WWF-Canada

30 Metcalfe Street
Suite 400
Ottawa, Ontario
Canada K1P 5L4

Tel: (613) 232-8706
Fax: (613) 232-4181
wwf.ca

October 18th, 2013

Mr. Ryan Barry
Executive Director
Nunavut Impacts Review Board

Sent electronically: info@nirb.ca

Re: Mary River Project Certificate for Baffinland Iron Mines Corp.'s Early Revenue Phase Proposal (NIRB File No. 08MN053)

Dear Mr. Barry,

Please find attached WWF-Canada's written submission to the Nunavut Impact Review Board with respect to the Early Revenue Phase of Baffinland's Mary River Iron Ore Mines project.

WWF is not requesting intervenor standing at the technical review, but will be in attendance at the public hearing in Iqaluit, and we are available at any time to respond to any questions which the Nunavut Impact Review Board or the Proponent may have concerning the issues raised by WWF in this submission.

If you have any questions concerning our submission please contact me by telephone at 613-232-2510, or at mvonmirbach@wwfcanada.org.

Yours sincerely,

Martin von Mirbach
Director, Arctic Program
WWF-Canada

cc: Erik Madsen, Baffinland Iron Ore Mines
Oliver Curran, Baffinland Iron Ore Mines

Mary River Project Certificate for Baffinland Iron Mines Corp.'s Early Revenue Phase proposal
(NIRB File No. 08MN053)

Submission by World Wildlife Fund (WWF) to Nunavut Impacts Review Board
October 18, 2013

1. Executive Summary

WWF is an international conservation organization that was established in 1961. Our mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature by conserving the world's biodiversity, ensuring that the use of natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption. We've supported research and field projects in the Canadian Arctic since 1972, and have offices in both Iqaluit and Inuvik.

We recognize the importance of wildlife to Inuit, including the sustainable harvest of marine mammals. Maintaining viable populations of these mammals – including narwhal, polar bear and beluga – is a key priority for WWF, as it is for Inuit hunters and communities that depend on these species for food and income. We've stood shoulder-to-shoulder with Inuit and territorial representatives in opposing the uplisting of polar bears at CITES. We're working in Arviat and other communities across Nunavut to help reduce conflicts between polar bears and people.

We recognize that our conservation objectives in Nunavut must be met in a way that allows for community well-being to be enhanced through sustainable development, including environmentally and socially responsible mining projects. In our intervention at the NIRB hearings in Iqaluit in July 2012 we noted that this project, if well planned and implemented, could set a benchmark for sustainable Arctic development, and provide significant benefits to Nunavummiut. We acknowledge the work that was done by NIRB during the original project review, in considering the diverse input from many sources. NIRB is to be commended for its diligence in approving the project subject to a comprehensive but reasonable set of project-specific Terms and Conditions.

The Early Revenue Phase addendum represents a significant change to the project as originally reviewed and approved. It will provide for a sharp increase of shipping traffic through Milne Inlet and Eclipse Sound throughout the summer, open-water season, directly through the summer concentration areas of a significant percentage of the world's narwhal population. This area is within the Study Area of the proposed Lancaster Sound National Marine Conservation Area, which when established will represent a major step for Inuit and Canada in protecting important marine ecosystems. Furthermore, the importance of this region has recently been recognized internationally by the Arctic Council, as an Ecologically and Biologically Significant Area.

The proposed Early Revenue Phase will bring significant risks and impacts, including several noteworthy impacts that are particular to the newly proposed activities outlined in the Early Revenue Phase Addendum to the Final Environmental Impact Statement (ERP FEIS Addendum).

Displacement of narwhal due to vessel activity. Narwhal are highly sensitive to ship traffic and noise, and are known to change their vocalizations and move away from ship noise at distances of up to 30-50 km. This consumes energy and can consequently affect the health of narwhal, especially when it disrupts their feeding activity and exposes them to higher risk of predation from killer whales. The area is a major nursery for thousands of narwhal, and narwhal of all ages and sex classes depend on this area throughout the summer months. Furthermore, ship transits through Milne Inlet are projected to average 1.6 vessel transits daily during the open-water summer season, and there is no evidence that narwhal can adapt to such frequent vessel traffic. In all likelihood there will be large-scale displacement of narwhal from Milne Inlet (including Koluktoo Bay), and possibly some areas of Eclipse Sound.

Noise affecting narwhal communications. Narwhal are dependent on communications through vocalization in ways that are only partially understood. Available evidence suggests that ship noise (especially in a relatively narrow fiord like Milne Inlet) is likely to mask or reduce the ability of narwhals to communicate effectively with each other, and to detect other sounds such as from predators like the killer whale.

Other pressures on narwhal. Narwhals are particularly vulnerable to climate change, especially sea ice decline and related consequences. Declining sea ice is enabling killer whales to move into the region in growing numbers, very likely with increasing rates of predation on narwhal. It is widely thought that narwhals seek refuge from such predation by moving away from open water conditions, and into more convoluted coastlines and long fiords in this region. The increased ship traffic will make Milne Inlet less available to narwhal for this purpose.

Risks of an oil spill in Milne Inlet or Eclipse Sound. Oil spills pose a hazard everywhere in the Arctic, but the impact of a spill is likely to be especially severe if it were to occur within the highly sensitive and vulnerable waters of Milne Inlet or Eclipse Sound, within the study area of the Lancaster Sound National Marine Conservation Area.

In light of these concerns, WWF offers several recommendations, building on the Terms and Conditions already issued by NIRB for the original project. Those recommendations can be summarized as follows:

- The original Terms and Conditions for the project should be reviewed to ensure that appropriate baseline data gathering, monitoring and mitigation measures are in place for the waters of Milne Inlet and Eclipse Sound.
- There should be a more robust and explicit adaptive management framework, ensuring that monitoring data is promptly reviewed by the Marine Environment Working Group and results in measures and corrective actions that are enacted in a timely fashion by the Proponent and/or by NIRB.
- Ships carrying ore through Milne Inlet and Eclipse Sound should be fit for purpose and avoid using or carrying Heavy Fuel Oil.
- The Early Revenue Phase provision for shipping ore through Milne Inlet and Eclipse Sound should be restricted to eight years, with a formal review required for any extension beyond this period.

WWF Submission: Mary River Early Revenue Phase proposal

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2. Introduction

WWF is an international conservation organization that was established in 1961. Our mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature by conserving the world's biodiversity, ensuring that the use of natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption. We've supported research and field projects in the Canadian Arctic since 1972, and have offices in both Iqaluit and Inuvik.

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3. Specific Comments

3.1 Change in geographical area of activity

Importance of the issue

The ERP FEIS Addendum proposes a significant geographical change in the shipping activity to service this project, with sharply increased shipping traffic in Milne Inlet, Eclipse Sound and Baffin Bay. As a result, many of the Terms and Conditions attached to the NIRB Final Hearing Report for the Mary River Project will need to be revised to be effective in the new environmental context of the activities proposed under the Early Revenue Phase (ERP). In particular, the activities aimed at gathering baseline data, monitoring wildlife activity, monitoring project impacts and implementing adaptive management measures all need to be reconsidered in light of the geographic shift of the project.

References

The following Terms and Conditions from the NIRB Final Hearing Report for the Mary River Project are region and location specific and need to be reviewed in light of the proposed increased shipping activity through Milne Inlet and Eclipse Sound:

1.	Climate monitoring
7.	Air quality monitoring
8/9.	Greenhouse Gas Emissions Monitoring
83.	Shoreline effects and sediment redistribution
86/87.	Ballast water management
94-97.	Spill prevention
99/100.	Supplementary baseline assessments
101.	Marine monitoring
104/105.	Traffic log and shipping information
109.	Ship noise monitoring
176.	Revised spill modeling

181. Precautionary Principle

WWF comments
WWF assumes that the activities proposed in the ERP FEIS Addendum are subject to all of the Terms and Conditions set forth in the NIRB Final Hearing Report for the Mary River Project because this is not a new project but a modification to an existing approved project. However, the above-noted Terms and Conditions refer to specific geographical locations (e.g. Steensby Inlet, Hudson Strait, Igloolik), and therefore may not adequately address environmental impacts that arise as a result of the activities proposed in the ERP FEIS Addendum (affecting Milne Inlet, Eclipse Sound and Pond Inlet).

Recommendations
- The Terms and Conditions from the NIRB Final Hearing Report for the Mary River Project that specifically reference particular geographic regions and locations should be reviewed and re-considered for their application in new regions of activity under the Early Revenue Phase. At a minimum, the following Terms and Conditions should be reviewed: 1, 7, 8, 9, 83, 86, 87, 94, 95, 96, 97, 99, 100, 101, 104, 105, 109, 176 and 181.

3.2 Impacts of ship noise on marine mammals

Importance of the issue
Noise, including from ships, is known to affect marine mammals in a number of ways. Two of the main ones are acoustic masking and displacement from preferred habitats. Acoustic masking occurs when ship noise makes it more difficult for whales to communicate with each other or detect noise from potential predators and other threatening sources. Displacement occurs when marine animals are forced to change their behaviour and distribution to avoid ships and ship noise. These impacts need to be reconsidered in light of the Early Revenue Phase proposal because of three factors: the globally significant high densities of narwhal in Milne Inlet and Eclipse Sound; the concentration of shipping activity during the summer season when thousands of narwhal are using these habitats; and the relative narrowness of these bodies of water.

WWF comments
The large increase in shipping activity through Milne Inlet and Eclipse Sound proposed in the ERP FEIS Addendum would present highly significant challenges for marine organisms, especially marine mammals utilizing these areas. Large numbers of narwhal will likely be displaced from their natural summering habitat by escalated shipping activity, especially in Milne Inlet.

Currently and historically, relatively low levels of vessel traffic occur each year in Nunavut waters, compared to other parts of the world (AMSA 2009). The area directly impacted by this proposed activity (Milne Inlet and Eclipse Sound) is currently one of the three or four main areas supporting the bulk of the world's summering population of narwhal (Richard et al. 2010; Reeves et al. in press). Narwhal are one of the Arctic marine mammal species most vulnerable to the impacts of rapid climate change, especially due to their strong dependence on areas of heavy sea-ice cover (Laidre et al. 2008). Further, winter feeding concentrations and migration corridors to the North Baffin fiords occur in close proximity to routes proposed for increases in

vessel traffic associated with the proposed project (see Dietz et al.2008). The available literature suggests that narwhal are naïve to such anthropogenic sources of noise (e.g., see Finley et al. 1990; Cosens & Dueck 1993), and there is no evidence that narwhal will return quickly to areas transited by vessels.

There is considerable literature regarding the effects of anthropogenic noise and marine mammals, including bowhead whales, toothed whales and other cetaceans (Richardson et al. 1995; Hildebrand, 2005; Wright & Highfill 2007; U.S. Marine Mammal Commission, MMC, 2007; Nowacek et al., 2007; Southall et al. 2007; Weilgart 2007). Although the ERP FEIS Addendum provides indications of some considerable bowhead whale use of Milne Inlet and Eclipse Sound at times, here we focus our comments on the globally-significant narwhal population using these areas.

Regarding the masking of narwhal communications

The Proponent notes (citing Marcoux et al. 2011 and others) that narwhal whistles range from 300 Hz – 10 kHz, pulsed sounds (clicks) are generally in the 12-20kHz range and echolocation clicks can be up to 100 kHz. These frequencies are generally far higher than the frequencies caused by passing ships. However, the Proponent does acknowledge that "*there is some overlap in frequency between shipping sounds and narwhal communications; therefore there is a potential for masking, out to an unknown distance from the vessel(s).*" As well, the Proponent goes on to acknowledge that "*in enclosed areas with shipping noise… masking of narwhal communication could occur during the open-water season…*" (FEIS Addendum, Vol. 8 - Marine Environment, s. 5.9.2.4, p.104). We are not aware of evidence that would support the Proponent's further conclusions that "*if masking does occur this effect would be quite localized*", or that "*if masking does occur, narwhals like belugas, may change their call types and frequencies during noise exposure in order to overcome the masking*". There is no solid basis upon which to draw such conclusions and the Proponent's assessment of "*no significant effect*". It is at least as plausible that there may well be significant masking of narwhal acoustic functions by multiple vessel transits daily through Milne Inlet and Eclipse Sound. Impairment of narwhal ability to hear killer whale calls at substantial distances may well add further to reductions in survival rates for narwhal in this region, beyond displacement from long fiord habitats like Milne Inlet.

Regarding the displacement of narwhals due to ship traffic

The ERP FEIS Addendum Volume 8, Marine Environment, s. 5.9.2.2 (Disturbance) deals with the interaction between proposed activities (construction and vessel traffic) and narwhal (based on transits of project-related ships, and some before-and-after vessel transit aerial transect surveys). Based on the Proponent's information supplied for 2007 and 2008 surveys in the FEIS (Appendix 8A-2 Table 4.4 and Table 4.5), in the ERP FEIS Addendum (page 100) they conclude:

- For 2007: … "*there was no evidence that narwhals immediately abandoned an area transited by a vessel*".

- For 2008: …. "*Relative to density estimates obtained prior to a vessel transit, declines were observed for 10 of 18 vessel transit-area combinations in Eclipse Sound, Koluktoo Bay, and Milne Inlet. Densities before and after vessel transits were similar for about one-third of*

> *vessel transit-area combinations, and observed densities increased in Milne Inlet after the sealift and ore carrier entered on consecutive days. As noted earlier, it is difficult to differentiate between natural variations in narwhal abundance and the potential effects of shipping. The data suggest that some narwhals may have left certain areas after a ship's passage but others did not.*"

Further, in the ERP FEIS Addendum Popular Summary s.4.3.1 Project Effects on VECs, Marine Environment, on page12 the proponent states that "*potential effects are expected to be reduced by decreasing ship speed and hence, minimizing sound levels. Narwhals are predicted to habituate to repeat passages of ore carriers along the northern shipping route.*"

Based on all the available literature and comments solicited from cetacean and marine acoustics experts (A. Wright, R. Reeves, L. Blight, M. Marcoux, J. Higdon, L. Weilgart, pers. Comm.., summer-fall 2013) and from a closer inspection of the Proponent's own information summaries from 2007 and 2008 (see below), WWF believes there is evidence that narwhal have been displaced from their natural summering habitat in Milne Inlet (including Koluktoo Bay) by shipping activity, and this displacement will increase significantly in response to the proposed escalation of shipping activity through the Milne Port route.

Further, there is no published evidence that supports the conclusion that narwhal will adapt and habituate quickly to intense and rapidly increasing industrial shipping activity in a previously remote region largely devoid of such noise sources. Thus, we conclude that the proposed shipping activities are likely to have a significant impact on the globally important concentration of thousands of narwhal adults and young using this area in the open-water season.

The global literature on acoustic noise in the marine environment and its impacts on cetaceans (e.g., Richardson et al. 1995; Hildebrand, 2005; Wright & Highfill 2007; U.S. Marine Mammal Commission, MMC, 2007; Nowacek et al., 2007; Southall et al. 2007; Weilgart 2007 Rolland et al. 2012) has recently been reviewed for WWF by Dr. Andrew Wright (see: Wright 2008; 2013a,b). The only published studies of the impacts of ship noise on narwhal behavior (at the floe edge in spring in Lancaster Sound – Finley et al. 1990; Cosens & Dueck 1993), found vocal and avoidance responses in narwhal when ice-breaking ships were up to/at least 30-50 km distant. The Proponent draws on these studies, but we stress here that the situation in the relatively narrow fiord of Milne Inlet is significantly different, due to the acoustic environment, the season and killer whale predation activity.

WWF has reviewed the information on narwhal response to ship activities presented by both the Proponent (ERP FEIS Addendum Volume 8) and Marcoux (who was stationed on Bruce Head, Koluktoo Bay in August 2008 during independent research on narwhal), and we've represented this information graphically in Figures 1 and 2 below. We focus here only on Milne Inlet because Eclipse Sound was not surveyed completely or in a standardized fashion by the proponents, and since Kolutkoo Bay is really a very small area at the head of the larger unit called 'Milne Inlet'. Hence, Milne seems to be the best area to examine comparatively across weeks and the two years. These examinations highlight graphically three important points:

1. Based on the aerial transect surveys, the apparent densities of narwhal in Milne Inlet are quite variable even before a ship approaches – from 0 to circa 540 narwhals per 100 km^2.

However, the general pattern is that in the majority of instances the number of narwhal declined very markedly in Milne Inlet following a vessel transit, with some indication of a reoccupation starting to occur after 3-4 days of the vessel passing (see especially 2007). Further interpretation of the data presented by the proponents is impossible because they do not supply actual timings or daily variations in observing conditions, nor is there any consideration of killer whale activity in Eclipse Sound or other adjacent fiords, which may well have influenced narwhal distribution significantly.

2. We hope that by graphing these density changes, NIRB will be able to see how more thorough analysis of the available information is needed before any meaningful conclusions can be reached. Such further analysis should include more precise information on all ship transits , and ideally accurate information on the influence of other ships in Milne Inlet (for example Coast Guard vessels that Marcoux records but the Proponent does not).

3. In all instances, with the exception of the vessel transit on 5th August 2008, the density information indicates (consistent with Marcoux 2008; and also with distribution maps presented in the ERP FEIS Addendum, for example Figure A4.1 for ship transit on 31st July and 7th August showing major redistribution of narwhal out of Milne Inlet and into Central or Western portions of Eclipse Sound) that detected narwhal density (i.e. numbers) in Milne Inlet dropped markedly after a vessel transit and had not returned to pre-transit levels within two days or longer.

Figure 1 – Graph for 2007 showing the proponent's presented mean narwhal densities (mean # of narwhal per 100km²) in Milne Inlet before and after vessel transits (shown as Day = 0), based on aerial surveys at unspecified times.

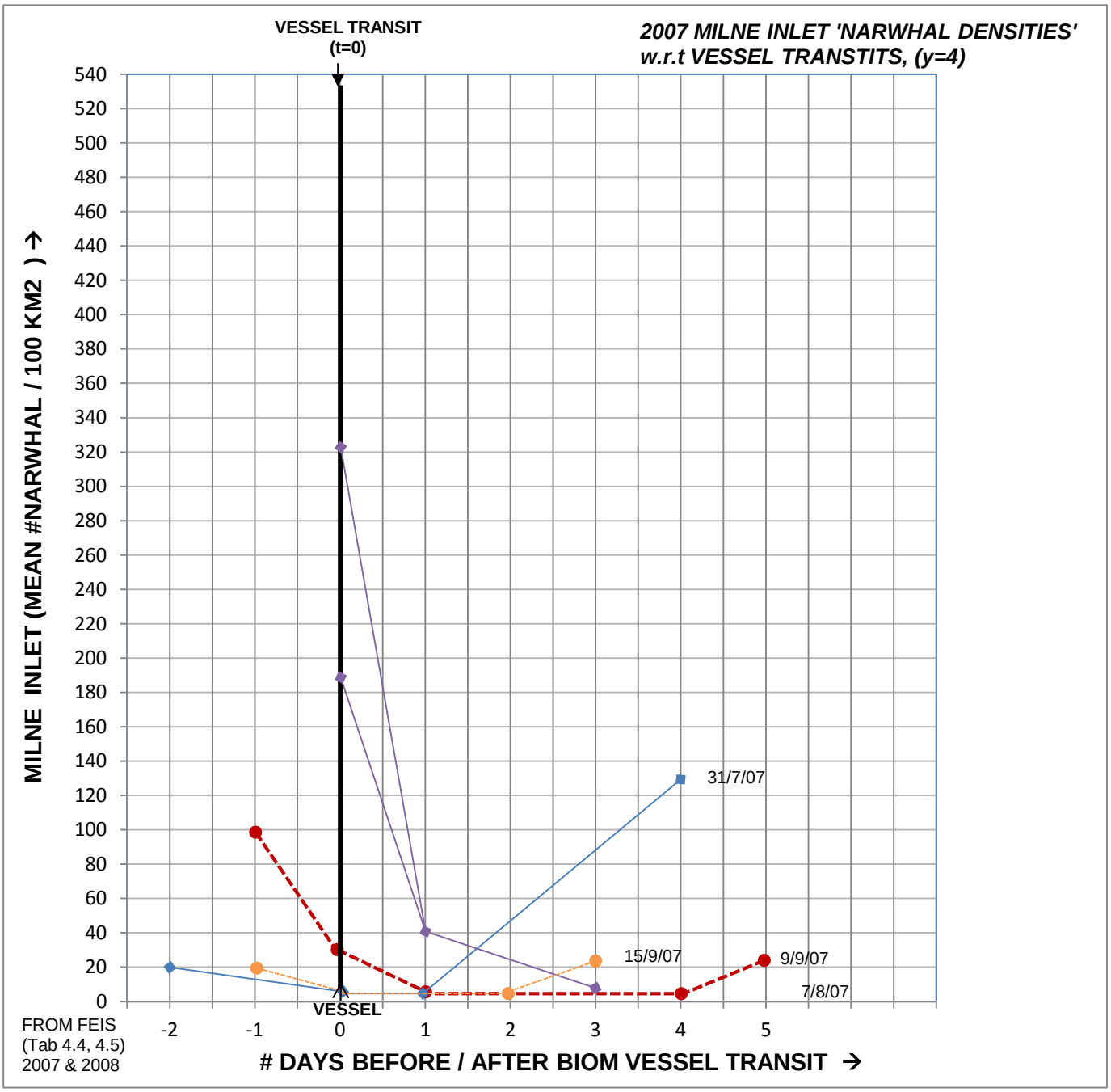
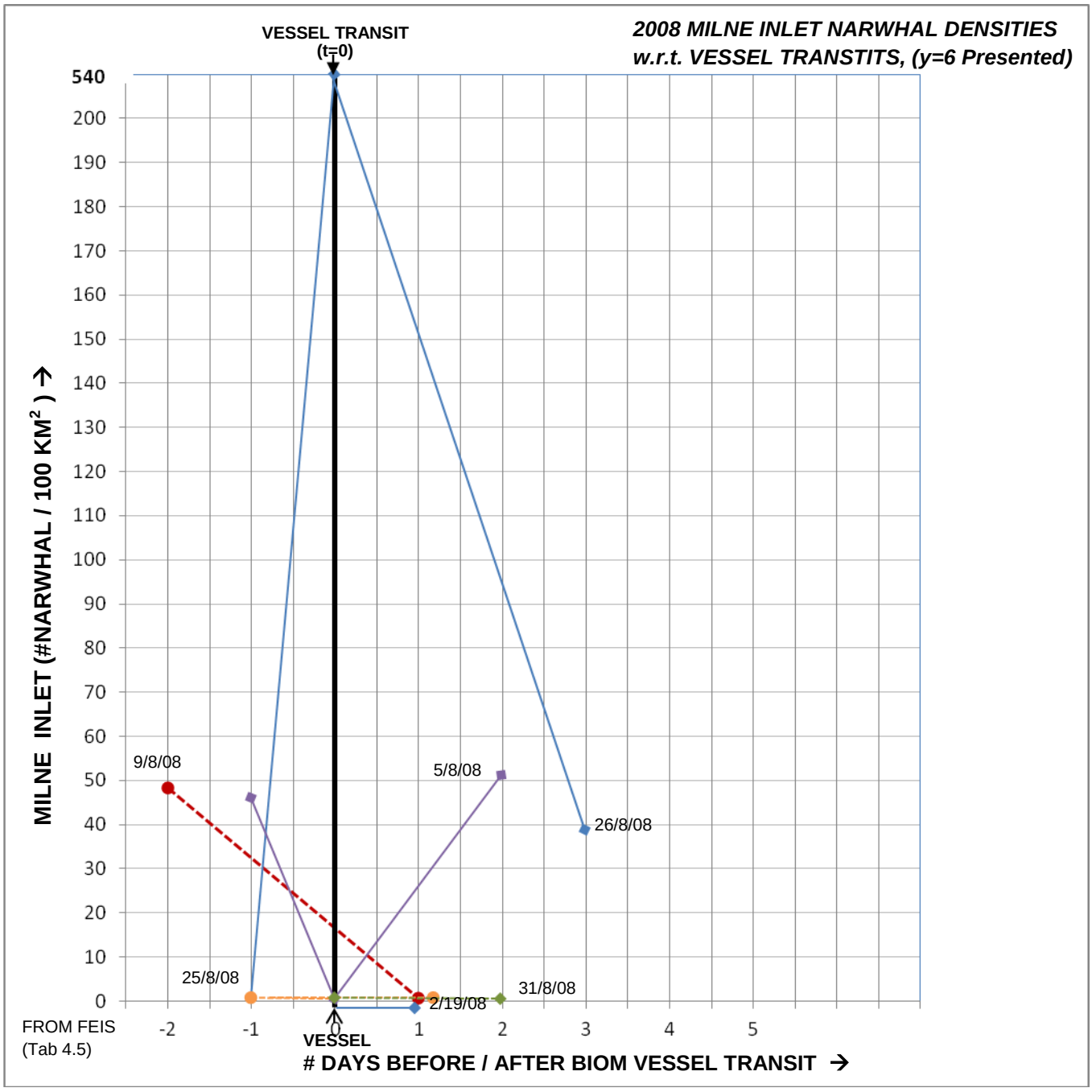


Figure 2 – Graph for 2008 showing the proponent's presented mean narwhal densities (mean # of narwhal per 100km²) in Milne Inlet before and after vessel transits (shown as Day = 0), based on aerial surveys at unspecified times.



In conclusion, if two days is considered a disturbance threshold for narwhal, then an increase in shipping to one or two transits daily in Milne Inlet through the entire open water season could render this area entirely unsuitable for the majority of narwhal (recognizing that for narwhal, as in many other wildlife species, there may be a small proportion of the population that is unusually tolerant of even large anthropogenic disturbance). At this point we know of no evidence that narwhal will be able to tolerate this level of shipping traffic and noise.

The ecological consequences of displacement of thousands of narwhal from Milne Inlet habitat should be considered carefully by NIRB. As displaced narwhal move to seek alternative summering habitats they will be exposed to several risks and costs: increased killer whale predation; increased energetic costs; and reduced access to and/or increased competition for summer prey.

The question of narwhal displacement from what is recognized to be very important natural summering habitat for thousands of narwhal is critical to the review of this proposed project change. Despite the assurances and conclusions presented in the FEIS and ERP FEIS Addendum, we believe it is likely that there will be loss and reduced quality of Milne Inlet habitat for narwhal, and that this is not in conformity with the current regional North Baffin Land Use Plan (s. 3.5.11 and 3.5.12, and Appendices G, J and K), and contrary to the purpose of the proposed Lancaster Sound National Marine Conservation Area.

Regarding the proponent's presented information on ship traffic:
In one section the Proponent estimates the ice-free period as 90 days (July 15-October 15) (ERP FEIS Addendum, Project Description s. 2.4.1). Elsewhere this period is reduced to 70 days to capture "*delays primarily due to ship travel time*" (ERP FEIS Addendum, Volume 1, p.20). The 70-day figure is likely closer to the current reality, given that during the record-low ice conditions in the summer of 2012 the ice-free period (based on < 2/10 ice cover) for Milne Inlet and Eclipse Sound was only 76 days. The significance of clarifying that the effective shipping period is only 70 days is that it increases the average intensity of traffic. With 80-90 ore transits, plus 28 equipment transits, plus 4 fuel transits, the average intensity of ship traffic is 1.6-1.7 transits per day, a more representative and higher number than the one derived by the Proponent based on a 90-day shipping season. The average number of transits per day would rise even higher if one were to use the figure of 55 ore shipments (110 transits, plus service vessels) given in the FEIS Addendum Volume 9, Cumulative Effects and other assessments (p. 3), approaching an average of 2 vessel transits per day throughout the summer season.

Regarding adaptive management measures to adjust activities and mitigate impacts in response to monitoring
The NIRB Final Hearing Report for the Mary River Project cites commitments made by the Proponent, including that "*Baffinland is committed to implementing appropriate mitigation measures including, but not limited to, periodic suspension of shipping if Baffinland determines that shipping-related activities are negatively impacting the project area*" (#33). We applaud this commitment, but suggest that the determination of negative impacts should not be left solely to the Proponent.

Furthermore, the Project Certificate for the Mary River Project, section 3.4 Flexibility notes that "*NIRB retains the ability to give additional clarification or direction on an ongoing basis*

through its Monitoring Officer, with respect to compliance requirements for the Project". This is an important mechanism for adaptive management, but we are unclear of the mechanism for implementing it.

Recommendation

- NIRB should explicitly define the ongoing roles and responsibilities of the Proponent, the Marine Environment Working Group, NIRB's Monitoring Officer and NIRB itself to define a process whereby existing and new information (including baseline research, monitoring data and IQ) is made available, is carefully reviewed and assessed (including by third parties), produces recommendations for adaptive measures, and ensures that recommendations and corrective actions are appropriately acted upon in a timely fashion.

3.3 Risk of oil spills

Importance of the issue

The spillage of oil – especially Heavy Fuel Oil – is an issue of concern in all Arctic waters, but it's of extraordinary concern in the context of the proposed Early Revenue Phase, because of the very high concentrations of marine mammals and seabirds in these areas, precisely during the proposed period of shipping activity, meaning that the consequences of a spill would be particularly grave.

References

From the ERP FEIS Addendum: Emergency response plans taking into consideration environmentally sensitive areas (Volume 9 Cumulative effects, page 28, 3.9.1.1) and environmentally sensitive areas along the Milne Inlet route have been identified (Volume 9 Cumulative effects, page 32, 3.9.1.4); on board prevention and response equipment (Appendix 10D-10, Shipping and Marine Wildlife Management Plan, section 8.1.1); routing ships to maximize distances between ships and shorelines to remain at least 2 km from seabird colonies (Appendix 10D-10, Shipping and Marine Wildlife Management Plan, section 4.5.2.2 Mitigation); working group on preparedness and emergency response (Volume 9 Cumulative effects, page 28, 3.9.1.1); response plans based on adaptive management and continuous improvement (Volume 9 Cumulative effects, page 28, 3.9.1.1); trained spill response team on site at the port (Volume 9 Cumulative effects, page 27, 3.9.1.1); annual spill exercises (Volume 9 Cumulative effects, page 29, 3.9.1.1)

WWF comments

WWF acknowledges the considerable attention paid – in the FEIS, in the NIRB Final Hearing Report for the Mary River Project and in the ERP FEIS Addendum– to identifying measures aimed at reducing the likelihood of oil spills, and enhancing the capacity to clean up spills that do occur. The largest spill – in terms of volume – would be a tanker mishap, but a mishap involving an ore carrier or supply ship resulting in the breach of its fuel tank could also have significant consequences in Milne Inlet or Eclipse Sound, given the relatively high densities of marine mammals in these waters. This would particularly be the case if the vessel is powered with or carrying Heavy Fuel Oil (HFO), since this substance is far more toxic than lighter fuels such as diesel. As outlined by Det Norske Veritas (DNV) in their report Heavy fuel in the Arctic (Phase 1) to the Arctic Council in 2011, page 38: *'…where the diesel oil has fully disappeared*

from the surface after 3 days, nearly all the HFO is still present after 20 days. In addition, after 3- 5 days most HFO's have emulsified to the maximum water content (40 – 80%). This results in a significant increase in the volume to be handled by an oil spill recovery operation. Hence the consequences of HFO spills are likely to be more severe than spills of marine diesels.'

The Proponent acknowledges the risk of a shipping accident leading to a spillage along the access route to Milne Port, but asserts (in FEIS Addendum Volume 9, s.1.4.4.2, page 14) that "*the effect of the ERP in combination with other projects and undertakings will continue to be negligible and Not Significant*". This is not consistent with the presented material or available from comparable situations elsewhere. In the same Volume, section 3.9.3 (page 30) the Proponent acknowledges that "*although the sensitivity of narwhals to spills is unknown, the large aggregation of animals in a small area could result in a significant exposure to a worst-case, open-water diesel spill.*" (note that the spill scenarios presented by the Proponent are limited to tanker spills of diesel, and not to spills of Heavy Fuel Oil, which although smaller in total spilled volume can have more long-lasting consequences). Further on in this same section, the Proponent states that "*there are large aggregations of marine birds along the proposed shipping route, particularly near the eastern mouth of Pond Inlet. Some estimates suggest that as much as 1% of some bird populations could be represented within a single aggregation (Mallory & Fontaine 2004). These aggregations represent a significant concern for a worst-case, open-water spill.*" WWF agrees.

The risks to vessel safety are significant at all times of year in Arctic conditions, due to unseasonal ice conditions and the presence in so-called 'open water' of hard-to-spot bergy bits and growlers, which are fully capable of piercing a hull that is not suitably armoured. The FEIS called for the construction of new vessels built to Polar Class 4 ruggedness, which would be immune to these 'lesser' ice hazards, but the ERP FEIS Addendum calls for the use of charter vessels to carry ore through Milne Inlet and Eclipse Sound. The use of these vessels (often procured on the open market for short-term delivery contracts, and presumably without ice-strengthened hulls) is worrisome at all times of year in Arctic waters, but particularly in the shoulder seasons, as ships under pressure to make contracted deliveries contend with lingering or worsening ice conditions.

Recommendations

- Charter vessels should adhere to restrictions limiting where and when they operate, in accordance with their particular ice class designation and according to the following ice management regimes:

  a) the Zone/Date system used by Transport Canada, which sets 'opening' and 'closing' dates for various classes of ships throughout the Canadian Arctic;

  b) the Arctic Ice Regime Shipping System (AIRSS), which is geared to the ice conditions forecast to be encountered during the projected period of the voyage;

  c) observed actual ice conditions, as determined from the bridge by a qualified ice navigator; and

d) any other provisions that may be established in the Polar Waters Operating Manual, currently under development by the International Maritime Organization (IMO) as a key component of a new Polar Code for Arctic shipping.

- No vessels servicing the project through Eclipse Sound and Milne Inlet should carry or use Heavy Fuel Oil; they should be powered by diesel or, if feasible, Liquefied Natural Gas.

3.4 Duration of Early Revenue Phase

Importance of the issue

As noted above, there is a confluence of three factors that make the impacts of the proposed Early Revenue Phase especially difficult to minimize or mitigate: The high concentrations of narwhal in Milne Inlet and Eclipse Sound; the increase in shipping activity during the summer season when the narwhals are concentrated in this region; and the relative narrowness of these bodies of water.

WWF comments

We remain skeptical that it is possible to mitigate the anticipated major impacts of the proposed Early Revenue Phase, even if all of our recommendations – and the recommendations of other stakeholders and management agencies – are fully implemented. The very real possibility exists that, over time, narwhal will be largely extirpated from Milne Inlet, and significantly impacted in Eclipse Sound.

Recommendations

- The shipping of iron ore through Milne Inlet and Eclipse Sound should be limited to a true 'early revenue phase,' and should only be allowed for eight consecutive summer seasons, after which time Steensby Inlet should be used for all ore shipments, with a formal review required for any extension beyond this period.

4. Summary of Recommendations

Recommendation #1: The Terms and Conditions from the NIRB Final Hearing Report for the Mary River Project that specifically reference particular geographic regions and locations should be reviewed and re-considered for their application in new regions of activity under the Early Revenue Phase. At a minimum, the following Terms and Conditions should be reviewed: 1, 7, 8, 9, 83, 86, 87, 94, 95, 96, 97, 99, 100, 101, 104, 105, 109, 176 and 181.

Recommendation #2: NIRB should explicitly define the ongoing roles and responsibilities of the Proponent, the Marine Environment Working Group, NIRB's Monitoring Officer and NIRB itself to define a process whereby existing and new information (including baseline research, monitoring data and IQ) is made available, is carefully reviewed and assessed (including by third parties), produces recommendations for adaptive measures, and ensures that recommendations and corrective actions are appropriately acted upon in a timely fashion.

Recommendation #3: Charter vessels should adhere to restrictions limiting where and when they operate, in accordance with their particular ice class designation and according to the following ice management regimes:

a) the Zone/Date system used by Transport Canada, which sets 'opening' and 'closing' dates for various classes of ships throughout the Canadian Arctic;

b) the Arctic Ice Regime Shipping System (AIRSS), which is geared to the ice conditions forecast to be encountered during the projected period of the voyage;

c) observed actual ice conditions, as determined from the bridge by a qualified ice navigator; and

d) any other provisions that may be established in the Polar Waters Operating Manual, currently under development by the International Maritime Organization (IMO) as a key component of a new Polar Code for Arctic shipping.

Recommendation #4: No vessels servicing the project through Eclipse Sound and Milne Inlet should carry or use Heavy Fuel Oil; they should be powered by diesel or, if feasible, Liquefied Natural Gas.

Recommendation #5: The shipping of iron ore through Milne Inlet and Eclipse Sound should be limited to a true "early revenue phase," and should only be allowed for eight consecutive summer seasons, after which time Steensby Inlet should be used for all ore shipments, with a formal review required for any extension beyond this period.

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