-type: none"> Potentially has suitable depths for anchorage Existing nautical charts are not detailed enough to confirm the feasibility of safe anchorage in this area |

| Proposed Alternative Location From MHTO | Purpose of Proposed Location | Rationale for Rejection of Proposition by Baffinland |
|---|------------------------------|---|
| | | <ul style="list-style-type: none"> Could present potential disruptions to the loading sequence given the considerable distance to Milne Port (120 nm) |
| Erik Harbour | Anchorage | <ul style="list-style-type: none"> Difficult to enter due to a rocky outcropping near the entrance to the Harbour – vessels would need to anchor at the entrance, leaving them exposed to drifting ice from Pond Inlet Water depth is unsuitable for anchoring (>100 m) |
| Entrance to Baffin Bay | Vessel Drifting | <ul style="list-style-type: none"> Very exposed to weather and ice conditions, which presents safety concerns |

Baffinland remains open to exploring feasible alternatives (or further modifying current practices) to anchoring at Ragged Island to minimize interference of shipping on land users, and welcomes feedback from the MHTO and community members of Pond Inlet. Feedback is solicited through various engagements, such as the NIRB marine mitigation workshops, pre-and post-shipping season meetings, pre- and post-shipping radio shows, Marine Environment Working Group (MEWG) meetings, and intervener comments on annual reports related to shipping and the marine environment. For an anchorage location to be deemed suitable for use, it must provide adequate shelter from adverse weather conditions, be within an area that is wide enough for vessels to pass safely, and be of a suitable depth. A suitable anchorage depth varies depending on the size of the vessel. Generally, the length of the anchor chain for the vessel must be 5x the depth of the anchor pocket to the seafloor. For example, 100 m of anchor chain would be required to safely anchor the vessel if the depth of the anchor pocket to the seafloor is 20 m. A supramax vessel traditionally has an anchor chain that is 275-300 m long, which means that the water must be a maximum of 55-60 m deep in order to anchor safely—these are the smallest vessels currently contracted by Baffinland. Cape sized vessels, the largest to potentially be contracted by Baffinland, generally have anchor chains that are 355-385 m in length, which therefore require a maximum depth of 71-77 m. In order to accommodate all Baffinland vessels, **any proposed anchorage locations must be a maximum of 55 m deep.**

Until alternative requests are made, Baffinland will continue to minimize impacts on hunters and those traveling on water by enforcing that no more than three (3) ore carriers anchor at Ragged Island at any time. Baffinland also commits to avoiding its 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, ore carriers are prohibited from discharging grey water and sewage throughout the RSA.

Baffinland held a pre-shipping meeting in Pond Inlet with the Hamlet on June 28th, 2023, as well as a pre-shipping radio show on June 27th, 2023. No comments/questions related to anchoring or drifting were raised at these two specific engagements.

3.2.2 Marine Environmental Working Group (MEWG)

Since the release of the 2022 Marine Shipping Report and Vessel Management Report to the NIRB on July 19th, 2022, six MEWG meetings were held. The dates of these meetings are as follows:

- August 4, 2022;
- December 2, 2022;
- February 15th, 2023;
- February 16th, 2023;
- April 19th, 2023; and
- July 12th, 2023.

No comments related to Baffinland's anchorage locations were raised by the MEWG, including MHTO, during these meetings.

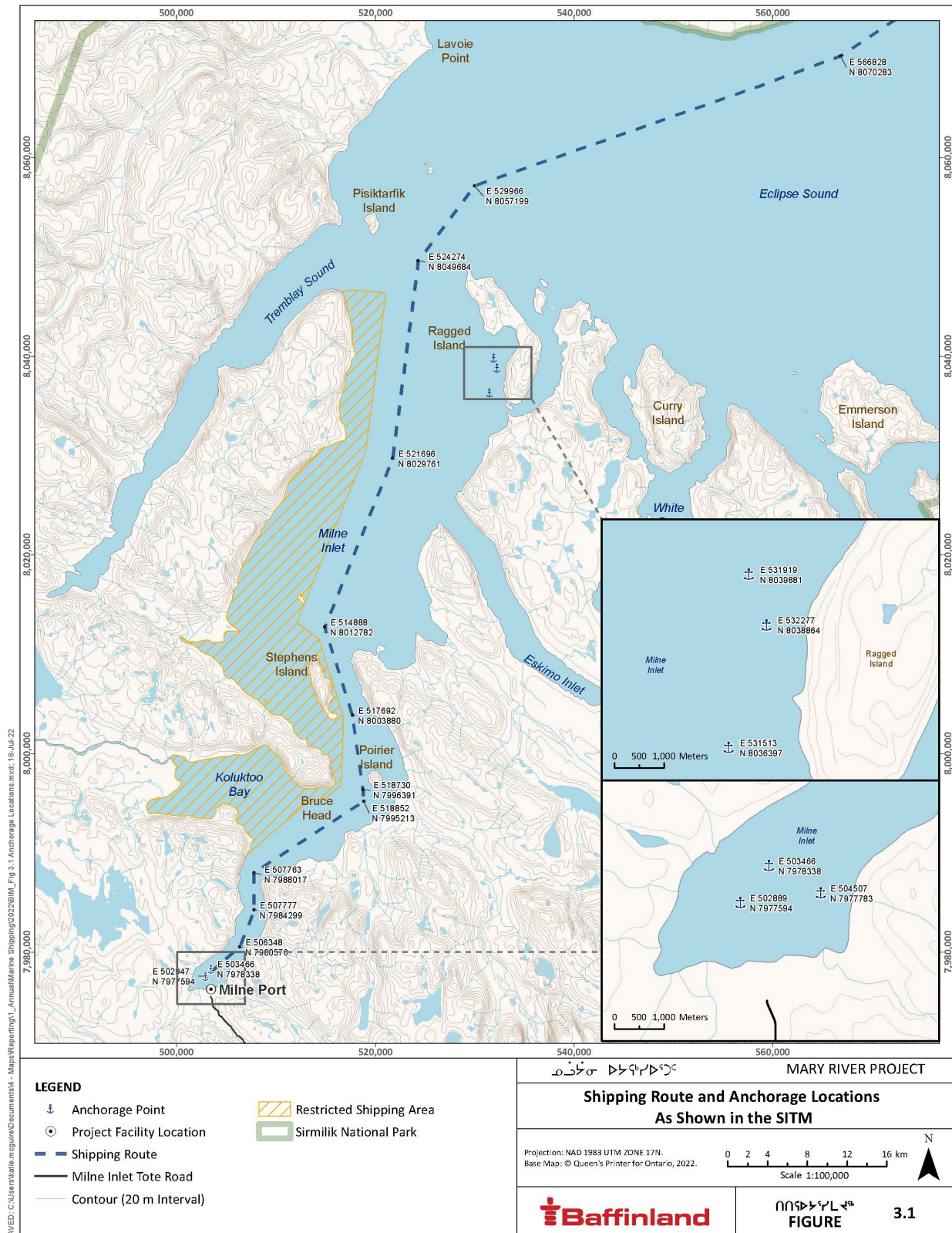


Figure 3.1: Shipping Route and Anchorage Locations

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 typically 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 hosted a Pre-Shipping Season Meeting with representatives of MHTO and the Hamlet of Pond Inlet (the Hamlet) on June 28, 2023. Local QIA representation was not present, though notification of this engagement was communicated verbally the week of June 12 th and via email June 20 th , 2023. |
| | Confirmation of floe edge closure | Baffinland became aware the MHTO issued closure of the floe edge through social media on July 11, 2023. |
| | Official start of shipping season | Baffinland notified the MHTO, Hamlet of Pond Inlet and the QIA in a letter dated July 13, 2023, meeting its commitment to advance notification 72 hours before anticipated start of shipping. Additional letters sent 24 hours before start of any shipping activity upon further refinement of start of shipping based on latest ice conditions. |
| | Ongoing shipping activities-related communications | Baffinland maintained active communication with the MHTO and residents of Pond Inlet about anticipated shipping operations and will continue to do so 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. |
| During Shipping | Ongoing shipping activities-related communications | Shipping Monitors based in Pond Inlet have been hired and are in place for ongoing communications with residents. |
| | | Dedicated email address (shipping@baffinland.com) for concerns, questions and comments directed to Baffinland is active and monitored. |
| | | Maintain comment/concern tracker relevant to shipping season. Posting of Shipping and Marine Monitoring Summary brochure, including Shipping Route, in key locations in Pond Inlet (see Appendix 1). |
| | | Baffinland to prepare a summary on all vessel-related activity. Maintain comment/concern tracker relevant to shipping season. |
| | Overall shipping season summary | Baffinland to host an End of Shipping Season Meeting with representatives of MHTO, the Hamlet of Pond Inlet and local QIA. Meeting is typically held within the same year of shipping season being discussed after the last Baffinland Project vessel has left the RSA. Baffinland to prepare a summary on all vessel-related activity. |
| Post-season | End of Shipping Season Meeting | Where possible, Baffinland considers the potential for integrating feedback in planning of next shipping season operations, including |

| Timing | Key Component | Description |
|--------|--------------------------------|--|
| | | consideration of adoption of new management and mitigation measures. |
| | End of Shipping Season Meeting | <p>Baffinland to host an End of Shipping Season Meeting with representatives of MHTO, the Hamlet of Pond Inlet and local QIA. Meeting is typically held within the same year of shipping season being discussed after the last Baffinland Project vessel has left the RSA.</p> <p>Where possible, Baffinland incorporates considers the potential for integrating feedback in planning of next subsequent year's shipping operations, including consideration of adoption of new management and mitigation measures.</p> |

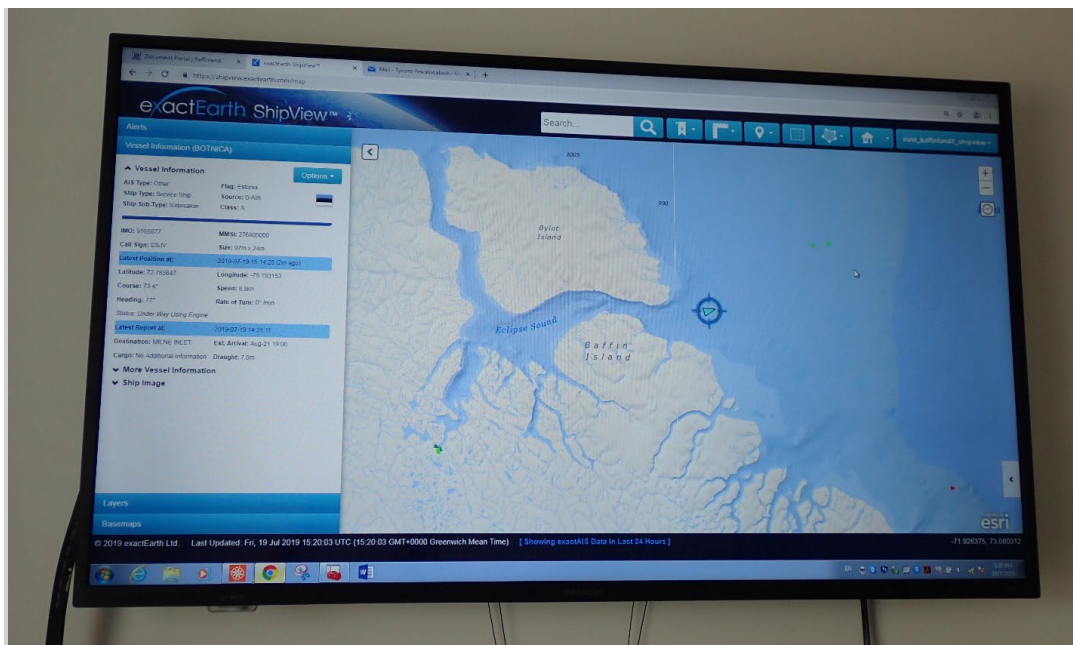


Figure 4.1: Large wall-mounted TV monitor in Baffinland's Shipping Monitor office located on the 2nd floor of the MHTO office building in Pond Inlet showing live ShipView tracking of Baffinland vessels

4.2 SUMMARY OF 2022 IMPLEMENTATION OF BAFFINLAND'S SHIPPING COMMUNICATIONS PROTOCOL

Baffinland's shipping season ended on October 13th, 2022 when all vessels had exited the Regional Study Area. Although Baffinland strives to hold the End of Shipping Season Meeting as soon as it is feasible to do so after the closing of each shipping season, the Company was not able to hold the 2022 End of Shipping Season Meeting until February 8th, 2023. Baffinland made several informal and formal requests between November 2nd, 2022 and January 30th, 2023 through verbal and written methods to obtain potential availabilities of the MHTO board members and to obtain input on agenda items. The 2022 End of Shipping Season meeting was held in person at the Sauniq Hotel in Mittimatalik from 9:00 am – 2:45 pm and included attendees from the MHTO, QIA, the Government of Nunavut, the Hamlet of Pond Inlet, and the public.

The focus of these meetings was to provide representatives with an overview of Baffinland's 2022 shipping season. Concerns noted from representatives were the continued use of Ragged Island for vessel anchorage, ballast water management, the introduction of aquatic invasive species, and the presence of Killer Whales (Orcas). More details about the post-shipping meeting is in Section 4.3.1 (Table 4.2).

4.2.1 2023 PRE-SHIPPING SEASON MEETING

On June 28, 2023, Baffinland representatives met in-person in Pond Inlet with representatives of the MHTO Board and council members for the Hamlet of Pond Inlet. Baffinland's Senior Manager of Environment & Social Governance, Sustainability Specialist and Environmental Engagement Lead also held a radio show on June 27, 2023 to provide updates on plans for the 2023 shipping season and engage in discussions with residents of Pond Inlet.

The following is a brief summary of the key points presented and discussed with residents of Pond Inlet:

- i) Overview of 2023 shipping season;
- ii) A summary of key mitigation measures that will be implemented this year;
- iii) An update regarding communication between the community of Pond Inlet and Baffinland for the upcoming shipping season;
- iv) Baffinland's commitment to no ice-breaking during the 2023 spring shoulder season and waiting until there is a continuous path of 3/10s ice concentration prior to commencing shipping;
- v) Reasoning for not further lowering the vessel speed limit from the current 9 kn, as described in Section 4.3.1, Table 4.2;
- vi) Restrictions imposed on vessels entering the RSA, including the inability to enter unless instructed by the Port Captain;
- vii) Mitigation measures enforced at Ragged Island, including a limit of three anchorage locations, and prohibiting vessel drifting in Eclipse Sound unless warranted due to safety concerns.

Baffinland provided an update on the shipping monitor program focused on hiring, primary duties, and communication with the public. Baffinland staff conveyed that shipping monitors are on duty 24/7 and therefore are available to provide information and answer questions about the vessels around the clock.

Similar to 2022, Baffinland will continue to announce the start of the marine mammal aerial surveys using Facebook and provide responses to certain questions received via Facebook. The commencement of the marine mammal surveys will be announced on public radio and marine VHF radio.

On July 11, 2023 the Manager of the MHTO announced on Facebook's Pond Inlet News page that the floe edge has been closed for the 2023 season. As per the communication protocol, Baffinland will follow-up directly with the MHTO to acknowledge and confirm that the floe edge is closed prior to commencing any shipping activities.

4.3 ENGAGEMENT RELATED TO NARWHAL ADAPTIVE MANAGEMENT RESPONSE PLANS

On April 8 2021, Baffinland provided to the NIRB a Technical Memo prepared by Baffinland's marine mammal monitoring technical consultants, Golder (now referred to as WSP), entitled Preliminary Summary of 2020 Narwhal Monitoring Programs (the Memo) (Golder, 2021; NIRB Registry No. :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 abundance estimate for the Eclipse Sound

narwhal stock. The memo focused on the implementation of mitigation measures to address the observed decline in narwhal stock. There was a comment and response period facilitated by the NIRB following the submission of the memo. Relevant engagement activities and parties that submitted comments are outlined in Baffinland's 2021 NIRB Marine Shipping and Vessel Management Report (Baffinland, 2021a). In addition to NIRB's facilitated exchange of written comments on the Memo in 2021, Baffinland continued to conduct its own engagements with several Parties. Baffinland recognized that the 2021 Marine Mammal Aerial Survey results as reported in WSP (2022a) indicated a further decline in Eclipse Sound narwhal stock even though shipping activity was reduced in 2021 in comparison to 2020, and icebreaking had not occurred.

Given the uncertainty on the causal mechanisms for these observed reductions in narwhal abundance in 2020 and 2021, Baffinland expanded upon existing measures described within the 2022 Narwhal Adaptive Management Response Plan (NAMRP), which was submitted to the NIRB as an appendix to the 2022 Marine Shipping and Vessel Management Report (Baffinland, 2022). The 2022 Marine Mammal Aerial Survey results (WSP, 2023a), which are summarized in Appendix G.6.2 of the 2022 Annual Report to the NIRB (Baffinland, 2023b), indicate that the 2022 narwhal abundance estimate for the Eclipse Sound stock was statistically higher than the 2021 estimate. The 2022 narwhal abundance estimate for the Eclipse Sound stock was 4,592 in 2022, compared to 2,595 in 2021. Given the increase in the Eclipse Sound narwhal stock abundance, Baffinland does not intend to update the NAMRP for the 2023 shipping season and will continue implementing the same mitigation measures that applied in 2022. Baffinland continues to engage with community members and organizations to receive feedback to be incorporated into future amendments, if required. A summary of engagement attempts/engagement opportunities conducted since the release of the 2022 Marine Shipping and Vessel Management Report (Baffinland, 2022) that relate to the NAMRP, inclusive of marine mitigation measures, monitoring, and shipping are as follows:

1. Held a meeting with the MEWG on February 15th, 2023 to provide an update on 2022 convoy operations for ore carriers, summary of preliminary 2022 marine monitoring results and proposed 2023 marine monitoring programs. These meetings took place from 9:00 am – 5:00 pm in-person in both Ottawa and Iqaluit. Members from the five HTOs from the affected communities were present in-person in Iqaluit and virtually linked to the meetings in Ottawa simultaneously. Presentation materials circulated to the MEWG members occurred on February 9th, 2023 in both English and Inuktitut.
2. Provided the MEWG copies of all its 2022 Final Marine Monitoring Reports on May 3rd, 2023.
3. Submitted to the Nunavut Impact Review Board (NIRB) its 2022 Annual Monitoring Report as of May 3rd, 2023, with comments expected back from interested Parties on July 11th, 2023.
4. Baffinland participated in the NIRB's Marine Monitoring and Marine Mitigation Workshop held in-person in Pond Inlet May 24th – 25th, 2023. The focus of this engagement was to provide opportunity for Pond Inlet residents to discuss community-related concerns for project impacts to the marine environment and monitoring activities. Regulatory agencies in attendance were the Department of Fisheries & Oceans Canada (DFO), Transport Canada (TC), and the Canadian Northern Economic Development Agency's Northern Projects Management Office (CANNOR – NPMO). Representatives of the QIA also attended to receive and respond to community feedback and understand the issues of priority for the community with respect to the marine environment.
5. On May 26th, 2023, Baffinland met with members of the MHTO to discuss an in-person meeting date for the Pre-Shipping Season meeting. MHTO indicated they would be available the week of June 26th, 2023. This meeting was for June 28th, 2023.

6. Baffinland's Sr. Manager of Environment & Social Governance, Sustainability Specialist and Environmental Engagement Lead flew to Pond Inlet on June 26th, 2023 to meet with community members, representatives of the MHTO, council members of Hamlet of Pond Inlet, and deliver initial training for the Pond Inlet Community-based Shipping Monitors.
7. On June 27th, 2023, Baffinland held a radio call-in show to provide updates to the community on its 2023 shipping season with a question and answer period.
8. On June 28th, 2023, Baffinland's Sr. Manager of Environment & Social Governance, Sustainability Specialist and Environmental Engagement Lead met in-person with representatives of the MHTO, members of the Hamlet Council to deliver a presentation on plans for the 2023 shipping and subsequent mitigation measures.
9. On June 29th, 2023, Baffinland met with the Chair of the MHTO in-person to discuss potential participation of a MHTO participant for Leg 2 of the 2023 Marine Aerial Survey Program. A request for a letter of support from the MHTO for WSP's marine monitoring work & initial discussion of support from the MHTO for a proposed Narwhal Cortisol Sampling Program, and a potential in-person meeting in August 2023 to discuss participation in a workshop for the Milne Inlet Fish Health Program was also discussed at this time.
10. On July 12th, 2023, Baffinland held a MEWG meeting to provide and operations update for the 2023 shipping season, as well as an overview of confirmed marine monitoring programs. A question and answer period covering the 2023 shipping season, marine monitoring programs, and the 2022 annual monitoring reports was included in the agenda, but time restrictions prevented all topics from being covered. Members were told that outstanding questions could be provided to Baffinland in writing.

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 from July 2022 – July 2023

| Summary of Comment/ Recommendation | Baffinland Response / Outcomes |
|---|---|
| Recommendations from MHTO to further reduce shipping | <ul style="list-style-type: none"> • Baffinland will opportunistically implement convoys throughout the 2023 shipping season to reduce the total number of vessel transits within the RSA. Additional details pertaining to convoys are included in Appendix F the draft 2023 SMWMP (Baffinland, 2023a). • Baffinland has committed to allowing no more than 84 ore carriers enter the RSA if approved to ship 6.0+ Mtpa in 2023. |
| Recommendations from MHTO and the community of Pond Inlet to discontinue the use of acoustic monitors in the RSA | <ul style="list-style-type: none"> • Baffinland intends to deploy two acoustic recorders in July of 2023 to ensure there are no data gaps related to the use of larger ore carriers. • Baffinland will retrieve the two acoustic recorders in October, 2023. If the second contingency icebreaker is active, Baffinland will re-deploy the acoustic monitors after downloading the data to overwinter and capture dual icebreaker transits at the end of the 2023 shipping season. • Baffinland discussed the use of acoustic recorders at the 2023 Pre-shipping Meeting held in Pond Inlet on June 28th, 2023 with representatives from the Hamlet of Pond Inlet and the MHTO. No objections or concerns were raised relating to the deployment of acoustic recorders in 2023. |
| Recommendations from Hamlet of Pond Inlet, Parks Canada, DFO and QIA on enhancements to Baffinland's existing and proposed monitoring programs. | <p>Baffinland has committed to working with these Parties on further refinements of these programs (i.e., analysis of Early Warning Indicator [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. Baffinland attempted to implement a narwhal tagging program for the 2022 shipping season, but did not receive support from the MHTO to proceed. For the upcoming 2023 shipping season, the DFO will be conducting aerial surveys to provide updated abundance estimates for regional narwhal stocks. Baffinland will continue to conduct marine mammal aerial surveys within the RSA throughout the 2023 shipping season, and has extended an invitation to MHTO to participate. Baffinland has purchased higher resolution cameras for the 2023 MMASP, which will allow DFO to identify individual narwhals using the software WhaleSeeker, should DFO wish to collaborate on the aerial survey monitoring. This helps address community concerns related to whether narwhals are being double-counted, and eliminates observer bias, fatigue, and human error. Additionally, Baffinland is expanding its Aquatic Invasive Species/Non-Indigenous Species (AIS/NIS) monitoring program in 2023 to include a 2-week biological</p> |

| Summary of Comment/ Recommendation | Baffinland Response / Outcomes |
|--|--|
| | ballast water sampling pilot program conducted by DFO with support from BIM. |
| Recommendations from the MHTO to include an MHTO representative on the marine mammal aerial surveys. | <p>Baffinland engaged with MHTO on July 6 and 11th, 2022 to request MHTO participation in Leg 2 of the 2022 Marine Mammal Aerial Survey, occurring August 9th to August 23rd, 2022. Baffinland did not receive confirmation from MHTO that a board member would participate.</p> <p>Baffinland met with the MHTO on May 26th and June 28th, 2023 to inquire about MHTO participation on Leg 2 of the 2023 MMASP. The MHTO verbally confirmed that they would send a representative, however, screening requirements for site deployment are still underway and participation is not secured. Baffinland will continue to correspond with MHTO regarding participation in future aerial studies.</p> |
| Recommendations from DFO that Baffinland develop a more robust zooplankton monitoring program. | Baffinland's 2022 zooplankton monitoring program involved both the use of settlement plates and vessel-based net tows. DFO offered to provide Baffinland a more robust methodology. DFO met with Baffinland and WSP representatives on April 20 th , 2023 to discuss the 2023 proposed zooplankton study design. DFO provided multiple recommendations, all of which were subsequently incorporated into the 2023 study design, with the exception of a single recommendation that presented logistical constraints that deemed it infeasible for this field season. Modifications to the zooplankton monitoring program include: an increase in the number of sampling sites, and an increase in the number of sampling events to allow for more temporal variability. |
| Multiple organizations from the MEWG recommended that the comment and response system for monitoring reports be revised to correspond with Annual Report dates. | Baffinland revised its annual reporting process in 2023 so marine monitoring reports are submitted as final in tandem with the NIRB Annual Report. The final 2022 marine monitoring reports were appendices in the 2022 NIRB Annual Report (Baffinland, 2023b), which was submitted on April 30 th , 2023. |
| Various MEWG members had concerns related to convoys, including whether these convoys will minimize noise, what the maximum number of vessels per convoy will be, and what the approximate percentage of vessels travelling in convoy will be. | A Convoy Operational Guide is included in Appendix F of the draft 2023 SMWMP (Baffinland, 2023a). Additional details pertaining to acoustic monitoring results for convoys conducted throughout the 2022 season can be found in the Preliminary Analysis of Noise From Vessel Convoys Report and the 2022 Underwater Acoustic Monitoring Program (Open-Water Season) Report; Appendix G.6.5 and G.6.6 of the 2022 NIRB Annual Report, respectively (2023b). The 2022 annual monitoring reports were available for public comment until July 11 th , 2023. Concerns related to the use of vessel convoys and acoustic monitoring results included in intervener responses will be addressed by Baffinland within 30 days of receipt. |

5 MITIGATIONS FOR MARINE MAMMALS AND TRADITIONAL HARVESTING

5.1 ADAPTIVE MANAGEMENT MEASURES FOR 2023

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 2023, Baffinland is committed to taking a precautionary approach and adding additional mitigations to its shipping activities in 2023 on an interim basis.

Baffinland will continue to implement all other existing mitigation measures as described in Section 6 of the SMWMP (Baffinland, 2023a) and in Table 5.1 below, including delaying the shipping season until a continuous path of 3/10ths or less ice concentration is available along the Northern Shipping Route. This mitigation measure, introduced in 2021, can delay the start of shipping between 2 and 3 weeks based on historical ice conditions resulting in a significant loss of revenue for the company. This loss was acutely experienced in 2022 when the shipping season was closed on October 13, 2022. Had Baffinland begun shipping activities two weeks earlier that year, all ore at the Milne Port pad would have been vacated, instead approximately \$1.3 mt was left.

In addition to the continued implementation of marine mitigation measures from previous years, Baffinland has elected to establish additional mitigation measures for the 2023 shipping season as a precaution. Baffinland will restrict the use of scrubbers within the RSA, and will require vessels at anchorage to rely on auxiliary power unless not advisable for safety reasons.

5.2 SHIPPING MITIGATIONS MEASURES TO REDUCE IMPACTS ON MARINE MAMMALS

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 are communicated to hunters on the water and in the communities through the Shipping Monitors. In all cases, vessels are instructed to avoid Koluktoo Bay and the western shoreline near Bruce Head to minimize effects on marine mammals, sea birds, 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 operate 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 SMWMP (Baffinland, 2023a). Table 5.1 summarizes these mitigations:

Table 5.1: 2023 Mitigation Measures for Marine Mammals

| Project Activity | Mitigation Measure(s) | Species |
|-----------------------------------|---|--|
| Vessel traffic to/from Milne Port | <ul style="list-style-type: none"> Maintain constant speed and course when possible. Reduce vessel speed to 9 knots. Reduce vessel idling. No more than 3 ore carriers anchoring at Ragged Island and/or drifting in Eclipse Sound. Drifting to be avoided unless warranted for safety reasons. | Ringed Seal, Bearded Seal, Walrus, Beluga, Narwhal, Bowhead Whale, Polar Bear, Sea birds |

| Project Activity | Mitigation Measure(s) | Species |
|------------------|--|---------|
| | <ul style="list-style-type: none"> No icebreaking to commence the 2023 shipping season. Ore carriers will not begin their transit to Milne Port until 3/10ths or less ice is present along the entire shipping route through the Nunavut Settlement Area (NSA) from the entrance of Eclipse Sound and Milne Port. No breaking of landfast ice will occur. 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, polar bear, or large aggregations of sea birds 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. No more than 84 ore carriers will be chartered during the shipping season, pending approval of the Sustaining Operations Proposal (SOP). This is two (2) ore carriers less than the maximum anticipated and approved in the previous Production Increase Proposal (PIP) and Extension (PIPE) requests, but up to four (4) more ore carriers than the maximum anticipated in and approved in the Production Increase Proposal Renewal (PIPR) request. The use of capesize vessels may allow for fewer transits to reach targeted shipments, resulting in a shorter duration of sound exposure within the RSA. Use of convoys throughout the 2023 season to further reduce total sound exposure. Acoustic monitoring data indicates that if ore carriers transit in convoys with inter-vessel separation less than 10 km, there is an overall reduction of the total sound exposure in the Regional Study Area compared to multiple individual transits of an equivalent number of vessels. Slight increases of instantaneous sound levels in the regions between the vessels are compensated for by shorter exposure duration, | |

| Project Activity | Mitigation Measure(s) | Species |
|------------------|---|---------|
| | <p>resulting in a net decrease of noise exposure (see Appendix F in Baffinland, 2023a).</p> <ul style="list-style-type: none"> Continued implementation of established “no-go zones” along the western shore of Milne Inlet and Koluktoo Bay. Limiting the number of vessels anchored or drifting at Ragged Island to a maximum of three vessels at any time throughout the shipping season, unless there is a need for safety reasons. Continued restriction of drifting within Eclipse Sound. 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. Restricting the discharge of grey water by ore carriers or the Botnica anywhere in the RSA; no disposal of waste overboard. 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 5.1). Restricting the use of scrubbers within the RSA. Instructing vessels to power off main engines and rely on auxiliary power at anchorage, unless warranted for safety purposes. | |

All vessels ranging in size from Capesize to Newcastlemax will be collectively referred to as Capesize*, equivalent to vessel sizes of Deadweight Tonnage (DWT) range of 200,000 – 220,000, and carrying capacity range of approximately 200,000 to 215,000 metric tonnes.

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
- Submitting advanced notice to the MHTO and Hamlet 72 hours & 24 hours in advance of the first anticipated inbound vessels.
- Development of an extensive Internal Communications Shipping Protocol for Shipping Activities (Baffinland, 2021b), that includes the hiring of a **minimum** of four full-time shipping monitors within Pond Inlet who provide community updates on vessel traffic both over community radio and VHF throughout the shipping season.
- Development of a Baffinland Shipping Facebook page to address community concerns related to shipping.

- Weekly sharing of an anticipated approximate 10-day rolling schedule with the MHTO and Hamlet to ensure hunters and community members are aware of transiting vessels.

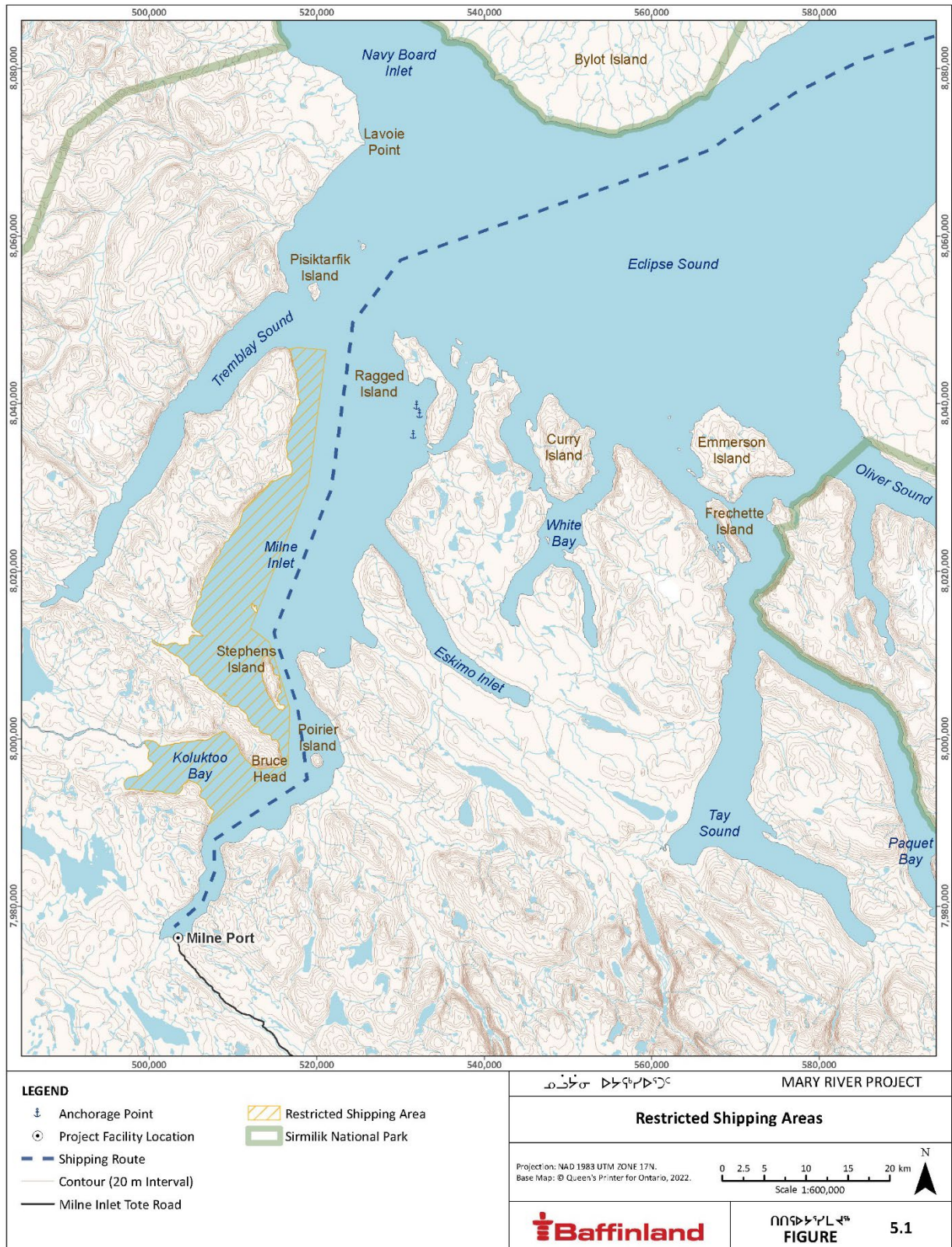


Figure 5.1: Nominal Shipping Route and Restricted Shipping Areas

- 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).
- 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 AND 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 (PIPE) 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 Mary River Project 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 Production Increase Proposal (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 after three amortization years of use (IIBA 17.9, 2018), and

- The Wildlife Monitoring Program which provides \$200,000 annually to the MHTO to conduct community based research based on a scope and design established by the community and the MHTO, and subsequent approval by the Joint Executive Committee (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, Baffinland, the MHTO, and the Hamlet of Pond Inlet signed the “Agreement to Establish the Pond Inlet Committee”¹ in response to concerns raised during former engagements related to the Production Increase Proposal (PIP). 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 to the Tasiuqtiit Working Group (TWG), managed by the MHTO and Hamlet of Pond Inlet, for every ore carrier required to ship in excess of 4.2 Mtpa. Since its signing, this Agreement has led to the direct disbursement of \$800,000 to the community of Pond Inlet (\$130,000, \$240,000, \$170,000, \$190,000, and \$70,000 for years 2018, 2019, 2020, 2021, and 2022, respectively). Baffinland has also committed to providing funding of up to \$50,000 towards a TWG Fund Administrator position for this group to support the functioning and disbursement of funds for up to 3 years, though at this time, the position remains unfilled. While Baffinland is currently only approved to ship 4.2 million tonnes, this agreement will be reinstated should the Project be approved to ship above 4.2 Mtpa.

¹ This agreement led to the creation of Tasiuqtiit Working Group (TWG).

6 MONITORING PROGRAM REVIEW

6.1 MARINE MONITORING PROGRAM ENGAGEMENT ACTIVITIES

Section 4 summarizes Baffinland's 2023 engagement activities with the community of Pond Inlet and other Parties, including the MEWG. Five notable outcomes resulted from these engagement activities:

1. MHTO sought approval to participate in the MMASP on June 29, 2022 as part of a MEWG meeting. Baffinland committed to providing an opportunity for MHTO to participate in future aerial surveys and secured a position on Leg 2 of the 2023 MMASP for a MHTO member. This participation is tentative pending approval for site deployment. Should MHTO be unable to participate, Baffinland will seek participation from the Ikajutit Hunters and Trappers Association for participation in Leg 2 or Leg 3 aerial surveys.
2. Baffinland respects the MHTO's proposal to have all organizations suspend the deployment or remove any recording devices from Eclipse Sound and Milne Inlet in the same season on a trial basis, and is committed to work with the MHTO and other organizations to coordinate such an undertaking. In the interim, Baffinland must meet its monitoring obligations as outlined in Project Certificate 005, which requires monitoring of the acoustic environment, especially where data gaps have been identified and can be addressed.
3. Baffinland did not propose a narwhal tagging program for 2023 due to a lack of support for the program in 2022. At the February 2023 MEWG meeting, the MHTO indicated program support if led by the DFO. Baffinland remains open to collaborating with both the MHTO and DFO to execute a narwhal tagging program in future years.
4. Baffinland purchased three, higher resolution cameras for the 2023 MMASP that will allow for the photographic identification of individual marine mammals. This analysis maybe completed by the DFO. Baffinland will be conducting aerial surveys within the RSA throughout the 2023 shipping season, while DFO will be conducting regional surveys.
5. Baffinland recognizes concerns from community and MEWG members regarding cortisol levels in narwhal. Baffinland supports the sampling of cortisol in narwhal and is actively working to engage the MHTO in providing study design input for a future sampling program.

More generally, historical engagement with the MHTO and the MEWG throughout 2022 and 2023 also resulted in the following key changes to the 2023 marine monitoring programs:

1. The 2023 zooplankton study design for the Marine Environmental Effects Monitoring Program (MEEMP) program was revised to incorporate feedback from the DFO. This included adding additional monitoring stations and an additional sampling event, for a total of 6 monitoring stations and 3 sampling events, to increase spatial and temporal variability.
2. Elimination of the proposed floe-edge narwhal tagging program for the 2022 season.
3. A third year of morphometric data collection of body condition via the drone program at Bruce Head in summer 2023.
4. Delineation of the propeller wash scour adjacent to SW-02 where changes in sediment grain size have been observed.
5. Addition of 12 quadrats for benthic epifauna and epiflora monitoring as per the MEEMP.

6. Baffinland marine consultants, WSP, will continue attempts to establish a suitable reference area for the fish health program (component of the MEEMP) in 2023.
7. Continued participation in the Marine Mammal Observation Network (MMON) to ensure that marine mammal distribution, occurrence, relative abundance and behavioural responses are captured in the event that ice conditions prevent the completion of the Shipboard Observer Program (SBO).
8. Establishment of the collaborative DFO ballast water biological sampling pilot program, which involves onboard sampling of ballast tanks for ore carriers with treatment systems.

6.2 2023 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 2023 shipping season. These programs 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 2023 Marine Mammal Monitoring Programs

| Program | Basic Description | 2023 Follow-up Monitoring Priorities/ Considerations |
|--|--|---|
| Bruce Head Shore-Based Monitoring Program (Visual) | <p>Visual Observations:</p> <ul style="list-style-type: none"> • Relative Abundance and Distribution (RAD) • Group Composition and Behaviour • Human Activity <ul style="list-style-type: none"> ○ Vessel Traffic ○ Hunting • Weather and Anecdotal Observations <p>Project-related vessels tracked via both satellite and shore-based AIS</p> <p>Estimated Start Date: July 26th</p> <p>Estimated Duration: 4 weeks</p> | <ul style="list-style-type: none"> • 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 impacted based on observations made in 2023, noting that exact causal factor remains unknown since narwhal utilize habitats in the RSA temporarily for only ~up to 4 months per year (i.e., 1/3 of the year), and is dependent on ice conditions. Potential for spatial and temporal interaction with Baffinland shipping activities are therefore limited to the RSA and days over which shipping is occurring. |

| Program | Basic Description | 2023 Follow-up Monitoring Priorities/ Considerations |
|--|--|--|
| Bruce Head Shore-Based Monitoring Program (includes Unmanned Aerial Vehicle [UAV]) | <p>UAV Observations:</p> <ul style="list-style-type: none"> Focal Follows – Northern Shipping Route, Koluktoo Bay <p>Systematic Survey – Stratified Study Area (SSA) Morphometrics – Body Condition</p> <p>Proposed system by InDro Robotics: DJI M300</p> <p>Estimated Start Date: July 26th</p> <p>Estimated Duration: 4 weeks</p> | <ul style="list-style-type: none"> 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 a similar manner to previous years? Collect second year of morphometric data to contribute towards a narwhal body condition monitoring program (base year is 2021). The photogrammetric data collection of narwhal (morphometric baseline data) using UAV will be used 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, noting that narwhal spend only spend up to 1/3 of their year in the RSA with overlapping shipping activities. |
| Marine Mammal Aerial Survey Program (Leg 1) | <ul style="list-style-type: none"> Open-water and floe edge area east of Pond Inlet; Pond Inlet and Baffin Bay strata Line-transect surveys – data recorded by onboard marine mammal observers (MMOs) Transition to photographic surveys when large animal | <ul style="list-style-type: none"> Monitor narwhal relative abundance and distribution in the 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 |

| Program | Basic Description | 2023 Follow-up Monitoring Priorities/ Considerations |
|---|--|---|
| | <p>aggregations encountered (same as 2019-2022 survey design)</p> <p>Estimated Start Date: July 19th</p> <p>Estimated Duration: 14 days</p> | <p>data, which allows for these factors to be considered in the analysis.</p> <ul style="list-style-type: none"> • The 2023 Leg 1 aerial surveys will last two weeks and end one week prior to Leg 2 aerial surveys (separate 2-week survey), which 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), though this benefit will be limited in 2023 given that ore carriers will only enter the RSA once specific ice concentration conditions have been met (i.e., 3/10ths ice concentrations). |
| Marine Mammal Aerial Survey Program (Leg 2) | <ul style="list-style-type: none"> • Same strata as 2016 DFO photographic aerial survey and 2019-2022 BIM aerial survey • Line-transect surveys – data recorded by onboard MMOs • Transition to photographic surveys when large animal aggregations encountered (same as 2019-2022 survey design) <p>Estimated Start Date: August 9th</p> <p>Estimated Duration: 14 days</p> | <ul style="list-style-type: none"> • Updated abundance estimate for the Eclipse Sound and Admiralty Inlet narwhal summer stocks – compare abundance estimates to previous years. • Survey design and data collection methodology previously developed by Fisheries and Oceans Canada (DFO) (Matthews et al. 2017; Marcoux et al. 2016; Doniol-Valcroze et al. 2015; Asselin and Richard 2011; Golder 2020, 2021; WSP, 2022a) will be used for Leg 2 to allow for a comparison to previously reported abundance estimates. |
| Marine Mammal Aerial Survey (Leg 3) | <ul style="list-style-type: none"> • 2-3 days of narwhal clearance flights in RSA at end of shipping | <ul style="list-style-type: none"> • Visual clearance survey to confirm that no narwhal entrapment |

| Program | Basic Description | 2023 Follow-up Monitoring Priorities/ Considerations |
|-------------------------------------|---|--|
| | <p>season – data recorded by onboard MMOs.</p> <ul style="list-style-type: none"> No dedicated or systematic transects. Surveys are flown along the Northern Shipping Route within fjords and in areas where previous entrapment events have been recorded. Transition to photographic surveys when large animal aggregations encountered (same as 2019-2022 survey design) <p>Estimated Start Date: End of 2023 Shipping Season</p> <p>Estimated Duration: 2 days</p> | <p>events have occurred in the RSA following completion of Baffinland’s 2023 shipping operations along the Northern Shipping Route.</p> |
| Passive Acoustic Monitoring Program | <p>Deployment of two recorders near Bruce Head and Ragged Island late July early August.</p> <ul style="list-style-type: none"> Will record marine mammals, as well as shipping and tourism activities throughout the shipping season. Will record until early October 2023 to capture potential cape-sized vessels. Acoustic recorders will be retrieved in October, 2023 to download the acoustic monitoring data to ensure that results can be shared in the 2023 annual monitoring reports. the recorders will be re-deployed following the data download in October 2023. The recorders will overwinter to capture potential dual icebreaker transits at the end of the shipping season. If overwintering, recorders will record until July, 2024 to capture the initial inbound vessels for the 2024 shipping season. | <ul style="list-style-type: none"> Measure and characterize ambient noise levels along the Northern Shipping Route – compare the data to previous years. Acoustically monitor for marine mammal presence, notably narwhal, along the shipping corridor – document spatial and temporal variability in the RSA. Evaluate underwater noise levels from Project shipping and 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 to estimated (modelled) sound levels. Evaluate vessel noise signatures and potential changes in narwhal |

| Program | Basic Description | 2023 Follow-up Monitoring Priorities/ Considerations |
|-----------------------------------|---|--|
| | <p>Estimated Start Date: July 19th, 2023</p> <p>Estimated Duration: Either 3 or 12 months</p> | vocal behaviour in relation to shipping. |
| Ship-Board Observer (SBO) Program | <ul style="list-style-type: none"> Marine wildlife observers (MWOs) will record systematic marine mammal and seabird observations from the enclosed bridge of the MSV Botnica. Surveys will be conducted throughout Milne Inlet and Eclipse Sound along the Northern Shipping Route. In addition to MWO watch periods, the WSP biologists will perform dedicated seabird surveys throughout the daily watch schedule, which will be conducted in accordance with the Canadian Wildlife Service (CWS) Eastern Canadian Seabirds at Sea (ECSAS). <p>Estimated Start Date: October 10th, 2023</p> <p>Estimated Duration: 14 days</p> | <ul style="list-style-type: none"> Estimate relative representation of species Assess presence, relative abundance, distribution, and behavioural response of narwhal (<i>Monodon monoceros</i>) and other marine mammals to vessel traffic and associated activity during the 2023 shipping fall shoulder season. Compare abundance estimates to previous years (last SBO program completed in 2019) |



Figure 6.1: 2022 Bruce Head Shore-Based Program Field Researchers Conducting Visual Observations



Figure 6.2: Still Frame Taken During Focal Follow Survey Showing Group of Narwhal of Mixed Age and Sex on 17 August, 2022 (10:30)

6.3 INUIT PARTICIPATION AND COMMUNITY BASED MONITORING

6.3.1 Inuit Participation in Marine Monitoring Programs

The integration of local Inuit knowledge in field program design is essential for all environmental monitoring programs to be successful. As part of this task, WSP (Baffinland's marine consultants) and Baffinland aim to engage with the Mittimatalik Hunters and Trappers Organization (MHTO) prior to commencing all programs to receive input on the program components. Prior to all field work, WSP will request a Letter of Approval from the MHTO in order for the programs to proceed following receipt of the approval. The letter seeking approval was sent and hard copies provided to the MHTO, and approval was provided in writing on July 5th, 2023. WSP includes Inuit participants in field monitoring programs to ensure that Inuit Qaujimajatuqangit is incorporated. Inuit participation for the 2023 monitoring programs is as follows:

- Marine Mammal Aerial Survey (Leg 1) – 2 participants
- Marine Mammal Aerial Survey (Leg 2) – 2 participants (tentatively a 3rd participant from MHTO—to be confirmed)
- Marine Mammal Aerial Survey (Leg 3) – tentatively 2 participants. Logistics for this program are still being finalized at the time of this report and Inuit representation may change.
- Bruce Head Shore-based Monitoring Program (visual and UAV) – 10 participants, 5 of which are Baffinland and Qikiqtani Inuit Association (QIA) employees.
- Passive Acoustic Monitoring Program – 0 participants, as this is a limited-scope program that only requires 2 participants
- Ship-based Observer Program (SBO) – 1 participant. Logistics for this program are still being finalized at the time of this report and Inuit representation may increase.

In addition, Baffinland has expanded its community-based shipping team in Pond Inlet to include eleven shipping monitors for the upcoming 2023 season. These shipping monitors are based out of the MHTO office building and act as a liaison between community members, hunters, and Baffinland. A community-based Environmental Coordinator was hired in November 2021 to provide a community-based contact in Pond Inlet for residents to engage directly with Baffinland on any environmental matters. This position remains filled and the Pond Inlet Environmental Coordinator continues to be involved in Marine and Terrestrial Working Group Meetings, community engagements, and marine monitoring programs.

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. 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) (JEC) for review and approval.

7 AQUATIC INVASIVE SPECIES / NON-INDIGENOUS SPECIES MONITORING

7.1 2022 AQUATIC INVASIVE SPECIES / NON-INDIGENOUS SPECIES MONITORING PROGRAM RESULTS

All specimens caught or observed during biological surveys conducted for the 2022 monitoring program (including benthic infaunal samples from twelve stations, benthic epifauna and macroalgae from 26 quadrats and opportunistic incidental sampling conducted during SCUBA surveys of the quadrats, six zooplankton samples, flora and fauna from 31 settlement plates and 21 settlement baskets, fish collected by Fukui trap, hoop net, gillnet, angling and trawling, and analysis of fish gut contents) were compared against the existing taxonomic inventory for Milne Inlet to detect potential non-indigenous species (NIS) or aquatic invasive species (AIS).

To date, the taxonomic inventory for Milne Inlet consists of approximately 880 taxa detected by Baffinland's monitoring programs. Nine of the 362 unique taxa detected in 2022 had not been seen in previous surveys of Milne Inlet, but were reported elsewhere in the Canadian Arctic.

The newly recorded taxa included: two fish species, Half-barred Pout (*Gymnalus hemifasciatus*) and Spatulate Sculpin (*Icelus spatula*); a parasitic worm in the class Cestoda, found in a fish stomach; the tunicate *Halicynthia pyriformis*; the anemone *Stomopsis* sp.; the bivalve *Musculus glacialis*, the snail *Margarites groenlandicus umbilicalis*; as well as the polychaete worm *Myrianida* sp. Two species on the watch list were collected during the 2022 MEEMP—*Hesperonoe* sp., which was first recorded in Milne Inlet in 2020 and was collected again in 2022; and *Marenzelleria* sp., which was identified at two stations in 2022. *Hesperonoe* sp. was placed on the watch list as it is a poorly described species with limited geographic data. *Marenzelleria* sp. was placed on the watch list due to the globally high risk of invasion of the species *Marenzelleria viridis*, however, this species has not been detected at Milne Inlet.

The *Marenzelleria* specimens collected in 2022 lacked the features required to identify them to species, but to date the only two *Marenzelleria* species confirmed to be present in Milne Inlet are Arctic species which are not considered to be high risk species. Collections in 2022 also included a bryozoan from the superfamily Buguloidea, a group which includes species previously identified in Milne Port with confirmed natural ranges in the Eastern Canadian Arctic, as well as the species of concern *Tricellaria inopinata*. It is likely that the Buguloidea specimens from Milne Inlet represent a Canadian Arctic species, however specimens have been sent to Laval University for independent review, consistent with the DFO recommended protocol, and results will be shared with the MEWG once received. Appendix 8A-1 of the Final 2022 Marine Environmental Effects Monitoring Program (MEEMP) Report (WSP, 2023b) shows a complete list of identified taxa. The number of collected specimens and the respective sampling locations are listed in Figure 8-2 and Table 8.1 of the Final 2022 MEEMP report (WSP, 2023b). The finalized report is publicly available on the NIRB Registry and MEWG members had until July 11th, 2023 to provide comments on the report. Upon release of comment feedback, Baffinland will have 30 days to respond in writing. These responses will be shared with the MEWG and additional follow-up will occur if required.

7.2 2023 AQUATIC INVASIVE SPECIES / NON-INDIGENOUS SPECIES MITIGATION AND MONITORING

In 2023, 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 (Baffinland, 2019) in 2023, 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 2023 through marine sediment quality and benthic infauna sampling, as per the

MEEMP. Additionally, Baffinland will be collaborating with the DFO to conduct a two week pilot program involving the biological sampling of ballast water onboard vessels with treatment systems. This program will also involve engagement with Pond Inlet community members to provide hands-on experience, training, and share preliminary findings.

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