

# MARCH 2014

## INSIDE COVER PAGE



### **The Nunavut Impact Review Board's Primary Objectives under the Nunavut Land Claims Agreement, Article 12, Section 2.2.5:**

In carrying out its functions, the primary objectives of the NIRB shall be at all times to protect and promote the existing and future well-being of the residents and communities of the Nunavut Settlement Area, and to protect the ecosystemic integrity of the Nunavut Settlement Area. The NIRB shall also take into account the well-being of residents of Canada outside the Nunavut Settlement Area.

#### **Contact Information:**

Nunavut Impact Review Board  
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Ship—Courtesy of Baffinland Iron Mines Corp. (Photo from: *"Shipping and the Marine Environment"* Final Hearing presentation, slide 1)  
All others NIRB Internal Photos

## SIGNATURE PAGE



Photo 1: Board Members (from left) Guy Alikut, Jaypootie Aliqatuqtuq, Phillip Kadlun, Elizabeth Copland, Kaviq Kalluraq, Glenn McLean, Henry Ohokannoak

THIS REPORT IS SUBMITTED TO THE HONOURABLE BERNARD VALCOURT, MINISTER OF ABORIGINAL AFFAIRS AND NORTHERN DEVELOPMENT AND FEDERAL INTERLOCUTOR FOR METIS AND NON-STATUS INDIANS BY THE NUNAVUT IMPACT REVIEW BOARD ON THIS 17<sup>TH</sup> DAY OF MARCH, 2014.

Elizabeth Copland  
Chairperson

Phillip Kadlun  
Vice-Chairperson

Guy Alikut  
Secretary Treasurer

Henry Ohokannoak  
Board Member

Marjorie Kaviq Kaluraq  
Board Member

Glenn McLean  
Board Member

Jaypootie Aliqatuqtuq  
Board Member

March 17, 2014

*Sent via email and courier:* [bernard.valcourt@parl.gc.ca](mailto:bernard.valcourt@parl.gc.ca); [minister@aandc.gc.ca](mailto:minister@aandc.gc.ca)

**Re: Public Hearing Report for Baffinland Iron Mine Corporation's Mary River Early Revenue Phase Proposal**

Please find enclosed the Public Hearing Report of the Nunavut Impact Review Board (NIRB) summarizing the NIRB's conclusions and recommendations arising from our assessment and reconsideration of the Baffinland Iron Mines Corporation's Early Revenue Phase Proposal, NIRB File No.: 08MN053 (the ERP Proposal) under Article 12, Part 8, Section 12.8.2 of the *Nunavut Land Claims Agreement* (NLCA). The enclosed Report contains the NIRB's assessment of the potential ecosystemic and socio-economic effects of the ERP Proposal and reflects the NIRB's primary objectives under Section 12.2.5 of the NLCA. The NIRB has concluded that the ERP Proposal may proceed, provided that the project complies with the recommended revised and additional Terms and Conditions of Project Certificate No.: 005 as outlined in the attached Report.

Translated versions of the Public Hearing Report are being prepared and will be made available as soon as possible. Please contact the undersigned in writing if you have any questions regarding this matter.

Sincerely,

England

Elizabeth Copland  
Chairperson  
Nunavut Impact Review Board

cc: The Honourable Gail Shea, Minister of Fisheries and Oceans, GOC  
The Honourable Leona Aglukkaq, Minister of Environment, GOC  
The Honourable Denis Lebel, Minister of Transport, Infrastructure and Communities, GOC  
The Honourable Joe Oliver, Minister of Natural Resources, GOC  
The Honourable Peter Taptuna, Premier, GN  
Cathy Towtongie, President, Nunavut Tunngavik Incorporated  
Okalik Eegeesiak, President, Qikiqtani Inuit Association  
Mr. Tom Paddon, President and CEO, Baffinland Iron Mines Corporation  
Mr. Erik Madsen, Vice President Sustainable Development, Baffinland Iron Mines Corporation  
Mr. Oliver Curran, Director Sustainable Development, Baffinland Iron Mines Corporation  
Parties and Intervenors

# RECORD OF PROCEEDINGS

Project Proponent: Baffinland Iron Mines Corporation  
Suite 1016, 120 Adelaide Street West  
Toronto, ON  
M5H 1T1

Telephone: (416) 364-8820  
Fax: (416) 364-0193  
Website: [www.baffinland.com](http://www.baffinland.com)

Date Amended Project June 20, 2013  
Proposal Received:

Positive Conformity August 13, 2013  
Determination Received from  
the Nunavut Planning  
Commission:

Dates of Hearings January 27, 2014 to January 31, 2014, Pond Inlet, NU

Board Members Present: Elizabeth Copland, Chairperson  
Guy Alikut  
Phillip Kadlun  
Kaviq (Marjorie) Kaluraq  
Henry Ohokannoak  
Glenn McLean  
Jaypootie Aliqatuqtuq

Board Staff:	Executive Director	R. Barry
	Director of Technical Services	A. Hanson
	Technical Advisor	C. Braun Rodriguez
	Technical Advisor	H. Rasmussen
	Senior Finance Officer	P. Evalik

Board Legal Counsel: T. Meadows

Interpreters:	M. Arnakallak	Inuktitut
	T. Arnakallak	Inuktitut
	J. Tucktoo-Lacasse	Inuktitut

Court Reporters: K. McLeod  
T. Rizzoli

Sound Technicians: R. Dempster

Parties:

Proponent:	Baffinland Iron Mines Corporation:
	M. Zurowski, Executive Vice President E. Madsen, Vice President Sustainable Development G. Missal, Vice President of Corporate Affairs O. Curran, Director of Sustainable Development J. Tigullaraq, Northern Affairs Manager J. St. Paul-Butler, Environmental Analyst M. Settingington, Terrestrial Wildlife Biologist B. Armstrong, Legal Counsel C. Kowbel, Legal Counsel F. Beaulac, Consultant (FPB Management) B. LeDrew, Consultant (Sikumiut) R. Davis, Consultant (LGL Limited) R. Cook, Consultant (Knight Piésold)
Nunavut Tunngavik Inc.:	P. Irngaut, Wildlife Communications Advisor
Qikiqtani Inuit Association:	O. Eegeesiak, President S. Williamson Bathory, Director of Department of Major Projects L. Idlout, Executive Assistant to the President A. Qamaniq, Community Liaison Officer E. Inunaruk, Board Member
Nunavut Commission:	Planning S. Ehaloak, Executive Director C. Tickner, Senior Planner A. Blair, Legal Counsel
Government of Nunavut:	A. Simonfalvy, Avatiliriniq Coordinator C. Kieu, Legal Counsel R. Katsak, Department of the Environment and Transportation C. Mallory, Environmental Assessment Coordinator P. Hale, Manager of Wildlife Research
Aboriginal and Northern Development Canada:	Affairs K. Costello, Director of Resource Management M. Sewchand, Senior Environmental Assessment Specialist T. Fast, Socio-economic Analyst
Environment Canada:	M. Dahl, Senior Environmental Assessment Specialist M. Mohammed, Senior Environmental Assessment Coordinator
Department of Fisheries and Oceans:	G. Williston, Fisheries Protection Biologist
Natural Resources Canada:	K. Cavallaro, Senior Environmental Assessment Officer

Parks Canada:	A. Stoddart, Environmental Assessment Specialist J. Chisholm, Biologist and Environmental Assessment Coordinator, Nunavut Field Unit C. Elverum, Project Manager for Lancaster Sound
Transport Canada:	P. Topping, Manager of Environmental Protection C. Miller, Manager of Marine Safety
Intervenors Hamlet of Pond Inlet:	S. Elverum, Hamlet Council A. Kublu, Hamlet Council
Mittimatalik Hunters and Trappers Organization:	J. Pitseolak, Representative A. Killiktee, Manager
Dr. Zacharius Kunuk	Z. Kunuk

For access to complete records of sign-in and attendance at all Hearing venues please visit the NIRB's public registry at <http://ftp.nirb.ca>.



## CHAIRPERSON'S FOREWORD

This report has been prepared by the Nunavut Impact Review Board (NIRB or Board) for the review and consideration of the Minister of Aboriginal Affairs and Northern Development Canada (the Minister) as set out under Article 12, Sections 12.8.2 and 12.8.3 of the *Nunavut Land Claims Agreement* (NLCA). It is also the Board's hope that all Nunavummiut will see our common interests when viewing this report and the Board's conclusions. The report summarizes the results of the Board's assessment of the Early Revenue Phase Proposal submitted by Baffinland Iron Mines Corporation in 2013. The Early Revenue Phase Proposal proposes significant amendments to the Approved Project which was approved by the Board and the Minister to proceed in accordance with over 180 terms and conditions in late 2012. The reconsideration that provides the basis for this report arises from the NIRB's powers under the NLCA to reconsider the terms and conditions of an existing project certificate when changes in circumstances warrant such reconsideration.

In determining whether the Early Revenue Phase Proposal should be allowed to proceed, and if so, whether changes to the terms and conditions of NIRB Project Certificate No.: 005 for the Mary River Project, NIRB File No.: 08MN053 are necessary, the Board received, over an approximately one year period, technical and public comment on the amendments proposed, concluding with a five day Public Hearing in Pond Inlet in January 2014. During the Public Hearing, the NIRB received information from more than 70 people, including Elders, parties, intervenors, representatives from seven potentially affected communities and members of the public who all shared their knowledge, vision, hopes, experiences and concerns. During the reconsideration, the NIRB heard of ambitions mixed with cautious trepidation, optimism for real signs of economic opportunities for the Baffin Region but also concerns for the land, the air, the water and a variety of animals potentially affected by the activities under the Early Revenue Phase Proposal. The Board also considered the potential for project effects on the health and well-being of Baffinmiut and their culture.

While the NIRB understands and shares the caution expressed by many participants about the potential effects of the Early Revenue Phase Project Proposal, the Board has concluded that if undertaken in accordance with the Board's recommended limits and mitigation measures (as expressed in new and revised terms and conditions to the existing Project Certificate), the Early Revenue Phase Proposal can proceed in a manner that will protect and promote the existing and future well-being of the residents and communities of the Nunavut Settlement Area, and protect the ecosystemic integrity of the Nunavut Settlement Area. In coming to this conclusion, the Board has considered the written material filed by the parties and members of the public on the record, oral and written technical review comments received by the Board in advance of the Public Hearing and the information and views expressed by the people participating at the Public Hearing.

As always, the NIRB is very grateful to all who participated in this reconsideration, including Baffinland Iron Mines Corporation, various federal, territorial and local government representatives, Nunavut Tunngavik Inc., the Qikiqtani Inuit Association, the Nunavut Planning Commission, Elders, community representatives and members of the public; your contributions provided the foundation for the Board's decision-making and the Board quite simply could not do our work without this involvement. However, the Board recognizes that during this process some participants expressed concerns that they felt that financial, human resources, time and other capacity constraints limited their ability to participate and contribute fully at both the technical review and public hearing stages of the reconsideration. The Board

notes, with concern that these issues appear to be on the rise for many participants in the NIRB's processes. While the Board appreciates the commitment of participants who continued to contribute despite these constraints, sometimes by making personal sacrifices, the Board urges all those responsible for supporting the capacity of the participants in our processes to recognize that on-going capacity and resource constraints for participants jeopardize the Board's ability to deliver on the promise of thorough and timely assessments. In the Board's view, leaving these issues unaddressed is a cause for concern and has the potential to adversely affect all participants in future Board assessments.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Elizabeth Copland', written in a cursive style.

Elizabeth Copland  
Chairperson  
Nunavut Impact Review Board

## EXECUTIVE SUMMARY

In September 2012, the Nunavut Impact Review Board (NIRB or Board) issued our decision report<sup>1</sup> associated with the Board's review of the original Mary River Project Proposal. The scope of the original Mary River Project Proposal included the construction, operation and eventual reclamation of an iron ore mine at the site of the Mary River iron ore Deposit #1, the construction of an approximately 150 kilometres railway from the mine site to a port at Steensby Inlet, all season shipping of ore via the Steensby Inlet Port using purpose-built ore carriers with ice-breaking capability, the use of an open water port facility at Milne Inlet and the use of the existing Milne Inlet Tote Road to bring in fuel, construction equipment and personnel as required to support project construction and seasonal resupply. For the original Mary River Project Proposal, shipping through Milne Inlet would not involve shipments of iron ore and, once project construction was completed, shipping via Milne Inlet would be significantly reduced. In the Board's 2012 report the Board concluded that if the original Mary River Project Proposal was developed in accordance with the Board's recommended 182 terms and conditions, the project could proceed to the regulatory stage. Subsequently in December 2012 the Minister of Aboriginal Affairs and Northern Development accepted the Board's report and recommendations and directed the Board to issue a Project Certificate for the Mary River Project Proposal.

Shortly after the Board issued NIRB Project Certificate No.: 005 for the original Mary River Project Proposal, Baffinland Iron Mines Corporation (BIMC or the Proponent) wrote to the Board to advise that due to significant changes in the global economy that had occurred after the NIRB concluded its review of the original project, BIMC required significant changes to the project's development plans and schedule for development.

Under BIMC's changed plans for project development which it named the "Early Revenue Phase Proposal", BIMC proposed to make the following changes to activities and undertakings from the original Mary River Project Proposal:

- Mining an additional 3.5 - 4.2 million tonnes of iron ore each year from Deposit #1, with mining to commence prior to construction of the railway and port site at Steensby Inlet and to continue throughout the 21 year life of the mine;
- Transporting the additional iron ore from the Mine Site to Milne Port via the Tote Road;
- Storing 3.5 – 4.2 million tonnes of iron ore at Milne Port;
- Shipping 3.5 – 4.2 million tonnes of iron ore from the Milne Port to markets in Europe during the open water season throughout the life of the mine; and
- Delaying the development of the original Mary River Project (including the development of Steensby Port, the railway and the commencement of all season shipping via Steensby Port) until sufficient revenue would be generated by the Early Revenue Phase Proposal to secure the project financing required to develop the larger Mary River Project as originally proposed.

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<sup>1</sup> NIRB File No.: 08MN053, Final Hearing Report for the Mary River Project, Baffinland Iron Mines Corporation, September 14, 2012.

After soliciting comments regarding whether, under Article 12, Section 12.8.2 of the Nunavut Land Claims Agreement (NLCA) it was appropriate for the Board to conduct an assessment of these changed activities and undertakings and a reconsideration of existing Project Certificate No.: 005 in light of the changes, the NIRB announced that BIMC had established that there were changed circumstances that warranted further assessment and reconsideration by the NIRB.

Although there are no mandatory process requirements for the Board's assessment and reconsideration set out under NLCA Article 12, Part 8, Section 12.8.2, given the nature and extent of the changes to the original Mary River Project Proposal requested by BIMC under the Early Revenue Phase Proposal, the NIRB determined that a full and thorough technical review of the Proposal would be required and that the Board would also require a Public Hearing in the community most likely to be directly affected by the revised activities and undertakings, namely Pond Inlet, Nunavut. Throughout the NIRB's assessment and reconsideration of the Early Revenue Phase Proposal, the Board was guided by our central objectives: protecting and promoting the existing and future well-being of the residents and communities of Nunavut; and the protection of Nunavut's ecosystemic integrity.

Reflecting these objectives, during this process the Board heard evidence on several key ecosystemic issues, including the potential for project effects on:

- marine wildlife associated with increased shipping through Eclipse Sound;
- the marine environment in Milne Inlet arising from increased shipping, port construction and ballast water exchanges;
- vegetation, wildlife, ice, surface water and human health as a result of increased dust emissions; and
- Inuit harvesting activities on land and in marine areas due to increased shipping and intensification of use of the Tote Road.

At the Public Hearing, BIMC asked the Board to grant it "operational flexibility" to allow for a variance of up to 20% in terms of the additional volume of ore that could be mined, transported via the Tote Road and shipped out of Milne Inlet in any given year. BIMC indicated that this level of flexibility was required so that when the actual operating conditions in a specific year reduce the mining, transportation and shipment of ore, BIMC has the flexibility to make up for such reductions by increasing production, transportation and shipping by up to 20% subsequently in more favorable years. As indicated in this report, the Board and many of the participants in this process, recognize that there are many variables at play that could impose limits on the volume of ore that could be safely and economically mined, transported and shipped in any given year. However, the NIRB also recognizes that if the requested 20% operational variability is granted without any limitations, and conditions were such that BIMC was able to take full advantage of the upper limit on an annual basis, within 5 years the total volume of iron ore mined, shipped and transported could be almost double that originally requested under the Early Revenue Phase Proposal. The Board has serious reservations regarding the potential for increased effects on marine mammals and the life of the mine that could be associated with BIMC extracting, shipping and transporting this additional 20% when the increased volume is added to the volumes already authorized by the Board to be mined, transported and shipped under the original Mary River Project Proposal when the railway and all season shipping from Steensby Port commence. The Board has, therefore, allowed for operational flexibility during the time when BIMC's operation is limited to mining under the Early Revenue Phase Proposal but has added a total annual limit on the amount of

ore that can be mined from Deposit #1 once mining commences under the original Mary River Project Proposal as well.

In addition to the potential ecosystemic effects, the Board also considered information regarding the potential socio-economic effects of the Early Revenue Phase Proposal on the communities most likely to be affected, the Qikiqtaaluk region, the Nunavut Settlement Area and Canada in general.

As with the Board's consideration of the original Mary River Project Proposal, in the assessment and reconsideration of the Early Revenue Phase Proposal, the NIRB heard from several participants that there were issues regarding inadequate baseline and associated effects predictions with respect to likely project effects on the current populations of terrestrial mammals (caribou) and marine mammals (bowhead and narwhals). Reflecting this uncertainty, several participants urged the NIRB to adopt a "precautionary approach" to address these gaps in data and effects predictions. Applying the precautionary approach to the Early Revenue Phase Proposal requires that the Board conclude that despite uncertainty, the potential for significant adverse project effects could be limited by BIMC taking appropriate precautions and by ensuring an ongoing, pro-active and robust approach to adaptive management. Further, as noted in our review of the original Mary River Project Proposal:

*From a practical perspective, the precautionary approach also requires the NIRB, Baffinland Iron Mines Corporation and all parties with regulatory and monitoring responsibilities for the Project to commit to an ongoing role for the life of the Project in relation to monitoring, assessing the effectiveness of measures designed to maximize positive effects and prevent or limit adverse effects and ensuring that these measures are reviewed and adapted where necessary to reflect the actual project effects being observed.<sup>2</sup>*

With this recognition in mind, and after due consideration of these factors, the information provided to the NIRB during this assessment and reconsideration, and reflecting the Board's thorough approach to the assessment and reconsideration of BIMC's Early Revenue Phase Proposal, the NIRB recommends to the Minister of Aboriginal Affairs and Northern Development that the Early Revenue Phase Proposal may proceed to the regulatory phase if the project is developed in accordance with the limits and mitigation measures included in the additional and revised terms and conditions of Project Certificate No.: 005 as outlined in greater detail in this report.

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<sup>2</sup> NIRB File No.: 00MN053, Final Hearing Report for the Mary River Project, Baffinland Iron Mines Corporation, September 14, 2012, Executive Summary at pp. xi and xii.

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<sup>3</sup> ᐃᑭᑎᓕᓚᔨᑦ ᑎᑎᓈᐅᑎᖅ : 08MN053, ᐅካᓂᖅ ᑭᖅᓴᓕᖅ ᓄᐅᓪᓂ ᐅᖅᓴᐅᒻᒥ, <ᐱᑦᓇᓂᓂᑦ, ᓯᑦᓕᒻᓗ 14, 2012.







## SOMMAIRE

En septembre 2012, la Commission du Nunavut chargée de l'examen des répercussions (CNER ou Commission) a émis le rapport de sa décision<sup>1</sup> relative à son examen de la proposition de projet de la rivière Mary. Initialement, cette proposition englobait la construction, l'exploitation et l'éventuelle réclamation d'une mine de fer au gisement no.1 du site de la rivière Mary, ainsi que la construction d'un lien ferroviaire d'environ 150 km depuis le site de la mine jusqu'à un port à Steensby Inlet d'où serait effectué, en toutes saisons, le transport du minerai de fer par des minéraliers brise-glace sur mesure. La proposition visait aussi l'utilisation pendant la saison des eaux libres d'une installation portuaire dans le bras de mer Milne et l'utilisation de l'actuel chemin d'approvisionnement à Milne Inlet afin d'amener le carburant, l'équipement de construction et le personnel requis pour la construction du projet et pour son réapprovisionnement saisonnier. Dans la proposition initiale du projet de la rivière Mary, le transport maritime par le bras de mer Milne n'incluait pas les cargaisons de minerai de fer et, une fois la construction terminée, l'utilisation de cette route maritime serait grandement diminuée. Dans son rapport de 2012, la Commission concluait que si la proposition initiale du projet de la rivière Mary était exécutée conformément aux 182 modalités et conditions recommandées, le projet pourrait passer en phase réglementaire. Par conséquent, en décembre 2012, le ministre des Affaires autochtones et du Développement du Nord Canada, a accepté le rapport et les recommandations de la Commission qu'il a chargée de délivrer un Certificat de projet pour la proposition de projet de la rivière Mary.

Peu de temps après la délivrance du Certificat de projet no. 005 de la CNER, la Baffinland Iron Mines Corporation (BIMC ou le Promoteur) a écrit à la CNER pour l'aviser qu'à cause des importants changements survenus dans l'économie mondiale après l'examen du projet initial, elle réclamait de substantielles modifications aux plans de développement et à l'échéancier du projet.

Dans son plan de changements proposés, qu'elle nommait « la phase de revenu initial », la BIMC suggérait d'apporter aux activités et entreprises initialement prévues du projet de la rivière Mary, les modifications suivantes:

- Produire 3,5 à 4,2 millions de tonnes supplémentaires de minerai de fer par an du gisement no.1 et commencer cette extraction avant la construction de la voie ferrée et du port dans le bras de mer Steensby et continuer ainsi jusqu'à la 21<sup>ème</sup> année d'ouverture de la mine.
- Transporter le minerai supplémentaire par le chemin d'approvisionnement, du site de la mine jusqu'au port Milne.
- Expédier les 3,5 à 4,2 tonnes supplémentaires de minerai de fer depuis le port Milne jusqu'aux marchés européens pendant la période d'eaux libres et pendant toute la durée de la mine; et

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1. Dossier no. : 08MN053 de la CNER, rapport de l'audience finale du projet de la rivière Mary, Baffinland Iron Mines Corporation, 14 septembre 2012

- Retarder le développement du projet initial de la rivière Mary (incluant la construction du port Steensby et de la voie ferrée ainsi que le début du transport maritime toutes saisons via le port de Steensby) jusqu'à ce que la phase de revenu initial génère suffisamment de revenus pour sécuriser le financement requis pour développer le projet rivière Mary initialement proposé, de plus grande envergure.

Après avoir sollicité des commentaires sur la pertinence d'effectuer, conformément au sous-alinéa 12.8.2 de l'article 12 de l'Accord sur les revendications territoriales du Nunavut (ARTN), une évaluation des changements proposés aux activités et entreprises et un réexamen de l'actuel Certificat de projet no.005, la CNER a annoncé que, tel qu'établi par la BIMC, les changements circonstanciels exigeaient une évaluation supplémentaire des incidences du projet et un réexamen des modalités du certificat.

Bien qu'aucune exigence de processus n'ait été imposée pour l'évaluation et le réexamen entrepris par la Commission au titre du sous-alinéa 12.8.2 de l'article 12 de l'ARTN, la Commission a décidé, étant donné la nature et l'envergure des changements proposés par la BIMC au projet initial de la rivière Mary, qu'un examen technique complet et minutieux s'imposait et qu'elle exigerait des audiences publiques dans la communauté la plus touchée par les activités et entreprises modifiées, à savoir Pond Inlet, Nunavut. Pendant toute la durée de son évaluation et réexamen de la phase de revenu initial proposée par la BIMC, la Commission a tenu compte de ses objectifs centraux : protection et promotion du bien-être actuel et futur des résidents et des communautés du Nunavut, ainsi que la protection de l'intégrité écosystémique du territoire.

Tout au long de ce processus, et à la lumière de ces objectifs, la Commission a entendu des preuves sur plusieurs enjeux écosystémiques importants, incluant d'éventuelles conséquences sur :

- la faune marine suite à une navigation plus intense à travers l'Eclipse Sound;
- Le milieu marin à Milne Inlet, suite à une navigation accrue, de la construction du port et des échanges des eaux de ballast;
- la végétation, la faune, la surface de l'eau et la santé humaine, suite à une augmentation des émissions de poussière; et
- les activités inuites de récolte dans les régions terrestres et marines, suite à une navigation accrue et une utilisation plus intensive du chemin d'approvisionnement.

Lors de l'audience publique, la BIMC a demandé à la Commission de lui accorder une « souplesse opérationnelle » une variation allant jusqu'à 20%, pour toute année donnée, de la quantité supplémentaire de minerai de fer susceptible d'être extraite, transportée via le chemin d'approvisionnement et expédiée à partir de Milne Inlet. La BIMC a ainsi expliqué que s'il arrivait, certaines années, que les conditions d'exploitation réelles engendrent une réduction de la production, du transport et de l'expédition du minerai de fer, cette souplesse opérationnelle lui permettrait, au cours d'années plus favorables, d'accroître jusqu'à 20% la production, le transport et l'expédition de cette ressource. Tel qu'indiqué dans ce rapport, la Commission et plusieurs participants ont reconnu

que plusieurs variables en jeu pourraient imposer des limites du volume de minerai pouvant être extrait, transporté et expédié pour une année donnée. Mais si cette fluctuation opérationnelle de 20% était accordée sans aucune limite et que les conditions d'exploitation soient telles que la BIMC puisse se prévaloir de la limite supérieure sur une base annuelle, le volume total de minerai de fer extrait, transporté et expédié en cinq ans pourrait être pratiquement le double du volume initialement requis au titre de la phase de revenu initial proposée par la BIMC. La Commission a émis de sérieuses réserves quant aux conséquences éventuelles que l'extraction, le transport et de l'expédition des 20% supplémentaires ajoutés aux quantités déjà autorisées dans le projet initial de la rivière Mary, pourraient avoir sur les mammifères marins et sur la vie de la mine quand commencerait à Port Steensby, le transport toutes saisons par voie ferrée et par voie maritime. Par conséquent, la CNER a accordé la souplesse opérationnelle pour la période au cours de laquelle l'exploitation de la BIMC sera limitée au titre de la phase de revenu initial; mais elle a ajouté une limite totale annuelle quant au volume de minerai qui pourra être extrait du gisement no.1 dès que débutera l'exploitation accordée au titre de la proposition initiale du projet de la rivière Mary.

Outre les effets éco-systémiques, la Commission a également examiné les données concernant les éventuelles répercussions socioéconomiques de la phase de revenu initial sur les communautés les plus touchées, sur la région du Qikiptaalik, sur la région du Nunavut et sur le Canada en général.

Après s'être concentré, lors de l'évaluation et du réexamen, sur la proposition initiale du projet de la rivière Mary, la CNER a appris, à partir des commentaires de plusieurs participants, que les prévisions de base inappropriées et les effets connexes, posaient des problèmes quant aux éventuelles conséquences sur les actuelles populations de mammifères terrestres (caribous) et marins (narvals, baleines boréales). Devant cette incertitude, plusieurs participants ont exhorté la CNER à adopter une « approche préventive » pour s'attaquer à ces lacunes en matière de prévisions de données et de conséquences. En appliquant l'approche préventive à la phase de revenu initial proposée par la BIMC, la Commission devra conclure que malgré l'incertitude, la BIMC pourra limiter d'importantes conséquences néfastes en prenant les précautions appropriées et en adoptant une gestion adaptative soutenue et proactive. De plus, tel que mentionné dans notre examen de la proposition initiale du projet de la rivière Mary:

*D'un point de vue pratique, l'approche préventive exige également que la CNER, la Baffinland Iron Mines Corporation et toutes les parties ayant un rôle jouer dans la réglementation et la surveillance du projet, prennent l'engagement de s'investir pendant toute la durée de vie du projet, dans la surveillance et dans l'évaluation de l'efficacité des mesures prévues pour maximiser les conséquences positives et prévenir ou limiter les conséquences indésirables et dans l'assurance que ces mesures seront revues et adaptées si nécessaire pour refléter les conséquences réellement observées dans le projet actuel.<sup>2</sup>*

En tenant compte de cette affirmation et après avoir attentivement examiné tous ces facteurs ainsi que l'information qui lui a été fournie pendant l'évaluation et le réexamen, et en se basant sur son approche exhaustive de l'évaluation et du réexamen de la phase de revenu initial proposée par la BIMC, la CNER recommande au ministre des Affaires autochtones et du Développement du Nord Canada, que la phase de revenu initial passe à la phase de réglementation si le projet est développé conformément aux limites

et mesures de d'atténuation incluses dans les modalités et conditions supplémentaires et révisées du Certificat de projet no.005, telles que stipulées plus amplement dans ce rapport.

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# 1. INTRODUCTION

## 1.1 Project Overview

The Mary River Early Revenue Phase (ERP) Proposal, NIRB File No.: 08MN053 consists of a proposed amendment to the Mary River Project (Project Certificate No.: 005).<sup>5</sup> The Proponent of the ERP Proposal is Baffinland Iron Mines Corporation (the Proponent or Baffinland) and the proposed ERP is comprised of three main project locations:

- Mary River mine site;
- Milne Inlet Tote Road; and
- Milne Port.

The Mary River mine site is located approximately 280 kilometres (km) from Arctic Bay, 415 km from Clyde River, 192 km from Hall Beach, 155 km from Igloolik, 1000 km from Iqaluit and 160 km from Pond Inlet (Figure 1). The Milne Inlet Tote Road is an approximately 100 km road that connects the mine site to Milne Port (Figure 2), with Milne Port located to the north of the mine site (Figure 3).

The ERP Proposal includes the extraction of an additional 3.5 million tonnes per year (Mt/a) of iron ore from the Mary River mine site, which would be transported by truck along the Milne Inlet Tote Road and shipped from Milne Port during the open water season. The ERP is in addition to the approved Mary River Project (Approved Project) which received approval from the Nunavut Impact Review Board (NIRB or the Board) in December 2012, to extract 18 Mt/a of iron ore from the Mary River open pit mine site, transport the ore by railway to a port in Steensby Inlet whereby the ore would be shipped to markets in Europe.

The proposed ERP construction phase would last two years and commence immediately following the amendment to the Project Certificate, if approved by the Board. The ERP operations schedule is proposed to begin as early as 2014 and would continue for the duration of the life of mine (i.e., 21 years), running in conjunction with the Approved Project. If the ERP Proposal is approved by the Board, construction of the larger Approved Project is expected to begin in 2015 and be completed by 2019. The ERP closure period would be 3 years and post-closure monitoring phase would be expected to last 5 years.

The issue of operational flexibility was raised at the Public Hearing for the ERP, with Baffinland asking the Board to grant them operational flexibility of 20% for the ERP. Baffinland stated that operational flexibility was important for the ERP given the fact that mining operations experience variability due to

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<sup>5</sup> Project Certificate No.: 005 was issued by the NIRB on December 28, 2012 following the Minister of Aboriginal Affairs and Northern Development's approval of Baffinland's Mary River Project.

many factors including ore production, logistics, weather and market demand.<sup>6</sup> If operational flexibility were to be approved by the Board, this would allow Baffinland to mine an additional 4.2 Mt/a of iron ore and transport this ore along the Milne Inlet Tote Road to Milne Port for shipping to European markets.

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<sup>6</sup> E. Madsen, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, p. 316, lines 19-26, p. 317, lines 1-26, p. 318, lines 1-26, p. 319, lines 1-16.

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Figure 1: Early Revenue Phase Project Location

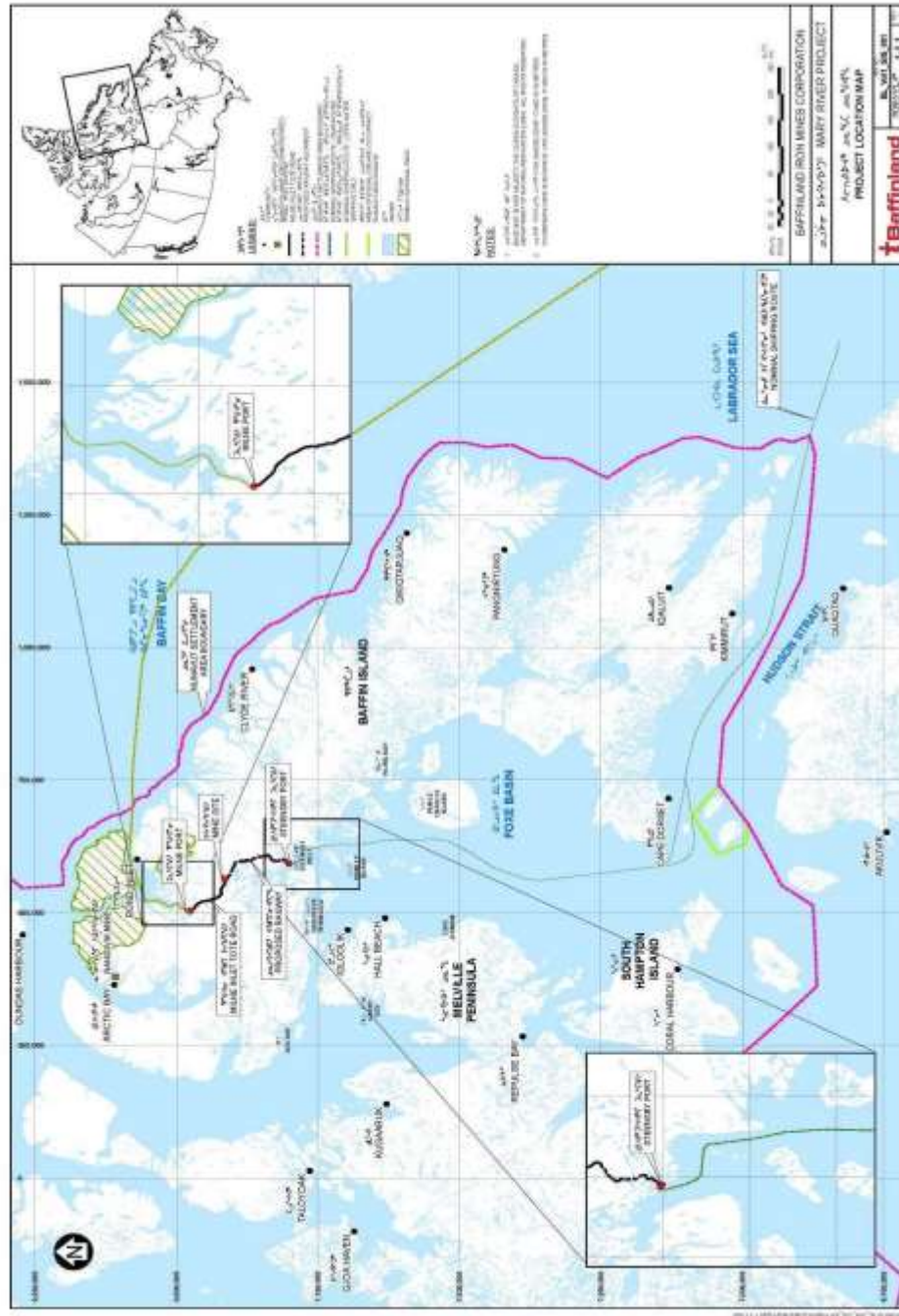


Figure 2: Milne Inlet Tote Road Location

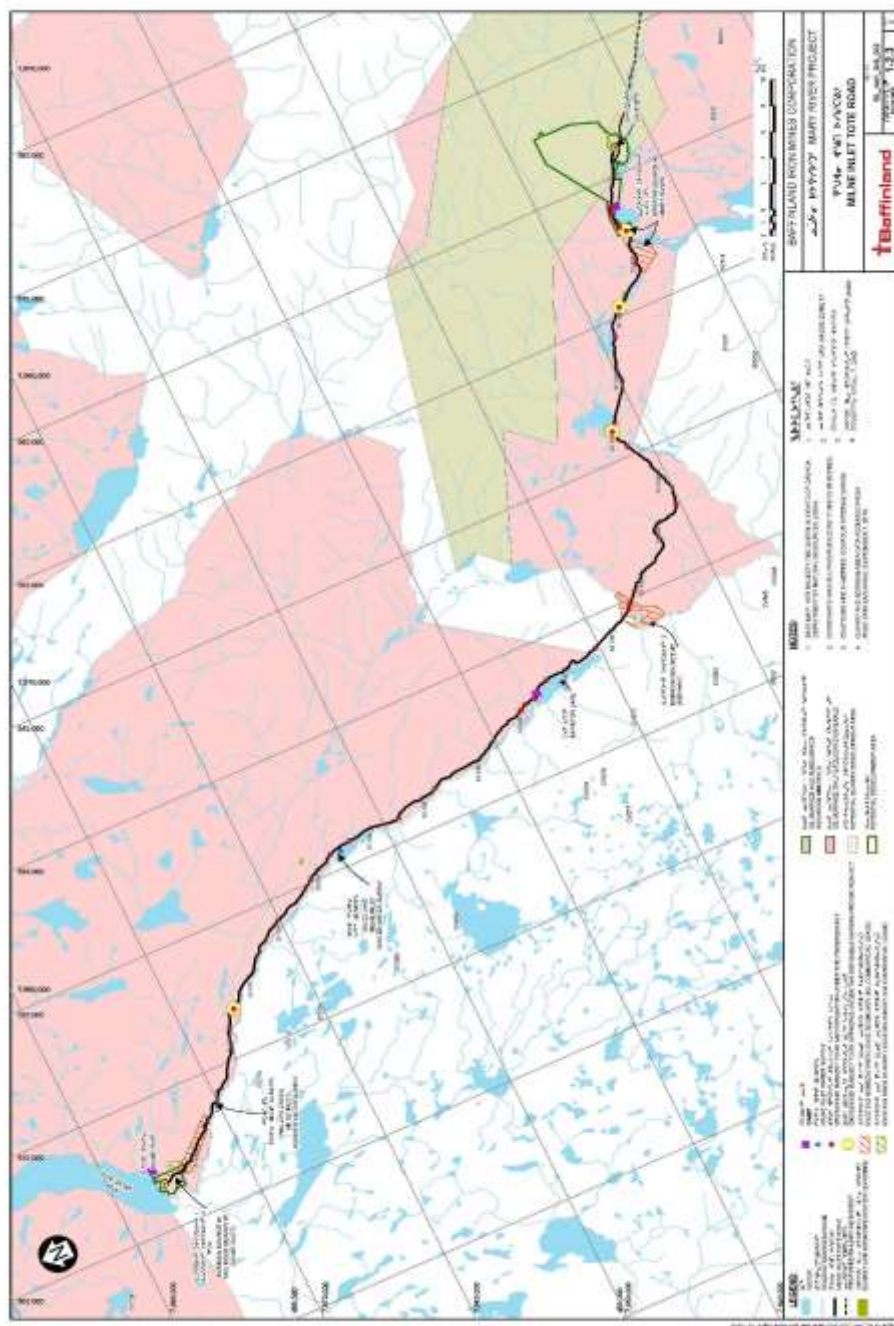


Figure 3: Proposed Milne Inlet Port Layout



## **1.2 Procedural History**

### **1.2.1 Key Procedural Steps in the 12.8.2 Reconsideration of the Terms and Conditions of the NIRB's Mary River Project Certificate**

Baffinland Iron Mines Corporation's (Baffinland or the Proponent) Mary River Project as originally considered by the Nunavut Impact Review Board (NIRB) pursuant to Article 12, Parts 4 and 5 of the Nunavut Land Claims Agreement (NLCA) involved the development of an open pit iron ore mine on northern Baffin Island, with associated infrastructure to include a tote road between Milne Inlet and a mine site at Mary River, ports at Milne Inlet and Steensby Inlet and a railway connecting the mine to the Steensby Port. Iron ore would be transported from the mine site via the railway to the port at Steensby Inlet, with year-round shipping of ore through Foxe Basin and Hudson Strait to markets in Europe using custom designed ore carriers (NIRB File No.: 08MN053).

The original application for the Mary River mine project was screened in accordance with Article 12, Part 4 of the NLCA and on June 27, 2008, the NIRB recommended to the Minister of Indian and Northern Affairs Canada (now Aboriginal Affairs and Northern Development Canada) that the Mary River Project be the subject of a public review pursuant to NLCA 12.4.4 (b). On February 11, 2009 the Minister of INAC referred the Mary River Project to the NIRB for review pursuant to Article 12, Part 5 of the NLCA. The NIRB conducted a thorough public review of information provided by Baffinland and parties, including numerous opportunities for technical review and public input including the solicitation of expert testimony and community-level input at a Final Hearing held from July 16 through July 28, 2012 in the communities of Iqaluit, Igloolik, and Pond Inlet, Nunavut. Upon completion of the Final Hearing for the Mary River Project, the NIRB provided a report of its findings to the Minister of Aboriginal Affairs and Northern Development on September 14, 2012 and the following presents a summary of the key recommendations provided to the Minister in the Board's report:<sup>7</sup>

- Establishment of key working groups in relation to the marine environment and the terrestrial environment, and new duties for the existing Qikiqtaaluk Socio-Economic Monitoring Committee in relation to the socio-economic environment. These groups will provide direction and guidance regarding: adding to baseline information during construction and before project operations commence; monitoring and reporting regarding effects occurring during operations; and providing advice regarding changes that may be

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<sup>7</sup> NIRB Final Hearing Report for the Mary River Project, NIRB File No.: 08MN053, submitted to the Minister of Aboriginal Affairs and Northern Development, September 14, 2012.

required to make sure the management of negative impacts is effective and that lasting damage is prevented.

- Ensuring that the communities which experience project effects are consulted on an ongoing basis throughout the life of the Project regarding the best ways to prevent and limit negative effects.
- Requiring that centralized access to project information be provided, including monitoring and regulatory information as it is produced.
- Imposing limits on the total number of ships travelling the shipping route during the open water season.

On December 3, 2012 the Minister of Aboriginal Affairs and Northern Development responded to the NIRB's Final Hearing Report, accepting the Board's findings and the recommended terms and conditions therein, ultimately determining that the project be allowed to proceed to the licensing stage. The NIRB held a Project Certificate workshop with regulators in December 2012, following which, on December 28, 2012, the Board issued Project Certificate No.: 005 to Baffinland for the Mary River Project.<sup>8</sup>

On January 13, 2013 the NIRB received correspondence from Baffinland which indicated that, due to various business drivers, Baffinland was proposing to make changes to the schedule and specific activities in the initial stages of project development associated with the Mary River Project. The proposal involved incorporating an "Early Revenue Phase" into the development plans for the Mary River Project, and as set out by Baffinland, would involve the proposed amendment of specific project components and activities which had not previously been subject to impact assessment by the Board during its Review of the Mary River Project, nor to the subsequent approval processes of various responsible authorities. Baffinland noted its understanding that the Project amendment request (the Early Revenue Phase or ERP Proposal) may necessitate a reconsideration of the Terms and Conditions contained within Project Certificate No.: 005 as issued by the NIRB for the Mary River Project pursuant to NLCA Section 12.8.2.

On January 14, 2013 the NIRB requested that interested parties review a description of Baffinland's ERP Proposal and provide comments to the NIRB by February 4, 2013 (later extended to February 5, 2013 at the request of parties) regarding the following:

- Whether the proposed changes as presented in the request meet the requirement for reconsideration as set out in the NLCA, Section 12.8.2(a), (b), or (c), and if so, which provisions of the NLCA trigger the reconsideration;
- Whether at that point in time the parties had identified any specific terms and conditions within Project Certificate No.: 005 that would need to be reconsidered or amended to reflect the ERP;

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<sup>8</sup> NIRB Project Certificate No.: 005, December 28, 2012.

- Whether a reconsideration of the Project Certificate terms and conditions would be likely to arouse significant public concern, and if so, a description of the basis for the concern;
- Whether parties had comments or concerns regarding the potential format of the update or addendum to the existing Final Environmental Impact Statement (FEIS) required to support the reconsideration of the Project Certificate; and
- Any matter of importance to the Party related to the request to reconsider the terms and conditions of the Project Certificate by the NIRB.

On or before February 5, 2013, the NIRB received comments from the following parties with respect to the consideration of Baffinland's ERP Proposal:

- |  |                               |
|--|-------------------------------|
| ▪ Baffinland Iron Mines Corporation                  | ▪ Environment Canada          |
| ▪ Qikiqtani Inuit Association                        | ▪ Fisheries and Oceans Canada |
| ▪ Government of Nunavut                              | ▪ Natural Resources Canada    |
| ▪ Aboriginal Affairs and Northern Development Canada | ▪ Parks Canada                |
| ▪ Canadian Arctic Resource Committee                 | ▪ Transport Canada            |
| ▪ Canadian Coast Guard                               | ▪ Hamlet of Pond Inlet        |
| ▪ Canadian Transportation Agency                     | ▪ Hamlet of Igloolik          |
|  | ▪ Paniloo Sangoya             |

On February 7, 2013 the NIRB received a submission from the Nunavut Planning Commission (NPC) which identified that a conformity determination against the North Baffin Regional Land Use Plan (NBRLUP) may be required for the amended project components and activities as presented by Baffinland.

After considering the information provided by the Proponent, comments submitted by parties and options available pursuant to the NLCA, the NIRB determined that a reconsideration of the Terms and Conditions contained within Project Certificate No.: 005 was warranted, pursuant to NLCA 12.8.2(b) which states:

*12.8.2 NIRB may on its own account or upon application by a DIO, the proponent, or other interests, reconsider the terms and conditions contained in the NIRB certificate if it is established that:*

- (b) the circumstances relating to the project or the effect of the terms and conditions are significantly different from those anticipated at the time the certificate was issued*

The Board determined that the information provided by Baffinland and the comments submitted by parties clearly establish that the circumstances relating to the Project were significantly different than had been originally anticipated during its consideration of the Mary River Project. The Board noted that its reconsideration would determine whether the proposed Project amendment should be allowed to proceed and, if so, whether the wording of specific Terms and Conditions within the Project Certificate would require updating and/or inclusion of additional Terms and Conditions.



In order to facilitate the Board's assessment of the environmental and socio-economic impacts associated with the ERP Proposal, Baffinland was requested to prepare a comprehensive addendum to the Mary River FEIS describing all aspects of the ERP Proposal, including updates to relevant baseline data, impact predictions and proposed mitigation measures and monitoring plans. The Board further noted that Baffinland's Addendum to the FEIS must meet relevant criteria as set out in the NIRB's EIS Guidelines and subsequent Addendum to EIS Guidelines as issued to Baffinland for the Mary River Project on November 16, 2009 and November 10, 2010<sup>9</sup>, respectively.

On February 11, 2013 the NIRB provided an update to then-Minister of Aboriginal Affairs and Northern Development, the Honourable John Duncan, in relation to the Board's determination under Article 12, Part 8, Section 12.8.2(b) of the NLCA that it was appropriate and advisable for the Board to reconsider the terms and conditions of Project Certificate No.: 005 as issued by the Board to Baffinland on December 28, 2012 for the Mary River Project (NIRB File No.: 08MN053). The Board also requested that the Minister provide it with any direction regarding priorities and reasonable time frames associated with the Board's reconsideration of the terms and conditions of Project Certificate No.: 005 as set out in Article 12, Part 8, Sections 12.8.3 and 12.5.4 of the NLCA. Furthermore, the Board noted that the NPC had indicated in correspondence to the NIRB on February 7, 2013 that the Road Haulage Option included within the initial technical review of the Draft Environmental Impact Statement had not been reviewed by the NPC for conformity with the applicable land use plan and that the routing as proposed in Baffinland's ERP proposal, had not been considered within the NPC's positive conformity determination issued for the Mary River Project on April 30th, 2008. Reflecting the NPC's jurisdiction, the NIRB noted that it would require confirmation from the NPC that the proposed Project amendment conformed to the requirements of the NBRLUP before it would commence with next steps in its reconsideration process.

The NIRB received the Minister of Aboriginal Affairs and Northern Development, Honourable Bernard Valcourt's response to its February 11, 2013 correspondence on April 3, 2013. The Minister indicated that he trusted the Board would undertake an expeditious and thorough review of Baffinland's amendment application, and further, that the NIRB's reconsideration process could proceed, as appropriate, concurrently with the NPC's conformity determination process.<sup>10</sup>

On June 20, 2013 the NIRB acknowledged receipt of Baffinland's Addendum to the FEIS submission for the ERP Proposal and initiated an internal review of the submission to determine whether or not it conformed to the EIS Guidelines issued to Baffinland by the NIRB. The Board noted that it would not complete its internal review until a conformity determination had been received from the NPC. On August 13, 2013 the NIRB received a conditional conformity determination from the NPC which advised

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<sup>9</sup> The Addendum to the original EIS Guidelines were issued to Baffinland by the NIRB in 2010 in order to address the Proponent's "Road Haulage Option" alternative as presented at the time. The Board determined that the "Road Haulage Option" was closely aligned with the ERP amendment request, and that the November 2010 Addendum to the EIS Guidelines would provide sufficient direction for the Proponent to prepare materials that would facilitate the NIRB's Reconsideration of the Mary River Project Certificate terms and conditions.

<sup>10</sup> Minister of AAND Response to NIRB's Determination with Respect to Baffinland Iron Mines Corporation's Request to Reconsider Terms and Conditions in Project Certificate No. 005 for the Mary River Project. Received April 3, 2013.

that, pursuant to Section 3.5.12 of the NBRLUP, a joint NPC/NIRB review of the proposed development of a transportation corridor associated with the ERP Proposal must be undertaken.

On August 15, 2013 the NIRB indicated its internal review of the FEIS Addendum submitted by Baffinland found that the submission conformed to the Board's EIS Guidelines and that it was therefore initiating a 60 day public technical review period (later extended by 3 days at the request of parties) for interested parties to address the following:

- Determination of whether parties agree/disagree with the conclusions in the FEIS Addendum regarding the alternatives assessment, environmental impacts, proposed mitigation, significance of impacts and monitoring measures – and reasons to support the determination;
- Determination of whether or not conclusions in the FEIS Addendum are supported by the analysis – and reasons to support the determination;
- Determination of whether appropriate methodology was utilized in the FEIS Addendum to develop conclusions – and reasons to support the determination, along with any proposed alternative methodologies which may be more appropriate (if applicable);
- Identification of any terms and conditions contained within the Mary River Project Certificate which may require reconsideration or amendment in light of the ERP Proposal;
- Identification of additional terms and conditions which would be required to address the potential impacts of the ERP Proposal; and
- Any comments, preferences or concerns regarding the location, timing and duration for the NIRB's Public Hearing to be held as a part of its reconsideration process, including identification of potentially-affected communities which should be represented.

Recognizing that the ERP Proposal may potentially affect residents of the North Baffin Region, the NIRB staff facilitated public information meetings in six communities from September 30 to October 7, 2013 to discuss the ERP Proposal and to listen to questions and comments raised by community residents. The communities visited included Igloolik, Hall Beach, Pond Inlet, Arctic Bay, Resolute Bay and Clyde River.<sup>11</sup>

As per the Board's request, on or before October 18, 2013, it received technical review comments regarding Baffinland's FEIS Addendum from the following parties:

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<sup>11</sup> The NIRB released its *Information Session Summary Report* on January 31, 2014.



- Qikiqtani Inuit Association
- Government of Nunavut
- Aboriginal Affairs and Northern Development Canada
- Environment Canada
- Fisheries and Oceans Canada
- Natural Resources Canada
- Transport Canada
- Parks Canada
- Pond Inlet Hunters and Trappers Organization
- Dr. Zacharias Kunuk and Isuma TV
- World Wildlife Fund

On November 15, 2013 Baffinland provided a written response to parties' technical review comments and the NIRB staff facilitated a technical meeting in Iqaluit November 26-28, 2013 for parties to work through salient issues as raised during the commenting period. The technical meeting resulted in a list of commitments to address technical issues, as agreed to by Baffinland and parties in attendance.<sup>12</sup>

The NIRB issued a Notice of Public Hearing to its distribution list for the Mary River project on November 13, 2013, with advertisements appearing in two territorial newspapers by November 21, 2013. The Notice indicated that the NIRB would hold its Hearing in Pond Inlet, January 27-31, 2014. The November 13, 2013 correspondence also invited interested parties to make final written submissions to the Board by January 13, 2014, and provided an application process for parties seeking intervenor status during the Public Hearing, requesting that applications be submitted to the Board on or before December 13, 2013.

On or before December 13, 2013 the NIRB received applications for intervenor status from the the Hamlet of Pond Inlet, the Mittimatalik Hunters and Trappers Organization (MHTO), and Zacharias Kunuk/Isuma TV. The Board granted each applicant intervenor status by way of confirmation sent December 16, 2013, and invited the intervenors to provide final written submissions to the NIRB by January 13, 2014.

The NIRB received final written submissions by the following parties on or before January 13, 2014:

- Qikiqtani Inuit Association
- Hamlet of Pond Inlet
- Mittimatalik Hunters and Trappers Organization
- Government of Nunavut
- Aboriginal Affairs and Northern Development Canada
- Fisheries and Oceans Canada
- Environment Canada
- Natural Resources Canada
- Parks Canada
- Transport Canada

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<sup>12</sup> NIRB, Commitment List from Technical Meeting for the Mary River ERP in Iqaluit, November 29, 2013.

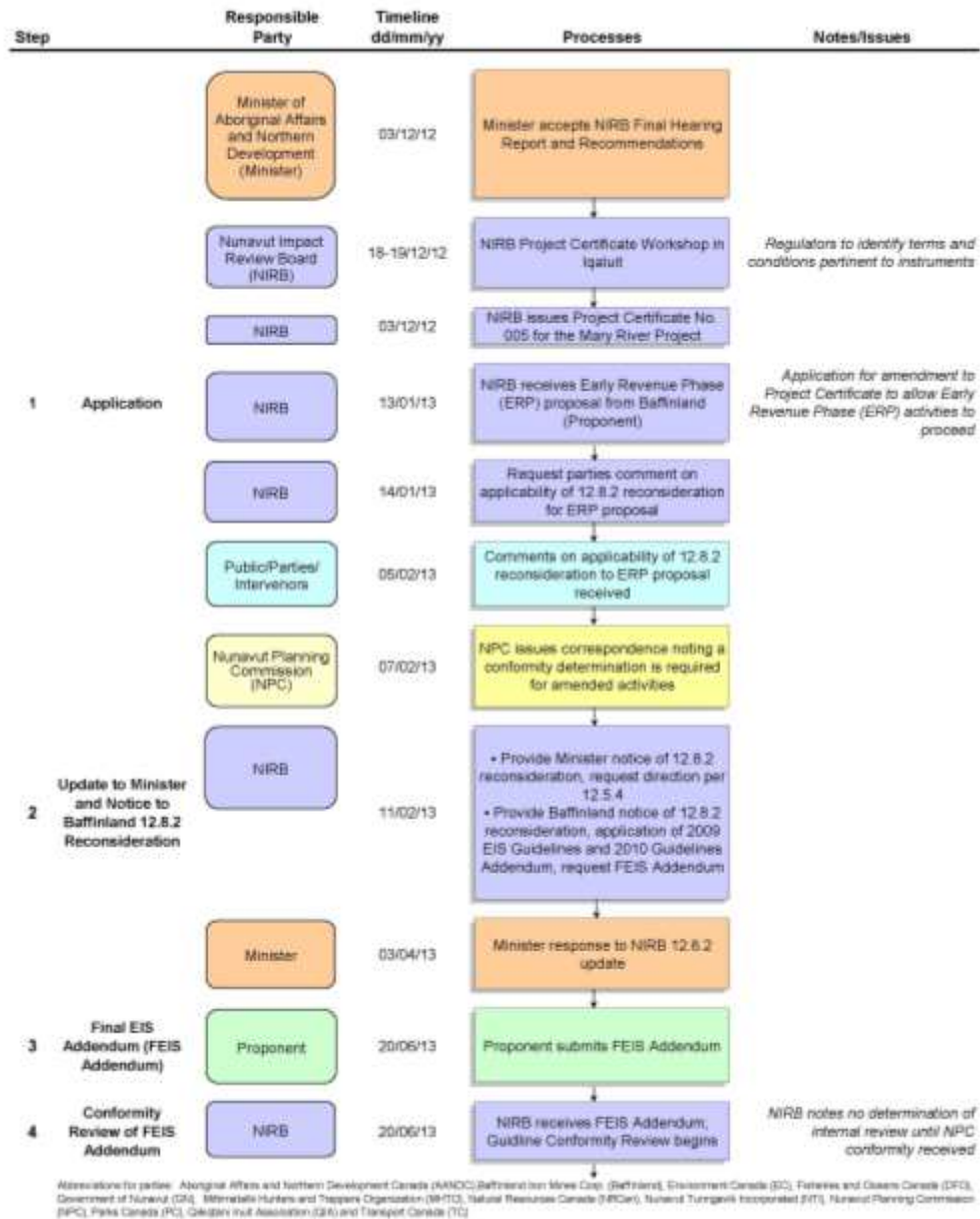
- World Wildlife Fund
- Zacharias Kunuk / Isuma TV
- Elizabeth Inuarak and Gamailie Kilukishak, residents of Pond Inlet

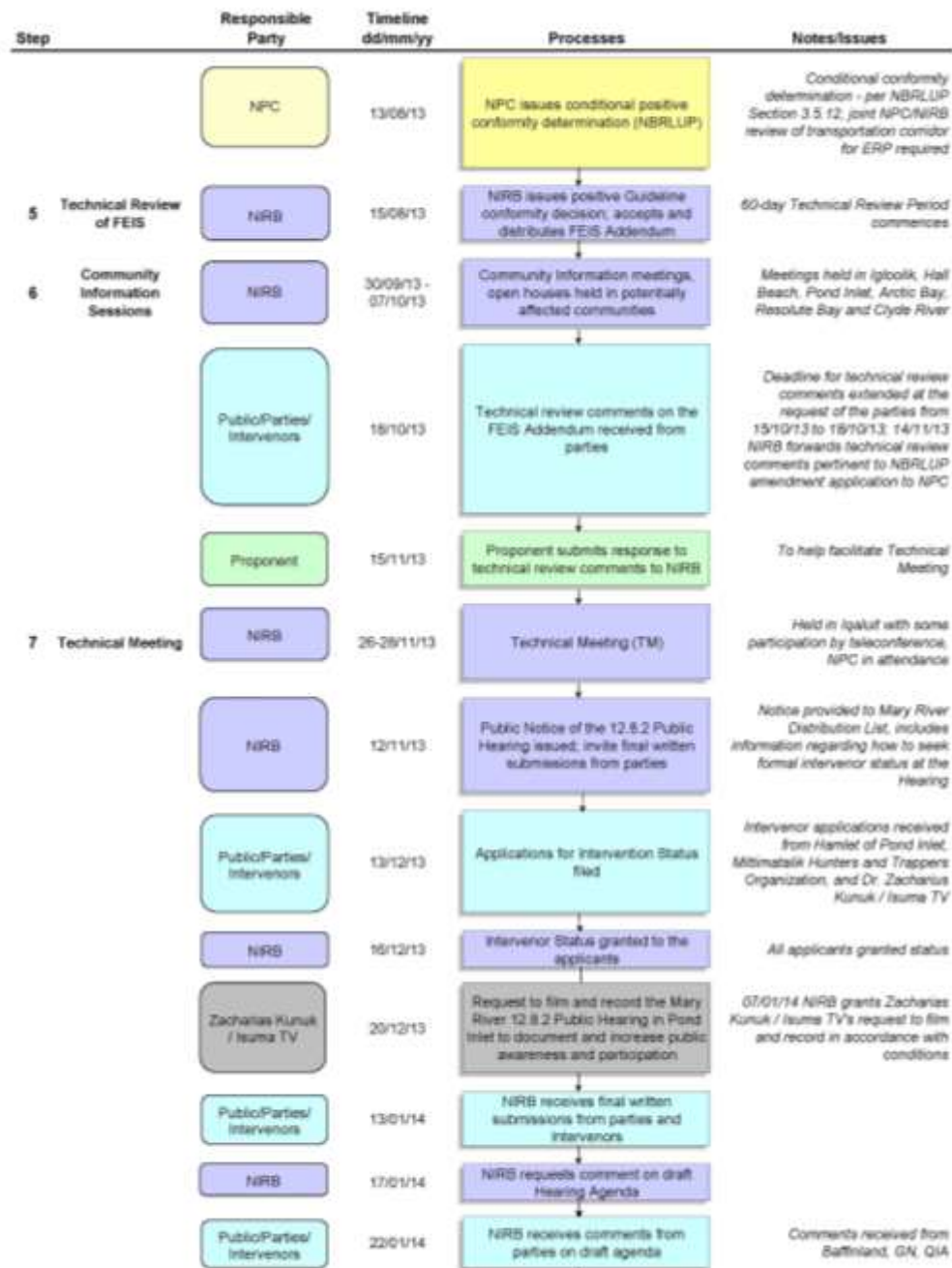
On January 17, 2014 the NIRB circulated a draft agenda for the Public Hearing to its public distribution list and provided parties until January 22, 2014 to provide comments on the ordering and timing of agenda items. Following receipt of comments, on January 23, 2014 the NIRB issued its finalized agenda for the Public Hearing.

The NIRB's Public Hearing for its reconsideration of the Mary River Project Certificate was held January 27-31, 2014 at the Community Hall in Pond Inlet. The proceedings took place from 9:00 a.m. until 5:00 p.m. each day, with three evening sessions also taking place. Technical presentations were made by Baffinland, the NPC, Qikiqtani Inuit Association, federal and territorial authorizing agencies, and registered intervenors during days 1-3 of the proceedings, with community roundtable session discussions taking place over the latter half of the proceedings. The community roundtable sessions were attended by residents of Pond Inlet, as well as up to five invited representatives from each of the communities of Arctic Bay, Igloolik, Hall Beach, Clyde River, Resolute, Grise Fiord and Iqaluit.

At the end of the hearing proceedings on January 31, 2014, the NIRB's Chairperson closed the hearing record, and the Board began its deliberations which have culminated in the development of this report and enclosed recommendations.

Figure 4: Procedural History





Abbreviations for parties: Aboriginal Affairs and Northern Development Canada (AAND), Baffin Region Mines Dept. (Baffind), Environment Canada (EC), Fisheries and Oceans Canada (DFO), Government of Nunavut (GN), Mtitimastik Hunters and Trappers Organization (MHTO), Natural Resources Canada (NRCan), Nunavut Planning Commission (NPC), Nunavut Tunngavik Incorporated (NTI), Parks Canada (PC), Qitijivut Association (QA) and Transport Canada (TC)

Step	Responsible Party	Timeline dd/mm/yy	Processes	Notes/Issues
8	NIRB	23/01/14	NIRB issues finalized Hearing Agenda	issued in English and Inuktitut
	NIRB	31/01/14	Information Session Summary Report issued	
	Public/Parties/ Intervenors	27-31/01/14	Participation in Public Hearing, Technical Sessions and Community Roundtable Sessions in Pond Inlet	Appearances on the record include: Baffinland, NPC, NIT, QIA, GN, AANDC, DFO, EC, NRCan, PC, TC, the Hamlet of Pond Inlet, MHTO, Zacharias Kuhuk, Community Representatives from Grise Fiord, Resolute, Arctic Bay, Clyde River, Hall Beach, Igloolik, Igloodik and Pond Inlet, and members of the public in Pond Inlet.

Abbreviations for parties: Aboriginal Affairs and Northern Development Canada (AANDC), Baffinland Iron Mines Corp. (Baffinland), Environment Canada (EC), Fisheries and Oceans Canada (DFO), Government of Nunavut (GN), Inuit Hunters and Trappers Organization (IHTO), Natural Resources Canada (NRCan), Nunavut Planning Commission (NPC), Nunavut Tunngavik Incorporated (NTI), Parks Canada (PC), Qikiqtaaluk Inuit Association (QIA) and Transport Canada (TC).

## 1.3 Purpose of this Report

This Hearing Report presents the results of the Nunavut Impact Review Board's (NIRB) assessment of Baffinland's Early Revenue Phase proposal and its reconsideration of the terms and conditions within the Mary River Project Certificate in accordance with Section 12.8.2 of the Nunavut Land Claims Agreement (NLCA). It includes the NIRB's conclusions and recommendations to the Minister, reflecting the Board's authority under the NLCA. The Board is satisfied that it has complied with its obligations under the NLCA and that it has sufficient information to draw conclusions and make recommendations regarding the potential effects of the project.

The reporting parameters for the Board's determination are found in section 12.8.3 of the NLCA:

*12.8.3 Where the Minister determines that any of the conditions in Sub-sections 12.8.2(a), (b) or (c) have been established, NIRB shall reconsider the terms and conditions contained in a certificate, and NIRB shall produce a report of its reconsideration.*

## 1.4 Jurisdiction of the Board

The jurisdiction of the Board to conduct this reconsideration of the terms and conditions of Nunavut Impact Review Board (NIRB) Project Certificate No.: 005 is based on the provisions of Article 12, Part 8, Section 12.8.2(b) of the Nunavut Land Claims Agreement (NLCA). Section 12.8.2(b) provides that the NIRB, either on its own or upon application by a Designated Inuit Organization, the Proponent or other interest may reconsider the terms and conditions contained in a Project Certificate if it is established that: "the circumstances relating to the project or the effect of the terms and conditions are significantly different from those anticipated at the time the certificate was issued." On February 11, 2013, in response to the reconsideration request from the Project Proponent, Baffinland Iron Mines Corporation (the Proponent, Baffinland, BIMC), received by the Board on January 13, 2013, the Board determined that:<sup>13</sup>

- the changes to the project schedule in the initial stages of project development and to specific activities proposed under the Early Revenue Phase (ERP) Proposal were integrally linked to the Mary River Project as approved under Project Certificate No.: 005 and any potential ecosystemic and socioeconomic effects associated with these changes would best be addressed under the existing Project Certificate No.: 005;
- the amendments to specific project components and activities under the ERP Proposal were not components and activities which had previously been subject to impact assessment by the

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<sup>13</sup> See the Board's letter to the Honourable John Duncan, then-Minister of Indian and Northern Affairs Canada, dated February 11, 2013 advising of the NIRB's determination that it was appropriate and advisable for the Board to reconsider the Terms and Conditions of Project Certificate No.: 005 under Article 12, Part 8, s. 12.8.2(b) of the NLCA.

Board during the Board's original review of the Mary River Project Proposal and also had not previously been subject to full technical review by the parties, public comment, nor approval by the various responsible authorities; and

- the circumstances (in particular global economic circumstances) relating to the Project in January 2013 when reconsideration was sought were significantly different than the circumstances that existed at the time the Board issued its Final Hearing Report and Recommendations in September 2012<sup>14</sup> and subsequently, when, as directed by the Minister, the Board issued Project Certificate No.: 005 on the basis of the Board's Report and Recommendations in December 2012.

On this basis, the Board commenced the environmental assessment and Project Certificate reconsideration process in February 2013. Although the specific process required to be followed by the NIRB during a reconsideration under s. 12.8.2(b) is not prescribed under the NLCA, as the NIRB advised the Minister, the Proponent and the Qikiqtani Inuit Association in February, 2013, recognizing the requirements of procedural fairness and the expectations of the parties, the Board's assessment and reconsideration process consisted of the following key steps:

- as there were existing Environmental Impact Statement (EIS) Guidelines that had been developed for the assessment of a very similar project alternative (previously called the "Road Haulage Option") the NIRB did not issue new EIS Guidelines and required the Proponent to simply follow the EIS Guidelines applicable to the assessment of the Road Haulage Option;
- the Board requested Baffinland to prepare a comprehensive Addendum to the EIS previously submitted in support of the Review of the full Project to address the potential impacts of the ERP Proposal ;
- the Board undertook a conformity determination comparing the Final Environmental Impact Statement (FEIS) Addendum to EIS Guidelines, and upon indicating that the FEIS Addendum was in conformity, the Board initiated a public technical review period;
- following the technical review period, the Board hosted a meeting of technical experts in Iqaluit in advance of the Public Hearing to streamline and narrow the technical issues remaining outstanding at the Public Hearing;
- the Board conducted a Public Hearing and Community Roundtable to solicit information and perspectives in relation to the assessment of the ERP Proposal and reconsideration of the terms and conditions in Project Certificate No.: 005; and
- following the completion of these steps, the Board, as set out in Article 12, Part 8, section 12.8.3 has prepared this Report for the Minister's consideration to summarize the outcome of the NIRB's assessment of the ERP Proposal and reconsideration of the terms and condition in Project Certificate No.: 005, and if applicable, to make recommendations in relation to amendments and additions to the existing Terms and Conditions of Project Certificate No.: 005.

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<sup>14</sup> NIRB File No.: 08MN053, Final Hearing Report for the Mary River Project, Baffinland Iron Mines Corporation, September 14, 2012.

## **1.5 The Mandate of the Board**

As with all Nunavut Impact Review Board's (NIRB) functions, Article 12, Part 2, section 12.2.5 of the Nunavut Land Claims Agreement (NLCA) requires that:

*In carrying out its functions, the primary objectives of NIRB shall be at all times to protect and promote the existing and future well-being of the residents and communities of the Nunavut Settlement Area, and to protect the ecosystemic integrity of the Nunavut Settlement Area. NIRB shall take into account the well-being of residents of Canada outside the Nunavut Settlement Area.*

In addition to this general requirement, in the context of assessing the Early Revenue Phase (ERP) Proposal and subsequently reconsidering the terms and conditions of Project Certificate No.: 005, the function of the Board is to gauge and define the extent of the potential impacts of the ERP, including assessing the likely ecosystemic and socio-economic impacts of the ERP. On the basis of this assessment, the Board will then determine if the ERP should proceed, and if so, the Board will determine what terms and conditions are required to be revised or added under Project Certificate No.: 005 to address the anticipated impacts.

## **1.6 Evidentiary Issues**

### **1.6.1 The Burden and Standard of Proof**

During the Nunavut Impact Review Board's (NIRB or Board) decision-making process, the burden of persuading the Board that the Early Revenue Phase (ERP) Proposal, can proceed rests with the Proponent. The community, Elders and Intervenors do not have the onus of persuading the Board that the Proponent has not satisfactorily assessed the anticipated ecosystemic or socio-economic impacts and environmental effects of the ERP, or that the proposed revisions to Project Certificate No.: 005 required to avoid and mitigate or compensate for adverse impacts are insufficient. Rather, it is the responsibility of the Proponent, who has requested the Board to assess the ERP Proposal and reconsider the terms and conditions of Project Certificate No.: 005 in light of the ERP to prepare a Final Environmental Impact Statement Addendum that fully reflects the NIRB-issued guidelines and that provides the Board with the information necessary to assess the ecosystemic and socio-economic impacts of the ERP.

In the context of the Public Hearing associated with the Board's consideration of the ERP Proposal, the standard of proof required the Board to carefully balance all of the written evidence filed in advance and at the Public Hearing, as well as evidence provided by the participants at the Public Hearing. Throughout the decision-making process, the onus remains on the Proponent to demonstrate that allowing the ERP Proposal to proceed in accordance with specific terms and conditions is consistent with the Board's mandate and requirements of the Nunavut Land Claims Agreement.



## 1.6.2 The Precautionary Principle and Adaptive Management

As was the case in the Board's previous assessment of the Mary River Project Proposal, the Board recognizes that there are areas of the Early Revenue Phase (ERP) Proposal for which there may be substantial gaps in data or uncertainty regarding predicted effects. In such cases, the Board is guided by the "precautionary principle", which essentially means that a lack of scientific certainty regarding effects will not be an excuse for inaction.<sup>15</sup> In practice, when the precautionary principle applies, as is the case here with respect to some predicted effects, it is the Proponent who bears the burden of proof to show that despite the uncertainty, the potential adverse environmental impacts can be mitigated or reversed.

Closely linked to the precautionary principle is the use of "adaptive management" in an effort to address the potential for adverse impacts to result that were not identified or fully understood at the time a project is assessed. As defined by the Board in the Board's previous assessment of the Mary River Project Proposal:

*Adaptive management is an ongoing process of decision-making that involves making initial decisions based on the existing data, subsequently monitoring for potential effects, assessing the effectiveness of the initial decisions (including assessing the effectiveness of mitigation measures) and then adjusting actions going forward to reflect the monitoring data and the effectiveness of measures taken to minimize adverse effects. Adaptive management provides the basis for sound environmental decision-making even in the face of uncertainty surrounding the nature and extent of effects that is often inherent at the environmental assessment stage.<sup>16</sup>*

The implementation of adaptive management is both consistent with, and supported by, the Nunavut Impact Review Board's (NIRB) project monitoring jurisdiction as set out in Part 7 of Article 12 of the Nunavut Land Claims Agreement (NLCA). An adaptive management approach is also inherent in the express jurisdiction of the Board to reconsider the terms and conditions in previously issued project certificates under Part 8 of Article 12 of the NLCA to ensure that terms and conditions continue to meet the Board's objectives throughout the project lifecycle and accurately reflect current circumstances.

As noted previously by the Board, the precautionary principle is not a static or fixed concept and is expressed in various forms. Recent environmental assessments in other jurisdictions and the Board's decision for the Approved Project indicate that in certain circumstances a more stringent version of the precautionary principles should be applied. The more rigorous version of the precautionary principle

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<sup>15</sup> For a more complete discussion of the concept of the precautionary principle as applied to the Mary River Project Proposal see, NIRB File No.: 08MN053, Final Hearing Report for the Mary River Project, Baffinland Iron Mines Corporation, September 14, 2012 at pp. 11-13.

<sup>16</sup> NIRB File No.: 08MN053, Final Hearing Report for the Mary River Project, Baffinland Iron Mines Corporation, September 14, 2012 at p. 11.

requires more than using uncertainty to avoid taking action, it actually compels **positive** action where there is serious risk of environmental degradation and high levels of uncertainty by requiring monitoring for and mitigation of potential adverse effects before such impacts actually occur. This vision of the precautionary principle ensures that there is a “safety margin” built into monitoring and mitigation measures, thresholds and the adaptive responses. In this way, where the monitoring and adaptive management mechanisms expected to be deployed if potential adverse effects are noted are designed to be proportional to the risk (i.e. the higher the risk of significant adverse impacts the more extensive the required monitoring and mitigation measures).

In the NIRB’s reconsideration of Project Certificate No.: 005, the NIRB identified whether a heightened approach to the precautionary principle and adaptive management was necessary on the basis of the following considerations:

- (i) the seriousness or reversibility of potential adverse impacts;
- (ii) the likelihood that should the impacts occur they could be mitigated or reversed;
- (iii) the jurisdictional authority of the NIRB; and
- (iv) public concern.

Where the Board’s consideration of the four factors outlined in the paragraph above, support the application of a more stringent approach to the precautionary principle and adaptive management, in order to maintain the ecosystemic integrity of the Nunavut Settlement Area, the Board has provided a brief summary statement indicating that a more stringent approach is being applied.

### **1.6.3 Inuit Qaujimaningit**

As indicated in both the Environmental Impact Statement (EIS) Guidelines and the Nunavut Impact Review Board’s (NIRB or Board) previous decisions, in the Board’s view, Inuit Qaujimaningit (IQ), which encompasses Inuit Traditional Knowledge (TK) (and variations thereof) as well as contemporary Inuit knowledge that reflects Inuit societal values and experience, contributes vital information to the NIRB’s review process. The term IQ is meant to encompass local and community-based knowledge, ecological knowledge (both traditional and contemporary), which is rooted in the daily life of Inuit people and represents experience acquired over thousands of years of direct human contact with the environment.<sup>17</sup> With its emphasis on personal observation, collective experience and oral transmission over many generations, IQ provides factual information on such matters as ecosystem function, social and economic well-being, and explanations of these facts and casual relations among them. In this regard, IQ has played a significant role in this Review by: contributing to the development of accurate baseline information; comparing predictions of effects with past experience; and assisting in the assessment of the magnitude of projected effects.

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<sup>17</sup> Berkes, F. 1993. Traditional Ecological Knowledge in Perspective. In: Inglis, J. (ed.), Traditional Ecological Knowledge: Concepts and Cases. Ottawa: Canadian Museum of Nature, pp. 1-9.

The Proponent was required to incorporate IQ into the Addendum to the Final Environmental Impact Statement (FEIS), to the extent that the Proponent had access to such information and in keeping with the expectation that the Proponent would undertake appropriate due diligence to gain access to the information but may be limited by obligations of confidentiality and other ethical obligations that may attach to such information. In addition to IQ provided as part of the FEIS and FEIS Addendum or in questions or responses provided by the intervenors, during the approximately two and a half days of Community Roundtables at the Public Hearing, Elders, Inuit harvesters and other community members freely shared their extensive IQ with the Board.<sup>18</sup> The NIRB has benefitted immensely from the IQ provided in the FEIS Addendum and shared with us by the participants at the Public Hearing and the Board has considered and incorporated this information throughout the report and recommendations.

## **1.7 Scope of NIRB's Assessment and Environmental Impact Statement Guidelines**

On January 13, 2013 the NIRB received correspondence from Baffinland which indicated that, due to various business drivers, Baffinland was proposing to make changes to the schedule and specific activities in the initial stages of project development associated with the Mary River Project. The proposal involved incorporating an "Early Revenue Phase" into the development plans for the Mary River Project, and as set out by Baffinland, would involve the proposed amendment of specific project components and activities which had not previously been subject to impact assessment by the Board during its Review of the Mary River Project, nor to the subsequent approval processes of various responsible authorities. Baffinland noted its understanding that the Project amendment request (the Early Revenue Phase or ERP Proposal) may necessitate a reconsideration of the Terms and Conditions contained within Project Certificate No.: 005 as issued by the NIRB for the Mary River Project pursuant to NLCA Section 12.8.2.

On January 14, 2013 the NIRB requested that interested parties review a description of Baffinland's ERP Proposal and provide comments to the NIRB

After considering the information provided by the Proponent, comments submitted by parties and options available pursuant to the NLCA, the NIRB determined that a reconsideration of the Terms and Conditions contained within Project Certificate No.: 005 was warranted, pursuant to NLCA 12.8.2(b) which states:

*12.8.2 NIRB may on its own account or upon application by a DIO, the proponent, or other interests, reconsider the terms and conditions contained in the NIRB certificate if it is established that:*

*(b) the circumstances relating to the project or the effect of the terms and conditions are significantly different from those anticipated at the time the certificate was issued*

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<sup>18</sup> See for example NIRB Public Hearing File No.: 08MN053 Transcript, January 29, 2014, starting at p. 607, January 30, 2014, starting at p. 751 and January 31, 2014, starting at p. 995.

In order to facilitate the Board's assessment of the environmental and socio-economic impacts associated with the ERP Proposal, Baffinland was requested to prepare a comprehensive addendum to the Mary River FEIS describing all aspects of the ERP Proposal, including updates to relevant baseline data, impact predictions and proposed mitigation measures and monitoring plans. The Board further noted that Baffinland's Addendum to the FEIS must meet relevant criteria as set out in the NIRB's EIS Guidelines and subsequent Addendum to EIS Guidelines as issued to Baffinland for the Mary River Project on November 16, 2009 and November 10, 2010<sup>19</sup>, respectively.

On June 20, 2013 the NIRB acknowledged receipt of Baffinland's Addendum to the FEIS submission for the ERP Proposal and initiated an internal review of the submission to determine whether or not it conformed to the EIS Guidelines issued to Baffinland by the NIRB. The Board noted that it would not complete its internal review until a conformity determination had been received from the NPC. On August 13, 2013 the NIRB received a conditional conformity determination from the NPC which advised that, pursuant to Section 3.5.12 of the NBRLUP, a joint NPC/NIRB review of the proposed development of a transportation corridor associated with the ERP Proposal must be undertaken.

On August 15, 2013 the NIRB indicated its internal review of the FEIS Addendum submitted by Baffinland found that the submission conformed to the Board's EIS Guidelines and that it was therefore initiating a 60 day public technical review period

- as there were existing Environmental Impact Statement (EIS) Guidelines that had been developed for the assessment of a very similar project alternative (previously called the "Road Haulage Option") the NIRB did not issue new EIS Guidelines and required the Proponent to simply follow the EIS Guidelines applicable to the assessment of the Road Haulage Option;
- the Board requested Baffinland to prepare a comprehensive Addendum to the EIS previously submitted in support of the Review of the full Project to address the potential impacts of the ;
- the Board undertook a conformity determination comparing the Final Environmental Impact Statement (FEIS) Addendum to EIS Guidelines, and upon indicating that the FEIS Addendum was in conformity, the Board initiated a public technical review period;

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<sup>19</sup> The Addendum to the original EIS Guidelines were issued to Baffinland by the NIRB in 2010 in order to address the Proponent's "Road Haulage Option" alternative as presented at the time. The Board determined that the "Road Haulage Option" was closely aligned with the ERP amendment request, and that the November 2010 Addendum to the EIS Guidelines would provide sufficient direction for the Proponent to prepare materials that would facilitate the NIRB's Reconsideration of the Mary River Project Certificate terms and conditions.

## **1.8 Key Issues**

On November 26-29, 2013, following technical meetings held in Iqaluit to prepare for the Public Hearing, the Nunavut Impact Review Board (NIRB or the Board) identified that in addition to particular issues raised by the submissions of the parties, the following key technical issues were likely to warrant focused discussion during the Mary River Early Revenue Phase (ERP) Proposal Public Hearing:

- Adequacy of marine baseline information and proposed monitoring and adaptive management plans;
- Management of ballast water, including regulatory role in oversight/enforcement, potential for introduction of invasive species, and potential cumulative impacts to marine water quality, habitat and food chain/web dynamics;
- Potential impacts to marine mammals and Inuit harvesting, including movement through the marine environment, resulting from proposed open water shipping and associated noise and wake effects;
- Potential direct and indirect socio-economic impacts, including impacts to education and training opportunities, capacity of current services to meet future need and traditional land use; and,
- Other issues as raised by parties and intervenors.

At the Public Hearing it was also noted that the following additional key issues were the subject of discussion by parties, intervenors and community representatives:

- The need for definition and extent of operational flexibility requested by the Proponent;
- Temporal scale of the ERP Proposal to extend throughout the life of the mine;
- Potential for the ERP to affect the likelihood of Baffinland proceeding with the already approved Mary River Project Proposal;
- Potential for the ERP to strain government capacity in respect to emergency response, housing, health care including mental health support services, education, child care and transportation infrastructure such as airports and docks;
- Potential for mine training, education and certifications to be transferred to other settings;
- Potential for impacts on youth (including increasing drop out rates, greater exposure to drugs and alcohol, decreased time and incentive to practice traditional skills, etc.); and
- Availability of community support networks, not just for workers at the mine site, but also for their families to address the stressors resulting from the rotational work schedule associated with the ERP of two weeks in and two weeks out.

## **1.9 Inuit Harvesting Rights under the NLCA, Project Certificate and Inuit Impact Benefit Agreement**

In advance of the Public Hearing, the Qikiqtani Inuit Association (QIA) sent correspondence to the Nunavut Impact Review Board (NIRB or the Board) querying whether the provisions in Conditions 62 and 124 of Project Certificate No.: 005<sup>20</sup> were in conflict with the hunting rights of Inuit employees incorporated into Article 11 of the Inuit Impact Benefit Agreement (IIBA).<sup>21</sup> In this correspondence, the QIA asked the Board to determine whether there was a conflict of the IIBA hunting rights of Inuit employees with the current wording of Conditions 62 and 124 of Project Certificate No.: 005.

Subsequently, the QIA also addressed remarks to this issue during the Public Hearing<sup>22</sup> and questions on this issue were also raised by the Mittimatalik Hunters and Trappers Organization<sup>23</sup> and in the Community Roundtable sessions.<sup>24</sup>

The Board recognizes that the rights of Inuit harvesters in Nunavut generally and in project areas are granted and modified by a number of key provisions of the Nunavut Land Claims Agreement (NLCA), including the following:

***Right of Access by Inuit***

*5.7.16 Subject to Section 5.7.18, all Inuit shall have the free and unrestricted right of access for the purpose of harvesting to all lands, water and marine areas within the Nunavut Settlement Area, except the lands described in Section 5.7.17, and without limiting the generality of the foregoing, the said right of access shall extend to all Crown lands, including, for greater certainty, Parks and Conservation Areas, and, to all lands vested in a municipal corporation.*

***Lands Not Subject to Right of Access***

*5.7.18 The right of access granted by Section 5.7.16 is subject to:*

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<sup>20</sup> **Term and Condition #62** reads as follows:

The Proponent shall prohibit project employees from transporting firearms to site and from operating firearms in project areas for the purpose of wildlife harvesting.

**Term and Condition #124** reads as follows:

The Proponent shall prohibit project employees from recreational boating, fishing, and harvesting of marine wildlife in project areas, including Steensby Inlet and Milne Inlet. The Proponent is not directed to interfere with harvesting by the public in or near project areas, however, enforcement of a general prohibition on harvesting in project areas by project employees during periods of active employment (i.e. while on site and between work shifts) is required.

<sup>21</sup> Exhibit 10, NIRB Public Hearing File No.: 08MN053, January 29, 2014 filed by Qikiqtani Inuit Association, Correspondence to R. Barry, NIRB from QIA Re: A Review of Project Certificate No.: 005 Conformity with IIBA Hunting Rights, dated January 10, 2014.

<sup>22</sup> S. Williamson Bathory, Qikiqtani Inuit Association, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, pp. 359-362, lines 20-26, lines 1-26, lines 1-26 and lines 1-21.

<sup>23</sup> J. Pitseolak, Mittimatalik Hunters and Trappers Organization, NIRB Public Hearing File No.: 08MN053 Transcript, January 29, 2014, pp. 569-571, lines 19-26, lines 1-26 and lines 1-5.

<sup>24</sup> See for example, C. Sangoya, Pond Inlet Mary River Project Committee, NIRB Public Hearing File No.: 08MN053 Transcript, January 30, 2014, p. 759, lines 14-24.

- (a) laws of general application enacted for the purpose of public safety; ...*
- (d) any land use activity which has been authorized in accordance with any applicable requirements, including Articles 11 and 12, to the extent that the right of access is incompatible with that land use activity and for only as long as is necessary to permit that land use to be exercised.*

***Restrictions on Right of Access and Harvesting***

*5.7.23 Any term of contract that attempts to limit rights of access of or harvesting by an Inuk during the leisure hours of that employee shall be null and void against Inuit.*

As expressly noted by the Board in Section 3.2 of Project Certificate No.: 005, all terms and conditions of the Project Certificate must be interpreted in the proper context:

*In order to view the project-specific terms and conditions set out within this Project Certificate in the appropriate context, the following general principles of interpretation apply to the Project Certificate in its entirety, with all terms and conditions being interpreted in accordance with:*

...

- b. The rights, responsibilities, authorities and jurisdiction granted under the Nunavut Land Claims Agreement (NLCA);*
- c. The limits and obligations imposed under laws of general application applicable to the Proponent or any party referred to in the term and condition, as those laws may be amended over time (e.g. privacy legislation, worker's health and safety, etc.);*
- d. The specific jurisdictional and policy limits applicable to authorizing agencies, Nunavut Tunngavik Incorporated, the Qikiqtani Inuit Association, or other regulatory authority with jurisdiction in respect of the Project;*

The Board also notes that when reading together the terms and conditions of the Project Certificate and the provisions of the IIBA Article 26, Part 3, Section 26.3.2 of the NLCA establishes that:

*26.3.2 An IIBA shall be consistent with the terms and conditions of project approval, including those terms and conditions established pursuant to any ecosystemic and socio-economic impact review.*

It is the Board's view that when viewed in the proper context with the full appreciation of the rights and obligations under the NLCA and recognizing that the Minister of Aboriginal Affairs and Northern Development has approved both the issuance of the Project Certificate terms and conditions and ratification of the IIBA, that the terms and conditions in the Project Certificate and the IIBA can be read together without conflict. The Board recognizes, however, that the Board's views on this issue are not determinative, as the Minister is the ultimate decision-maker with respect to the appropriateness of specific terms and conditions in a Project Certificate in any given case.

Further, the Board recognizes that under Article 12, Part 8, section 12.8.2 of the NLCA if the QIA, the Proponent or other party determines that any terms and conditions are not achieving their purpose or

that the effect of the terms and conditions are significantly different from those anticipated at the time the certificate was issued they may request the Board to reconsider the relevant terms and conditions.



## 2. PROJECT SETTING AND DESCRIPTION<sup>25</sup>

### 2.1 Project Setting

#### 2.1.1 Site Features

The Early Revenue Phase (ERP) Proposal is designed to occur within the project development area identified for the approved Mary River Project, and therefore necessarily shares the same site features as those identified for the Mary River Project. Where appropriate, a focus on the site features specific to those areas more directly affected by the ERP Proposal than the larger approved Mary River Project has been provided below.

The landforms and the iron ore deposits in the Mary River Project area are associated with widespread past and current glaciation on Baffin Island. The Mary River iron deposits are located within the Mary River Group, an assemblage of Late-Archean metasedimentary to metavolcanic rocks that have been folded and preserved in greenstone belts. The Mary River Group greenstone belts are present as fragmented remnants stretching from Bylot Island south to Ege Bay, with a maximum thickness of 4,000 metres (m). The high-grade iron ore at Deposits No. 1, 2, 3 and 4 were discovered in 1962, and these initial hematite-magnetite mineralized zones were mapped out within extensive belts of banded iron formation in the area over the next three years. As typified at Deposit No. 1, the high-grade iron formations are inter-layered with thin bands of chlorite-actinolite schist, staurolite-garnet-mica schist and banded iron formation across their strike width, with the entire assemblage up to 400 m-thick. The mining lease over the proposed mine site predated the establishment of Nunavut under the Nunavut Land Claims Agreement (NLCA).<sup>26</sup>

Surface geology consists of locally abundant sediment deposits from glaciers and rivers. The Mary River mine site area is located in a major glaciofluvial outwash deposit in what appears to be a classic “U” shaped valley. In addition to the glaciofluvial deposits, there appears to be some direct glacial deposition consisting of kames, moraines, and eskers in and around the southeastern portion of Sheardown Lake.

The dominant landforms and deposition features in the Milne Inlet area are typically of glacial activity, marine and mechanical forms in various degrees. Glacial activity is not overly apparent on the immediate site but is more pronounced in the higher elevations south of the site. Marine and mechanical features are most predominant with terraces and strand (beach) lines formed by marine action which have been cut by mechanical features, some of which may be attributed to permafrost. Wind appears to have been responsible for some drifting on the finer grained soils on the lower part of

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<sup>25</sup> Unless otherwise stated, the Project Setting and Description is based on the information provided by the Proponent in the Project Proposal submitted to the NIRB on March 20, 2008 and Final Environmental Impact Statement (FEIS) Addendum submitted to the NIRB on June 20, 2013.

<sup>26</sup> FEIS Addendum, Volume 1, Section 15.1.

the site. Recently deposited colluvium is present on many of the slopes and side hills in the area. The action of surface water has produced numerous sharp gullies along water-ways. Marine clays were also noted at some locations at the site.

The Mary River Project and associated ERP Proposal are located in a zone of continuous permafrost. The active layer through the project area typically ranges from approximately 1 to 2 m but may be greater in areas where there is loose, sandy soil at the edges of lakes or ponds and less in areas with significant layer of wet organics at surface. Unfrozen zones termed “taliks” can exist within areas of continuous permafrost below lakes, under major rivers or near the coast.

All streams with the possible exception of large rivers freeze solid in winter. Lakes provide the only overwintering habitat for the two fish species, land-locked arctic char and nine-spined stickleback. Lakes also provide spawning habitat for arctic char across the study areas. Many streams provide rearing and foraging habitat and potential protection from predators for juvenile arctic char. Most of the drainage basins that support arctic char either contain barriers preventing fish migrations from the rivers into the oceans, and/or are distant from the coast, and most populations in the five study areas are land-locked. Nearshore zones of larger lakes also provide rearing and foraging habitat and potential protection from predators for juvenile arctic char, foraging and, in some cases, spawning habitat for adult arctic char, and overwintering habitat for all life stages.

As is typical of Arctic ecosystems, the freshwater environment in the Mary River Project area is relatively nutrient-poor and primary productivity is relatively low. In general, Arctic freshwater ecosystems are characterized by relatively low diversity of zooplankton communities due to low temperatures and nutrients. The benthic invertebrate communities in the Mary River Project area are generally moderately diverse, although higher diversity is found in some small tributaries, and are dominated by chironomids (midges). The Milne Inlet Tote Road crosses a large number of watercourses and a portion of these contain fish habitat. Fish in the marine waters at Milne Inlet include arctic char, sculpin and Greenland cod.

Plant life is relatively sparse in much of the Mary River Project area and is generally consistent with the plants that usually occur in arctic regions. Vegetation of the study areas are generally consistent with flora of Arctic regions; short plant heights growing on rocky, sandy or silt soils of low nutrient content.

While some populations of caribou migrate between preferred habitats in summer and winter, North Baffin caribou appear to be non-migratory and are likely to be found relatively equally in many locations throughout the Mary River Project area. Migratory bird species observed in the Mary River Project area include snow geese, ducks, eiders, loons, and mergansers. Raptors found include rough-legged hawks, peregrine falcons, gyrfalcons, and snowy owls.

The marine physical environment varies across the Mary River Project area. Milne Inlet is comprised of a fjord system having water depths reaching over 800 m with depths commonly between 150 m and 300 m. Closer to the proposed Milne Port location is a characteristic U-shaped cross-sectional profile common to fjords that has a maximum water depth of approximately 150 m.

## 2.1.2 Biophysical Conditions

The Early Revenue Phase (ERP) Proposal is designed to occur within the project development area identified for the approved Mary River Project, and therefore necessarily shares the same biophysical conditions as those identified for the Mary River Project. Where appropriate, a focus on biophysical conditions specific to areas more directly affected by the ERP Proposal than the larger approved Mary River Project has been provided below.

The North Baffin region containing the Mary River Project area lies within the Committee Belt, a granite-greenstone terrain mixed with sedimentary and volcanic rock. Occasional outcrops of granitic and sedimentary rock formations occur. The mountains to the east are older than 540 million years old, and the lowland plateaus to the west are about 250 to 540 million years old.

The climate is semi-arid and permafrost coverage is continuous extending to a depth of 500 m, with an active layer of up to 2 m. The extremely cold temperatures of the region, combined with the permafrost, result in a short period of runoff that typically occurs from June to September. All rivers and creeks, with the exception of the very largest systems, freeze completely during the winter months. Due to the combination of low temperatures and the low capacity of the soil to hold moisture, vegetation is minimal and surface water is abundant. The region is dotted with thousands of small lakes and streams.

The region experiences near 24-hour darkness with less than two hours of twilight from November to January. During the winter months, the treeless topography and fine powdery snow produce blowing snow conditions, resulting in restricted visibility. There is continuous daylight from May to August and frost-free conditions occur from late June to late August. The months of July and August usually experience the greatest precipitation. From September to November, temperature and the number of daylight hours decrease, and by mid-October the mean daily temperature is generally well below 0°C. The highest snowfall typically occurs during this period. Air quality is very good, as would be expected in a pristine environment, and noise levels are low in the proposed Project area as is typical of a remote environment.

The coastal habitat of Milne Inlet is typical of a periglacial coastal environment where most of the shoreline is dominated by either rock or coarse sediment beaches comprised of poorly sorted boulder, cobble, pebble, and sand. A limited open-water season and the coarse nature of the shoreline results in complex, poorly organized shoreline morphology. The presence of sea ice limits the development of intertidal biota, although rockweed was commonly observed along the shore.

Streams within the Mary River Project area typically have naturally elevated concentrations of dissolved oxygen, turbidity, aluminum and iron. Some average values for pH exceeded the Canadian Council of Ministers of the Environment (CCME) guidelines as did average values for cadmium and mercury at most sites. Selenium routinely was reported at the CCME guideline. When all areas for stream sampling were compared based on Water Quality Index values, the sampling locations within the area between Camp Lake and Milne Port indicated the highest value of 99.5, or “excellent” water quality.

Lakes within the Mary River Project area generally undergo vertical thermal stratification in late July and early August. In late August and early September the lakes undergo uniform mixing of the water

column. Average values for pH exceed the CCME range of 6.5 to 8.5 for lakes within the proposed mine site area (Mary Lake, Camp Lake and Sheardown Lake). Cadmium and Mercury are at or above CCME guidelines in some lakes.

The streambeds are typically dominated by cobbles and boulders. Sediment quality at stream and lake sites across the project area were generally good with naturally higher levels of chromium, copper and, to a lesser extent, arsenic, cadmium, mercury, lead and zinc.

The water composition from Milne Inlet reflects those typical of marine waters (e.g., chloride, sodium, sulphate, magnesium, etc.). Several metals (including cadmium and iron) are present in low concentrations and are generally below the analytical level of detection.

A total of 146 benthic infauna species were identified from Milne Inlet. *Polychaetes* and *ostracods* were the most abundant taxa in Milne Inlet, although copepods, amphipods and several species of bivalves were also common. As reported in previous studies of the Canadian Arctic, the abundance and community composition of benthic infauna in Milne Inlet varies with depth.

The nearshore marine fish community in the vicinity of the Milne Port is characterized by low species diversity and abundance. Arctic char, fourhorn sculpin, shorthorn sculpin, Arctic staghorn sculpin, and Greenland cod were captured during the experimental gillnetting program, with sculpin species accounting for 80% of the catch. Muscle samples collected from the arctic char catch contained an average mercury concentration below the Health Canada commercial export limit of 0.5 micrograms per gram. Although few arctic char were captured at the proposed Milne Port site, the nearby Tugaat and Robertson Rivers support anadromous (migratory) char populations.

Terrestrial mammals in the region include barren-ground caribou of the North Baffin herd, wolf, arctic and red fox, ermine, arctic hare, and lemmings. Marine mammals are found in abundance in the region, including polar bears, narwhals, beluga whales, bowhead whales, several species of seals, and walrus. Killer whales and northern bottlenose whales were found in small numbers.

North Baffin caribou are currently present at low densities and their numbers seem to vary in accordance with a 60 to 70 year cycle. The last period of caribou abundance in the area was 1980 to 2000, and the previous period of low abundance was in the 1940s. Caribou are expected to remain at low numbers for the next couple of decades. However, there is evidence that caribou do occur throughout the entire region.

Relatively low densities of songbirds and shorebirds were recorded throughout the region. There are also numerous sea birds in the area of the shipping route including thick billed murres and many types of gulls. There are two fish species in the freshwater environment: arctic char and a minnow species named nine-spine stickleback.

In total twenty-two marine mammal species are known or expected to occur in the Regional Study Area (RSA) identified in the Final Environmental Impact Statement Addendum for the ERP Proposal, including the proposed shipping routes in Baffin Bay and Davis Strait. Species accounts are provided for all species; however, emphasis is placed on species which regularly occur within the RSA. Only one mysticete or baleen whale species, the bowhead whale (*Balaena mysticetus*), occurs regularly in the

RSA. Narwhal (*Monodon monoceros*) and beluga (*Delphinapterus leucas*) are abundant in the RSA; other Odontocetes that occur (albeit in low numbers) in the RSA include killer whales (*Orcinus orca*) and northern bottlenose whales (*Hyperoodon ampullatus*). Pinniped species which occur regularly in the RSA include ringed seal (*Pusa hispida*), bearded seal (*Erignathus barbatus*), and walrus (*Odobenus rosmarus*). Polar bears (*Ursus maritimus*) also occur throughout the RSA.

### **2.1.3 Socioeconomic Conditions**

The Early Revenue Phase (ERP) Proposal is designed to occur within the project development area identified for the approved Mary River Project, and therefore necessarily shares the same socioeconomic conditions as those identified for the Mary River Project. Where appropriate, a focus on socioeconomic conditions specific to those communities and areas more directly affected by the ERP Proposal than the larger approved Mary River Project has been provided below.

The Baffin Region of Nunavut has a rich and visible archaeological heritage dating back many thousands of years. There are many archeological sites both small and more significant, particularly around Milne Port and Milne Inlet Tote Road.

The five North Baffin communities in the immediate vicinity of the proposed ERP are Arctic Bay (280 km), Clyde River (415 km), Hall Beach (192 km), Igloolik (155 km), and Pond Inlet (160 km). Each of these communities has long term social, economic and environmental ties to the proposed ERP area. For many of these North Baffin households, harvest of country food provides an important contribution to their overall well-being, both physical and cultural. In all five communities, caribou, ringed seal, and arctic char are of major importance. In addition, walrus is a significant species in Hall Beach and Igloolik, while narwhal is a key component of the harvest among households in Arctic Bay, Pond Inlet, and to a lesser degree, Clyde River.

The rate of subsidy that is effectively applied to country food harvests equates to between one-tenth to one-fifth of the subsidy rate applied to southern foods transported for sale in the North Baffin region. On this basis, harvesting from the land and sea is estimated to produce food worth between \$12 million and \$20 million per year in this region. The amount of work to harvest this food is estimated to be 350 full-time jobs.

The population of the North Baffin region are mostly Inuit (94 %), with non-Inuit accounting for just 6% of the population. The proportion of Inuit and non-Inuit in Iqaluit differs markedly, with 60% of the population being Inuit and 40% non-Inuit. While the Inuit population has a very young age profile, nearly all non-Inuit residents in North Baffin are of working age. In Iqaluit, 58 % of the population - 66% of the male population - age 40 to 64 are non-Inuit. Non-Inuit men make up the majority of Iqaluit's male population aged 25 to 39. The demographic data suggest non-Inuit residents move to the communities primarily to work and that relatively few are raising families or living out their retirement years in these communities.

The Inuktitut language is prevalent in North Baffin communities. Nearly all Inuit residents of the North Baffin learn Inuktitut as their mother tongue, and for 9-in-10 residents, Inuktitut is the language most

commonly spoken at home. A portion of the population, ranging from 6% in Hall Beach to 24% in Igloolik, consists of unilingual Inuktitut speakers. In North Baffin, nearly 2-in-3 Inuit work in settings where Inuktitut is the prevalent language.

The linguistic picture in Iqaluit is dramatically different from that of North Baffin. In the capital, slightly more than one-fifth of the Inuit population did not learn Inuktitut as their mother tongue and fewer than half speak Inuktitut at home. Only 20% of Inuit in Iqaluit speak Inuktitut in the workplace, and only 3% are unilingual Inuktitut speakers.

In addition to the \$12-20 million in-kind income generated for North Baffin households through harvest activities in the land-based economy, residents gain monetary income through employment and various social transfers. In 2007, personal income reported by residents of the five North Baffin communities was \$83 million, and income reported by Iqaluit residents was \$196 million. Among the resident Inuit population, earned income accounts for between 70% (Clyde River) and 81% (Pond Inlet) of total income. Most of the remaining income, ranging from 17% (Pond Inlet) to 27% (Clyde River) is derived from government transfers. Other income, such as that from investments, accounts for less than 3% of total income. In Iqaluit, the role of government transfers is much lower than in North Baffin communities, accounting for only 8% of the total income of the Inuit population of the city.

The public sector accounts for a large portion of Nunavut's economic activity, and jobs in administration, education and health account for about half of all employment earnings in the territory. Public administration accounted for \$271 million, or 24%, of the territory's total \$1.1 billion gross domestic product (GDP) in 2008. Education and health expenditures account for another \$202 million. Combined, these public expenditures account for more than 40% of the territory's GDP.

Nunavut's mining sector is once again expanding following closure, in the previous decades, of the Nanisivik and Polaris mines in the North Baffin region and the Lupin and Jericho mines in the Kitikmeot region. In 2012, the Meadowbank Mine outside the study area in the Kivalliq accounted for 30% of Nunavut's GDP.<sup>27</sup> Medium-term prospects for expansion in the sector include TMAC Resources Ltd.'s Hope Bay development in the Kitikmeot region and AREVA Resources Canada's Kiggavik project in the Kivalliq region. In addition, there are a number of mining proposals currently undergoing NIRB review: Sabina's Back River Project, Xstrata Zinc Canada's Hackett River Project and MMG Resource Ltd.'s Izok Lake Project in the Kitikmeot region, and AEM's Meliadine Project in the Kivalliq region. The approved Mary River Project is the most advanced project in the Baffin region.

The construction industry in Nunavut is driven by a combination of government-funded infrastructure projects and major private sector developments such as the Meadowbank Mine Project. Territorial government planned capital expenditures for the North Baffin total \$32.3 million for the planning period 2010-11 to 2014-15, with another \$33 million planned for Iqaluit. Across the territory, \$381.6 million in capital expenditures is envisioned over this period.

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<sup>27</sup> CBC News, Nunavut's Meadowbank Gold Mine Back on Track, April 12, 2013.

The transportation sector provides a critical link between Nunavummiut in small communities to the specialized medical and educational services available only in larger centres. For the 2010-2011 fiscal year, for example, the territorial government budgeted \$47.9 million for medical travel, an expenditure item that has increased at a rate of 6.9% year-over-year, from a level of \$32.6 million in 2005-2006. Goods imported into Nunavut by air and marine transport totalled \$900 million in 2008, and the Iqaluit airport was among the top 20 busiest airports in Canada, based on number of flights. In spite of the tremendous importance of air and marine transport, the sector is largely based outside the territory and transportation contributes less than \$21 million to the territorial GDP.

Infrastructure gaps are frequently suggested as important barriers to business, social, and cultural development in communities across the region. Hamlet Community Economic Development Plans call for many types of infrastructure: space for small businesses, workshop space for carvers, visitor centres, fish plants, swimming pools, day cares, youth centres and wellness centres.

Nunavut has a small commercial fishery based on turbot and shrimp fished offshore primarily in Baffin Bay and Davis Strait. In addition to the offshore fishery, commercial arctic char production is carried out at plants in Pangnirtung, Iqaluit, Rankin Inlet, and Cambridge Bay. Although the economic value is modest, the quality of this product is high and potential for value-added processing and marketing, including supplying the local Nunavut market where high retail food prices are the norm, continues to be realized. A modest commercial caribou and musk ox harvest is also carried out, the former predominantly from Coral Harbour and the latter from Cambridge Bay. As with the char fishery, these products represent high-value specialties that sell for premium prices.

Most visitors to Nunavut come to the territory for work. Business travelers account for approximately three-quarters of all Nunavut visitors. Between 3,000 and 6,000 visitors come each year for non-work purposes and this component spends \$6 to \$12 million annually. An amount of \$500,000 is estimated to be allocated each year across the North Baffin to tourism activities outside business travel and sport-hunting. In addition to spending by tourists who come to visit friends and family living in the north, these expenditures also include those of cruise ship visitors (\$15,000 in one community), visitors to the national park, and adventure tourists.

The current amount of work opportunity generated by the wage economies of the study area amounts to the equivalent of 3,700 to 3,900 full-time, year-round jobs, of which 1,100 are located in North Baffin and 2,600 to 2,800 in Iqaluit. This equates to approximately 2 million hours of work in the North Baffin labour market each year, and 4.7 million hours of work in the Iqaluit labour market.

Most North Baffin region residents reporting self-employment income earned less than \$5,000 through their business activities. In Iqaluit, self-employment earnings are a little higher, with half of self-employment income earners reporting more than \$5,000, and 1-in-5 reporting \$35,000 or more. Of the self-employment income earners in Iqaluit, 1-in-4 had family incomes with no other source of market income. Most people who report self-employment income however, live in families where a wage income is also earned. This other income can be substantial.

In Iqaluit in 2004, 100 of the 240 self-employment income earners, or 42%, had family wage incomes of \$85,000 or more. In the rest of the Baffin region, a similar proportion of self-employment earners (24%) have no other family wage income. In these communities, however, the level of other family wage

income is lower, with only 41% of families having wage incomes of \$35,000 or more, suggesting that employment income plays an important role as a spring-board to self-employment. While a few families rely on self-employment as their main source of income, it is more common that self-employment activities are nurtured by the wage employment earnings of either the self-employed person or a family member, or both. This pattern appears to be stronger in Iqaluit than it is in the other Baffin region communities.

Low baseline levels of literacy and numeracy present a major challenge to labour force development in the region and across Nunavut. In a report on adult learning in Nunavut, the largest group of adult learners in the territory are said to be at the lowest two levels of the four-level scale used in the International Adult Literacy and Skills Survey.

Early childhood education (pre-school) opportunities are not widely available across the study area. Before-school and after-school programs, which are important for parents working during the day, are absent in nearly all communities in the region, except for Clyde River, where an after-school program has been in place since 2008. The level of service in Iqaluit is better, with full-day and part-day preschool programs and after-school programs available.

The number of high school graduates has been increasing in Iqaluit and across North Baffin over the past 20 years. In total, 390 North Baffin and 393 Iqaluit residents have graduated from high school since 1987. However, while Grade 12 enrolment in Iqaluit and Pond Inlet has increased in recent years, it has declined elsewhere in the North Baffin region.

While education levels are low across the study area, many residents of the Baffin region have been engaged in training and upgrading through the local college system and through various specialized programs. Arctic College, which has Adult Learning Centres in every community, reports that between 1,200 and 1,350 Nunavummiut enrol in full-time programs at the college. This equates to roughly one-quarter of the population between 20 and 29, or one-fifth of the 20-to-34 age group.

The Inuit of the North Baffin region have experienced tremendous social and cultural change over the course of a few decades. In particular, initiatives such as residential schools, have affected family integrity and by implication, social cohesion. Elders are becoming increasingly engaged in community life and in promoting the learning of traditional culture for the younger generation. At the same time, a shift toward western middle-class expectations appears to be taking place among Inuit youth. These communities have experienced dramatic population growth over the last 20 years. Over 70% of the population is under the age of 25. Underemployment and lack of opportunities are contributing to social stress.

Demand amongst residents for wage employment is very high. However, job opportunities in the North Baffin are limited. Inuit employment in North Baffin is characterized by many individuals earning small levels of income, well under what full-time work would pay, and a small number earning full-time, year-round incomes. Most residents working in full-time jobs in Iqaluit do so year-round. In North Baffin, many more full-time workers are engaged in these jobs for only short periods. Women who work full-time jobs in North Baffin are more likely to work year-round than are men.



Still, there are good-paying, full-time, year-round employment opportunities available. These are often in government and the “public sector” and require levels of education and kinds of experience that many residents do not have.

The number of jobs occupied by women has generally increased at a greater pace than those occupied by men. However, women in the region are working mostly in the public sector. The past public sector growth is not likely to continue and this suggests that as young women start to look for employment, they may need to find work in sectors not traditionally filled by women.

There are indications of an increasing net movement of Inuit from communities in the north to urban centres in the south. During the 10-year period between the 1996 and 2006 censuses, the Inuit population in regions outside traditional Inuit lands, or “Inuit Nunaat,” increased 62% from 6,795 to 11,000 individuals. In 2006, Inuit living outside Inuit Nunaat accounted for 21.8% of the 50,480 Inuit living in all regions of Canada.

Approximately one-in-five jobs in North Baffin and in Iqaluit require a university education. One-quarter to one-third of jobs in the region require college or apprenticeship levels of training and skills. A similar number require high school education and/or occupation-specific training. The remainder can be accessed by unskilled workers with on-the-job training.

The Government of Nunavut relies on federal transfer payments for at least 90% of its revenue. Government employment is a mainstay of the wage economy with many of Nunavut's small businesses and retail outlets established to support government needs, or those of public servants. Government jobs in administration, education, and health areas account for about half of all employment earnings in the territory. Construction employment has also been growing to support the development of government infrastructure.

Life expectancy at birth in Nunavut is 10 years shorter than it is for the Canadian population overall. From 1999 to 2001, life expectancy at birth in Nunavut was 68.7 years. Life expectancy at age 65 is similar among the male populations of Canada and Nunavut. However, while Canadian women age 65 can expect to live an additional 20.6 years, a Nunavut woman's average life expectancy at age 65 is only an additional 11.4 years.

In Nunavut, the birth rate is roughly twice that of Canada generally, while the incidence of pre-term delivery and low birth weight are both high relative to Canada overall. Although Nunavut's infant mortality rate has been improving, it is, however, much higher than in other regions of Canada.

Tobacco smoking rates are high in Nunavut and have an adverse effect on the health of residents. Alcohol abuse is also an issue that concerns many residents, health practitioners, social service providers and those involved in the justice system.

In the Baffin Region, Iqaluit is the only “open” community, while Kimmirut, Pangnirtung, and Sanikiluaq are the only “dry” communities. The five communities of the North Baffin Local Study Area (LSA) each have policies in place to restrict access to alcohol. Bootleg alcohol, however, is considered to be widely available at a high cost.

The rate of violent crime in Nunavut is the highest across Canada, varying from between six and eight times the national rate during the period 1999 to 2007. Within the LSA, violent crime across North Baffin has been slightly over half the rate in Iqaluit.

A territorial breakdown of crime incidents provides insight into the nature of this violence. The rate of sexual assault across the territory reached a peak in 2003 at over ten times the national rate. While rates of sexual assault continued to be high into the later part of the decade, a decline has been noted, with the 2008 rate being the lowest of the ten-year period. Assaults with weapons and assaults causing bodily harm have increased consistently and dramatically over the decade.

### 2.1.4 Map of Project Activities

### Figure 5: Location of ERP Proposal Activities



## **2.2 Project Description**

### **2.2.1 Need for the Project Amendment**

The execution of the approved Mary River Project (Approved Project) requires a large financial undertaking from the Proponent. Although the financial returns generated by this investment are attractive, the “Approved Project” as planned in Project Certificate No.: 005 has two main risks: 1- the funding requirement is large with 4 years construction prior to revenue generation; 2- market and economic uncertainties. As stated in correspondence to the Nunavut Impact Review Board (NIRB) on January 13, 2013, due to various business drivers, Baffinland proposed to make changes to the schedule and some activities in the initial stages of project development associated with the Mary River Project. This Early Revenue Phase (ERP) Proposal for the Mary River Project stated that the changes to the Approved Project are necessary because the current global financial market is averse to taking on large value financial risks making it difficult to fund the Approved Project. The ERP Proposal enables the Approved Project to advance in a phased approach.

In its request to the NIRB, Baffinland indicated that although the company remains committed in the long-term to develop the Approved Project, as authorized under Project Certificate No.: 005; in the short-term, Baffinland proposed to change some development activities and project timelines to accommodate the ERP Proposal. The ERP Proposal would include development of a nominal 3.5 million tonnes per year (Mt/a) iron ore road haulage operation from the Mary River mine site to a port facility at Milne Inlet for open water shipping of the iron ore. As noted by Baffinland, this development option was presented previously as a project alternative, and was included within the initial review of the Draft Environmental Impact Statement for the Approved Project. Key advantages of this ERP’s proposed phased project approach include: 1- reduced initial capital requirements and generation of early revenue; 2-open water shipping during the ERP; 3- early product exposure at reduced quantity, while enabling Northern communities to slowly adjust to training, jobs and business opportunities.

The ERP Proposal will enable the company to generate consumer interest and revenue from the exploitation of Deposit No.1, which in turn will enable the company to secure financing and proceed with the development of the Approved Project.

## 2.2.2 Project Components and Phases

The major project components and associated project activities of the Early Revenue Phase (ERP) Proposal include:

- 1) Iron ore production at the Mary River mine site.
- 2) Truck transportation ore along the Milne Inlet Tote Road.
- 3) Open water shipping of ore from Milne Port.

Mary River Mine Site - the ERP Proposal includes the extraction of 3.5 million tonnes per year (Mt/a) of iron ore from the Mary River mine site that would be loaded onto trucks at the mine site for transportation to Milne Port.

Milne Inlet Tote Road – the 3.5 Mt/a of iron ore from the Mary River mine site would be trucked along the Milne Inlet Tote Road to Milne Port using conventional trucks with two trailers. This truck transportation of the ore would result in approximately 152 truck transits per day, approximately 330 days of the year.<sup>28</sup>

Milne Port - the ERP Proposal would require the development of additional infrastructure at Milne Port including the construction of a fixed ore dock, 3.5 Mt ore stockpile and reclaim area, 3500 tonnes per hour ship loaders, camp expansion to accommodate 60 workers and the extension and relocation of the airstrip to the west of the proposed ore stockpile. The ships transporting the ore to markets in Europe would include Panamax, Supramax and Post Panamax vessels of approximately 50,000 deadweight tonnage (DWT) to 110,000 DWT.

Shipping from Milne Port would occur during the open water season, which Baffinland has defined as the approximate period between July 15<sup>th</sup> and October 15<sup>th</sup>.<sup>29</sup> The ERP proposes to transport the iron ore to European markets using approximately 54 ship sailings, which would account for approximately one ship passing through Milne Inlet every day.<sup>30</sup> The proposed ERP shipping route would transit through Eclipse Sound via Baffin Bay and down to Milne Inlet Port. The Proponent has indicated that ships travelling through Eclipse Sound and Milne Inlet would maintain a speed of 7 to 10 knots upon entering Milne Inlet and at the Public Hearing, Baffinland stated they would not have an issue with ships slowing down to 10 knots upon entering Pond Inlet.<sup>31</sup> Vessels travelling to Milne Port would release

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<sup>28</sup> FEIS Addendum, Volume 3, Section 2.1.7.

<sup>29</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 70, lines 12-17.

<sup>30</sup> FEIS Addendum, Volume 3, Section 2.4.3.

<sup>31</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 29, 2014, p. 83, lines 2-5, and p. 612, lines 14-16.

approximately 20 000 tonnes of ballast water each trip into Milne Port to load the ship with iron ore for transportation to markets in Europe.<sup>32</sup>

## 2.2.3 Construction and Operations

### *Construction phase:*

The FEIS Addendum stated that construction of additional infrastructure required for the ERP<sup>33</sup> (i.e., Milne Port facilities, including a fixed ore dock), would last approximately 2 years and would commence once the Project Certificate No.: 005 is amended by the NIRB (Baffinland anticipates this might occur in early 2014).<sup>34</sup> Construction of the ERP facilities would be completed by the end of 2015 except for final commissioning of the ship loader, which cannot occur until mid-July when ore shipping begins in the open water season of 2015. Baffinland expects to ship approximately 2 Mt of iron ore in 2015, followed by 3.5 Mt shipped on a yearly basis for the life of the ERP (i.e., 21 years).<sup>35</sup>

The ERP construction work week for potential ERP employees would generally consist of 10 or 12-hour days, seven days per week. The scheduled work rotation for many contractors during the ERP construction phase would be expected to be four weeks on/two weeks off. Workers hired from North Baffin communities would have the option of working two weeks on/two weeks off during ERP construction.<sup>36</sup>

### *Operation phase:*

The ERP operations phase is expected to last approximately 21 years with the first shipments of iron ore leaving Milne Inlet Port during the open water season of 2015 (full production of 3.5 Mt of iron ore would be shipped from Milne Port in 2016). As the ERP transitions into the operations phase, construction of the approved Mary River Project infrastructure is anticipated to begin following the completion of ERP construction and lasting 4 years with the first expected shipment of iron ore from Steensby Inlet Port occurring by the end of 2019.<sup>37</sup>

The ERP shipping operations would include the lease (rather than purpose-built ore carriers), of 18 to 28 leased vessels, of approximately 55,000 DWT to 110,000 DWT in size. The actual fleet size will depend upon charter strategy and availability of vessels annually. The ERP operations employee rotation would be 14 days of 12-hour shifts followed by 14 days off.<sup>38</sup>

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<sup>32</sup> Calculation of ballast water to be released in Milne Port based on the FEIS Addendum, Volume 3, Section 2.4.7; assumes the use of an 80,000 DWT vessel and that ballast water would account for 25% of the vessel's deadweight.

<sup>33</sup> Much of the ERP infrastructure was established under the approved Mary River Project Certificate No.: 005.

<sup>34</sup> FEIS Addendum, Volume 3, Sections 1.0 and 1.1.

<sup>35</sup> FEIS Addendum, Volume 3, Sections 1.0 and 1.1.

<sup>36</sup> FEIS Addendum, Volume 3, Section 4.1.

<sup>37</sup> FEIS Addendum, Volume 3, Sections 1.2.

<sup>38</sup> FEIS Addendum, Volume 3, Section 4.2.

## 2.2.4 Decommissioning and Reclamation

The FEIS Addendum outlines Baffinland's interim Mine Closure and Reclamation Plan for the ERP that incorporates progressive rehabilitation during the course of the Project to limit the environmental effects during the Project life. The plan addresses temporary and long-term closure as well as final cessation of operations.

Roads (with the exception of the public Milne Inlet Tote Road), airstrips and development areas would be re-contoured, as required, to provide long-term stability and reduce the potential for erosion. The Milne Inlet Tote Road is part of the Inuit Owned Lands referenced in the NCLA (Section 21.4.1) and is designated for public use and would be left intact. The bridges, culverts and other water crossings along the Milne Inlet Tote Road would also remain in place.<sup>39</sup>

The closure phase is expected to be three years, followed by a minimum of five years of monitoring and treatment, if required. Reclamation would be accomplished using a progressive approach throughout the life of the mine and would be implemented as follows:<sup>40</sup>

- *Laydown areas* - unused areas or areas no longer needed during operations would be regraded and contoured to prevent pooling of water and facilitate natural drainage;
- *Camps* - following the construction phase, construction camps would be removed and/or downsized. The affected area will be regraded and contoured to facilitate natural drainage;
- *Quarries and Borrow Pit* - once exhausted or no longer required, sites would be graded to maintain safe side slopes and where practicable to maintain the natural drainage of the area;
- *Landfills* - landfills would be progressively covered with an interim cover consisting of overburden to allow the contents of the landfills to remain permanently frozen;
- *Landfarms* – hydrocarbon contaminated soils would be excavated and treated in the landfarms throughout the life of the Project;
- *Roads* – roads no longer required during operations would be decommissioned. Stream crossings would be removed and drainage channels that are stable in the long term established;
- *Mine Pit* - a boulder fence or equivalent would progressively be placed around the open-pit perimeter as material becomes available; and
- *Waste rock stockpile* - management practice would ensure containment and coverage of potentially acid-generating rock (PAG) rock within the confines of the waste rock stockpile.

In addition to progressive closure activities, research studies will be undertaken during operations to examine the revegetation of disturbed areas using local vegetation trials. Pending the outcome of these studies, the findings from the vegetation trials may be incorporated into updates of the Mine Closure and Reclamation Plan.

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<sup>39</sup> FEIS Addendum, Volume 3, Section 3.3.5.

<sup>40</sup> FEIS Addendum, Volume 3, Sections 3.1 and 3.2.

## **3. INVOLVEMENT OF INTERESTED PARTIES**

### **3.3 Consultation Opportunities**

#### **3.3.1 Public Consultation**

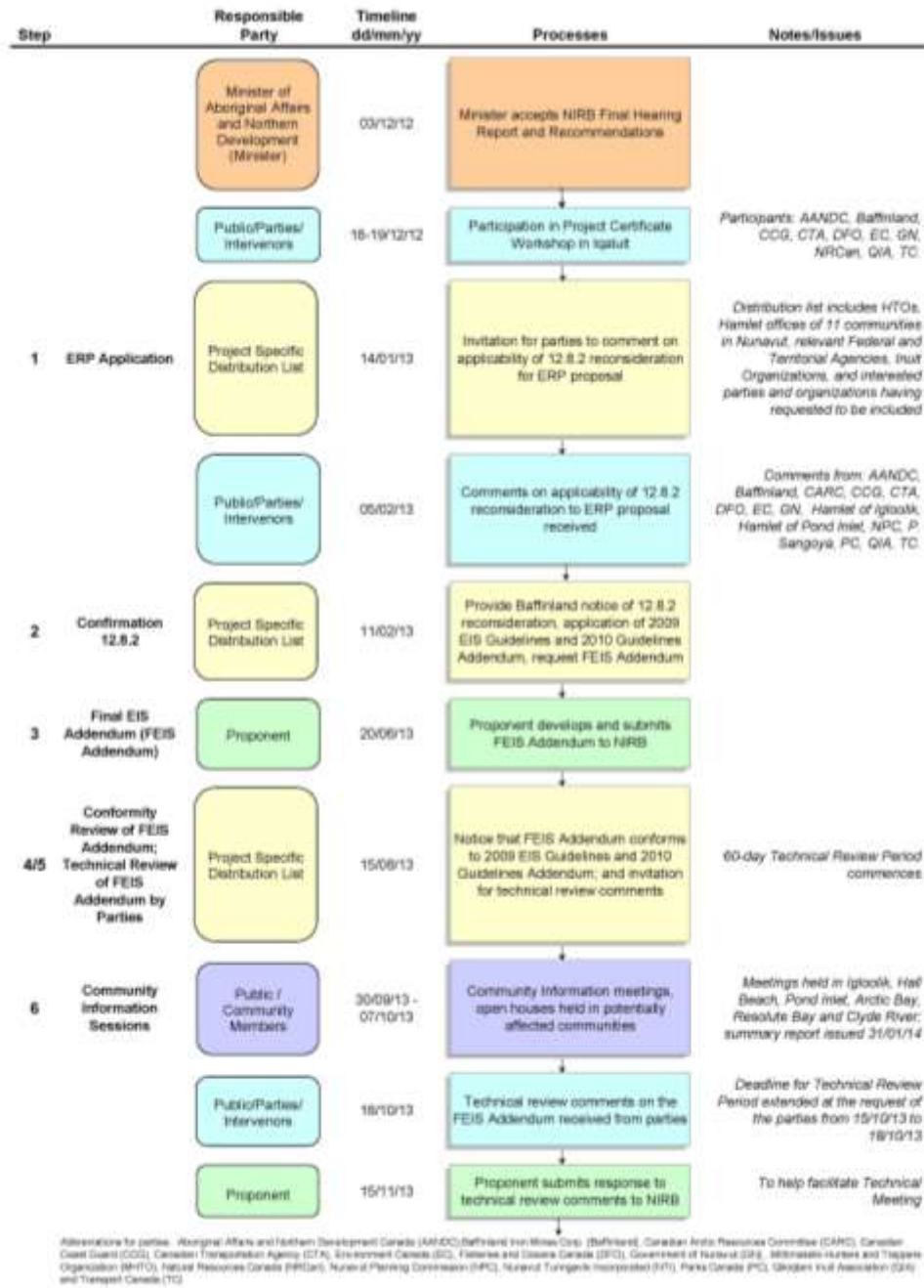
Public participation is a central objective of the NIRB's assessment processes, including the reconsideration of project certificate terms and conditions as undertaken for Baffinland's ERP proposal. Effective public participation within the reconsideration process requires that the process address concerns of the general public regarding the anticipated or potential environmental effects of the ERP Proposal. The NIRB's reconsideration process must also involve potentially affected Nunavummiut to address concerns regarding any changes that the Project may cause in the environment and the resulting effects of any such changes on the traditional and current use of land and resources. The Proponent was required to ensure that Nunavummiut have access to information regarding the ERP Proposal and its potential impacts. In this regard, Baffinland's specific consultation efforts are summarized in the Final EIS Addendum, Vol. 2, Appendix 2A-1.1.

The consultation efforts and opportunities for Nunavummiut to provide their comments to the NIRB during the reconsideration process are outlined in Figure 7 that follows.

For parties wishing to access listings of the attendees at the community information sessions facilitated by the NIRB or at the Public Hearing held as part of the reconsideration process, sign in sheets associated with these meetings, sign in sheets from each are available online from the NIRB's public registry at <http://ftp.nirb.ca>.



Figure 6: Public Consultation Efforts and Opportunities



Step		Responsible Party	Timeline dd/mm/yy	Processes	Notes/Issues
7	Technical Meeting	Public/Parties/Intervenors	26-28/11/13	Technical Meeting (TM)	Held in Iqaluit with some participation by teleconference. NPC in attendance
		Project Specific Distribution List	12/11/13	Notice of Public Hearing issued and invite final written submissions	Notice provided to Mary River Distribution List, includes information regarding applications for formal intervenor status at the Hearing; advertisement published in English, Inuktitut and French in Nunavut newspapers; 60-day period for final written submissions
		Public/Parties/Intervenors	13/12/13	Applications for Intervention Status filed	Intervenor applications received from Hamlet of Pond Inlet, Mittimataki Hunters and Trappers Organization, and Dr. Zacharias Kunuk / Isuma TV
		Public/Parties/Intervenors	16/12/13	Intervenor Status granted to the applicants	All applicants, Hamlet of Pond Inlet, Mittimataki Hunters and Trappers Organization, and Dr. Zacharias Kunuk / Isuma TV granted Intervenor Status
		Zacharias Kunuk / Isuma TV	20/12/13	Request to film and record the Mary River 12.8.2 Public Hearing in Pond Inlet to document and increase public awareness and participation	07/01/14 NIRB grants Zacharias Kunuk / Isuma TV's request to film and record in accordance with conditions
		Public/Parties/Intervenors	13/01/14	Final written submissions from parties and intervenors	Submissions filed by: Baffinland, QIA, GN, AANDC, DFO, EC, NRCAN, PC, TC, Hamlet of Pond Inlet, MHTO, Zacharias Kunuk / Isuma TV, E. Inuarak, G. Kuukishak
		Public/Parties/Intervenors	17/01/14	Opportunity to comment on draft Hearing Agenda	
		Public/Parties/Intervenors	22/01/14	Comments from parties on draft agenda	Comments received from Baffinland, GN, QIA
8	Public Hearing	Public/Parties/Intervenors	27-31/01/14	Participation in Public Hearing, Technical Sessions and Community Roundtable Sessions in Pond Inlet	Appearances on the record include: Baffinland, NPC, NTI, QIA, GN, AANDC, DFO, EC, NRCAN, PC, TC, the Hamlet of Pond Inlet, MHTO, Zacharias Kunuk, Community Representatives from Grise Fiord, Resolute, Arctic Bay, Clyde River, Hall Beach, Iqaluit, Igloolik and Pond Inlet, and members of the public in Pond Inlet

Abbreviations for parties: Aboriginal Affairs and Northern Development Canada (AANDC), Baffinland Iron Mines Corp. (Baffinland), Canadian Arctic Resource Committee (CARC), Canadian Coast Guard (CCG), Canadian Transportation Agency (CTA), Environment Canada (EC), Fisheries and Oceans Canada (DFO), Government of Nunavut (GN), Mittimataki Hunters and Trappers Organization (MHTO), Natural Resources Canada (NRCan), Nunavut Planning Commission (NPC), Nunavut Tunngavik Incorporated (NTI), Parks Canada (PC), Qikiqtaaluk Inuit Association (QIA) and Transport Canada (TC).

In addition to the consultation activities of the NIRB and the Proponent, increasingly, over the past decade, with better public access to the internet and Northern-based media outlets, the media have an important role in support of the NIRB's goals of enhanced public awareness and participation by providing notice of meetings and hearings, disseminating information and, in some cases, providing interactive discussion forums that allow people to express their opinions and increase their understanding. The Board appreciates the significant contributions of the media with respect to the ERP Public Hearing held in Pond Inlet. It is hoped that the presence of local media and live streaming of proceedings contributed to a heightened level of public awareness of both the Project and the NIRB's reconsideration process.

## **3.4 The Participants**

### **3.4.1 Nunavut Planning Commission (NPC)**

The NPC is an Institution of Public Government established under the Nunavut Land Claims Agreement (NLCA), with responsibilities for land use planning in Nunavut under Article 11 of the NLCA. The NPC prepares and implements land use plans that guide and direct resource use and development within the Nunavut Settlement Area. As outlined in detail in Appendix B of this report, with respect to the Mary River Early Revenue Phase Proposal, the NPC has conducted a joint review, in conjunction with the NIRB, of the proposed transportation corridor associated with the proposed intensification of use of the tote road under Section 3.5.12 and the guidelines in Appendices J and K of the North Baffin Regional Land Use Plan

### **3.4.2 Nunavut Tunngavik Inc. (NTI)**

NTI is a privately incorporated organization that is the successor to Tungavik Federation of Nunavut, the signatory to the Nunavut Land Claims Agreement (NLCA). NTI is responsible for representing the Inuit of all the regions and communities of Nunavut to safeguard, administer and advance the rights and benefits that belong to the Inuit of Nunavut and to promote their economic, social, and cultural well-being through succeeding generations. NTI advances and protects Inuit interests and ensures that the commitments made under the NLCA are met. With respect to the Mary River Early Revenue Phase Proposal, NTI are the owners of the minerals that would be mined, and consequently, NTI would be responsible for ensuring that the project complies with NTI's mining policy, reclamation policy, and resources revenue policy.

### **3.4.3 Qikiqtani Inuit Association (QIA)**

QIA is a Designated Inuit Organization under the Nunavut Land Claims Agreement, representing the rights and values of the Inuit within the Qikiqtaaluk concerning rights to water and wildlife compensation, landowner rights, and the Inuit Impact and Benefit Agreement. The QIA participated in all stages of NIRB's environmental review process for this Project. To aid in additional communication and engagement with communities specific to the previous Mary River Project, the QIA formed and administered seven Mary River Project Committees (Arctic Bay, Cape Dorset, Clyde River, Hall Beach, Igloolik, Kimmirut and Pond Inlet). Recommendations made by the local project review committees were included in the QIA's final submission. During the review of the Early Revenue Phase Proposal, the QIA developed new and amended Project Certificate terms and conditions necessary to ensure that Inuit issues are fully addressed. The suggested revisions are also intended to account for increased project activities along the tote road and at Milne Inlet as a result of the activities to be conducted under the Early Revenue Phase Proposal.

The key areas identified by the QIA as warranting revisions to reflect the ERP activities included the following:

1. Aquatic Wildlife and Habitat;
2. Terrestrial Wildlife and Habitat;
3. Regulatory and Engineering (including production rate);
4. Socio-economics; and
5. Specific recommendations from Mary River Project Committees.

The QIA concluded that if the revised and additional terms and conditions become part of an amended Project Certificate, appropriate mechanisms will be in place to effectively monitor and manage the proposed project in an acceptable manner.

### **3.4.4 Government of Nunavut (GN)**

While the federal government currently has authority over the management of mineral resources in Nunavut, the GN has significant jurisdictional responsibility and permitting authority over activities that affect wildlife and wildlife habitat, Commissioner's lands, municipalities, education, health, social services, public safety, culture, community development, property rights, and the administration of the laws in Nunavut. It is the GN's objective to ensure that mineral resource projects in Nunavut are developed in a manner that respects, protects and cares for the land, animals and the environment. At the same time the GN is responsible to ensure that the Mary River Early Revenue Phase Proposal will create positive effects on the socio-economic conditions of the territory by providing opportunities for employment, education and training to Nunavummiut.

The GN's review of the Early Revenue Phase Proposal involved the Environment and Human Health Assessment Committee led by the Department of Environment, the Socio-economic Assessment Committee led by Economic Development and Transportation. Specifically, representatives of the Departments of Health, Culture and Heritage, Community and Government Services, Economic Development and Transportation, Education, Family Services, Finance, Executive Intergovernmental Affairs, Department of Justice, Nunavut Arctic College, Nunavut Research Institute and Nunavut Housing Corporation contributed to the review.

Key issues identified by the GN included:

- Potential for impacts on hunter harvests and food security;
- Potential impacts associated with changes in employment levels resulting in changes to public housing rental rates, migration patterns affecting public housing demand;
- The impacts associated with timing of tax revenue associated with the increase in production associated with the Early Revenue Phase Proposal;
- Ensuring that cultural resources within or close to project development areas are monitored and properly mitigated;

- Compensation issues associated with potential mass mortality of polar bears;
- Deficiencies in the Shipping and Marine Wildlife Management Plan with reference to polar bears;
- Inadequate polar bear safety and deterrence plans;
- A lack of caribou monitoring at the population level;
- Issues with respect to efficacy of the visual caribou decision tree model during periods of darkness; and
- Concerns about increased access and harvesting associated with project infrastructure and Baffinland's hunting policies for employees.

### **3.4.5 Aboriginal Affairs and Northern Development Canada (AANDC)**

AANDC is the federal government department responsible for meeting the Government's obligations and commitments to First Nations, Inuit and Métis, and for fulfilling the federal government's constitutional responsibilities in the North. AANDC reviewed the Addendum to the Final Environmental Impact Statement for the Early Revenue Phase Proposal with respect to the following: impacts to freshwater; the environmental implications of road, port and related infrastructure design, construction, operation, closure and reclamation; accidents/malfunctions and waste and hazardous materials management; and socio-economic considerations.

AANDC's technical review comments about the Early Revenue Phase Proposal focused on:

- Water quality and management;
- Potential dredging activity;
- Road management; and
- The duration of Early Revenue Phase activities.

AANDC agreed with the conclusions presented in the FEIS Addendum and did not have any specific recommendations for the amendment or inclusion of additional terms and conditions in the existing Project Certificate No.: 005.

### **3.4.6 Environment Canada (EC)**

EC is responsible for leading implementation of the Government of Canada's environmental agenda and is committed to contributing to the realization of sustainable development. EC's mandate covers the preservation and enhancement of the quality of the natural environment, including water, air, soil, flora and fauna, as well as species at risk and migratory birds. In addition to EC's mandate to conserve and enhance the quality of the natural environment, the Department administers the pollution prevention provisions of the *Fisheries Act*. EC also regulates toxic chemicals and the development and

implementation of environmental quality guidelines pursuant to the *Canadian Environmental Protection Act, 1999* (CEPA 1999). EC is responsible for protecting and conserving migratory bird populations and individuals, under the *Migratory Birds Convention Act, 1994* (MBCA), and administers the *Species at Risk Act* (SARA) in cooperation with Fisheries and Oceans Canada and Parks Canada.

In their final submission EC provided recommendations with respect to the following:

- **Atmospheric Environment**
  - Continuous air quality monitoring at Port sites and shipping routes
  - Amendment of Condition 8 to include Milne Port
  - Include Tote Road in Dust Monitoring Plan
- **Marine Environment**
  - Increase research and monitoring for migratory birds along northern shipping route
  - Apply mitigation to avoid wake impacts on migratory birds
  - Limit the number of ship transits through Milne Inlet on an annual basis
- **Aquatic Environment**
  - Metal Mining Effluent Regulations should not apply to port ore stockpiles
  - Wastewater should be managed to avoid impacts to receiving environment
  - Nutrient inputs to Mary River must be understood and monitored to avoid impacts
  - Airstrip run off must be managed effectively
- **Terrestrial Environment**
  - Impacts to birds must be minimized from air traffic at Milne Port, water withdrawals from Phillips Creek and activity along Tote Road
  - That problem polar bear management should include additional text: “where possible, problem bears that are not responding to deterrents will be immobilized, removed from operational facilities and transported to a location that inhibits return”
- **Environmental Emergencies**
  - Additional spill trajectory modelling required
  - Plans should reflect EC’s new Emergencies Program delivery format.

### **3.4.7 Fisheries and Oceans Canada (DFO)**

The federal government exercises authority over seacoastal and inland fisheries specifically for the management and protection of fish, marine mammals and their habitat within Canada’s territorial boundaries. DFO’s primary focus in reviewing proposed developments in and around fishery waters is to ensure that the works and undertakings are conducted in such a way that the Proponents are in compliance with the applicable provisions of the *Fisheries Act*, the Fisheries Protection Policy Statement, the Fisheries Productivity Investment Policy and the *Species At Risk Act*. The regulatory role occupied by DFO with respect to the Early Revenue Phase Proposal arises from ss. 20, 21, 35(1) and (2) and s. 36 of the *Fisheries Act*.

In DFO’s submissions to the Board, the following key issues were identified:

- Impacts of shipping on marine mammals (including noise and ship strikes)

- Impacts of ballast water discharge (presentation of new DFO national risk assessment for ballast water discharges); and
- Impacts of ore dock construction (impacts of vibratory pile driving, dredging and sedimentation or erosion of fish habitat).

DFO offered a number of detailed recommendations in respect of each area, including the following:

- Additional baseline data should be collected to identify areas of high potential for ship interactions with marine mammals and to inform mitigation measures
- Individual whales (Narwhal and Bowhead) should be identified and monitored over time to better understand individual reactions to marine traffic;
- Marine mammal population levels should be monitored over the life of the project to identify effects;
- Ballast water treatment versus ballast water exchange should be considered; and
- Baffinland should develop a plan to undertake offsetting measures to counterbalance residual serious harm to fish and this plan should include incorporate input from the communities.

### **3.4.8 Natural Resources Canada (NRCan)**

The mandate of NRCan is to develop, implement and deliver policies, programs, science and technology for the sustainable development and responsible use of Canada's mineral, energy and forestry resources. With respect to the Mary River Early Revenue Phase Proposal, NRCan would have responsibility for issuing a licence for the manufacture and storage of explosives on-site under the *Explosives Act*. NRCan also provided advice and expertise in permafrost and terrain stability and coastal geology.

With respect to permafrost and terrain stability, NRCan considered changes to permafrost and terrain stability associated with the change to the planned use of the Tote Road and Milne Port facilities. With respect to Coastal Geology (ship wakes in Milne Inlet), NRCan concluded that the ERP will increase the occurrence of moderate to large waves and recommended that Baffinland conduct analyses on potential wave energy effects on shorelines at Milne Inlet and also identify important physical coastline features that may be susceptible to increased wave action from shipping. Further, with respect to Coastal Geology (sediment transport at Milne Port), NRCan concluded that there is a possibility of disturbance to sediments in the area of Milne Port and recommended that Baffinland conduct hydrodynamic modelling.

### **3.4.9 Parks Canada (PC)**

PC has a broad mandate for ecological integrity, cultural resource management and traditional use, and park user experience for national parks, including Sirmilik National Park which is located near the proposed Mary River Early Revenue Phase Proposal. PC also has a mandate in the context of the proposed National Marine Conservation Area (NMCA) in Lancaster Sound and adjacent waterways, including Eclipse Sound and Pond Inlet. Under the *National Marine Conservation Areas Act* shipping is



an allowed activity in an NMCA, with the standard expectation that it be conducted in accordance with all applicable regulations and best practices.

The areas of interest for PC with respect to the Mary River Early Revenue Phase Proposal included potential for the ERP to have effects on the following:

- Visitor/Park User experience (sight, noise, safety issues for visitors travelling by water);
- Seabirds (effects on colonies during breeding, summering and staging);
- Caribou (effects on population, migration and management);
- Marine Mammals (especially on critical habitat for narwhals, including nursery habitat); and
- Marine Ecosystem (movement and introduction of non-native species, impacts from spills, disturbance associated with noise).

With respect to mitigation measures, PC adopted the recommendations from other Federal departments, the Government of Nunavut and the Qikiqtani Inuit Association designed to address specific predicted impacts.

### **3.4.10 Transport Canada (TC)**

TC is responsible for promoting an integrated transportation system that is safe, secure, efficient and environmentally responsible. TC is responsible for regulating transportation infrastructure, equipment and personnel in accordance with relevant legislation and regulations. With respect to the Early Revenue Phase Proposal, TC is responsible for administering programs in relation to vessel safety, security, pollution prevention, pollution response, marine liability and compensation and navigable waters. TC assesses project proposals for proposed works on navigable waters under the current *Navigable Waters Protection Act* and the amended legislation, the *Navigation Protection Act* (expected to come into force in April, 2014).

TC's submissions with respect to the Early Revenue Phase Proposal considered and provided recommendations with respect to the following issues:

- Over-wintering of fuel vessels;
- Use of containment booms before the transfer of fuel;
- Navigable waters;
- Potential effects on the marine environment;
- Open water shipping;
- Oil Pollution Emergency Plan requirements; and
- The proposed transportation corridor.

TC did not recommend any new terms and conditions for the ERP.

### **3.4.11 Zacharias Kunuk – Nunavut Independent Television Network, Isuma Distribution International Inc. and Kigullitt Productions Inc.**

Dr. Kunuk intervened as an Inuit filmmaker and hunter who has spent his life in the region of the proposed Mary River Early Revenue Phase Proposal. The submissions of Dr. Kunuk focused on the importance of integrating human rights standards into Baffinland's corporate responsibility policies, procedures and practices for the Mary River mine; and emphasized the importance of information and consulting Inuit and other affected stakeholders over the mine's lifespan.

With respect to integrating human rights standards into Baffinland's corporate responsibility policies, it was recommended that Baffinland incorporate relevant international standards (ISO 26000:2010 and UN Guiding Principles on Business and Human Rights) and develop a timeline for the development of these corporate responsibility policies. With respect to consultation, Dr. Kunuk's submissions recommended participation of all parties to the assessment and project approval process to identify best practices for sharing information and the most effective means of consulting with Inuit on an on-going basis. In addition, the development of the project-specific web portal (as set out in term and condition #12 of Project Certificate No.: 005) be undertaken, to include capability to support oral Inuktitut communications.

### **3.4.12 Hamlet of Pond Inlet**

The Hamlet of Pond Inlet attended and provided technical comments with respect to the Early Revenue Phase Proposal in Iqaluit on November 26-28.

At the Public Hearing, the Hamlet of Pond Inlet emphasized the following:

- Assessment and monitoring for the project should demonstrate respect for Inuit Qaujimajatuqangit and the perspectives of the community;
- The Project needs to recognize that:
  - All research, decision-making and monitoring affecting the community must include the residents;
  - Unimpaired access to the country food is required to nourish bodies and souls;
  - The maintenance of traditional skills and access to materials to keep safe and warm must be preserved;
  - It must be remembered that Inuit are the most HIGHLY SIGNIFICANT part of the Baffinland project;
  - The project is taking place in our home and it will be our home forever and needs to be properly protected; and
  - Terms and conditions must support both traditions and our future

- These comments must be considered to ensure that our land, water, animals and people are kept safe, healthy and happy.

### **3.4.13 Mittimatalik Hunters and Trappers Organization (MHTO)**

The MHTO is a Hunters and Trappers Organization established under Article 5, Part 7 of the Nunavut Land Claims Agreement (NLCA) to oversee the exercise of harvesting amongst the MHTO's membership. As described by the MHTO, the focus of their comments on the Early Revenue Phase Proposal was on possible impacts to narwhals and char and issues with respect to the ability of hunters to access areas farther from the community to harvest wildlife. In addition, the MHTO also raised questions regarding Baffinland's policies with respect to limits on Inuit employees' harvesting rights. The MHTO provided technical comments to the NIRB and participated in the meeting of technical experts in Iqaluit on November 26-28, 2013 to ensure that the MHTO was able to ask questions and get clarification regarding the aspects of the ERP that have the potential to affect hunters, harvesting rights and harvesting quotas.

At the Public Hearing, the MHTO specifically made the following submissions to the Board:

- Noting that Project Certificate terms and conditions #62 and 124 must respect Inuit harvesting rights for Inuit employees and Inuit in general and must reflect the NLCA and the Inuit Impact Benefits Agreement;
- Seeking compensation for hunters for the additional gasoline and supplies required because hunters have to travel farther to use hunting grounds outside the area of the mining project and are having to avoid the area of the Tote Road;
- Expressing concern that due to damage that occurred when two MHTO cabins were moved, one in Milne Inlet and the other in Mary River, the cabins cannot be used at this time, and as such, the MHTO requests that these cabins be replaced;
- Indicating that the MHTO must be involved in the development, implementation and evaluation of monitoring of the ERP (specifically in relation to land, air and water for Milne Port and transportation routes in determining the impact to terrestrial and marine animals and their habitat) because a full understanding of the ecosystemic effects of the ERP cannot be understood at this time;
- Noting that the MHTO's involvement in monitoring programs is essential as the monitoring programs inform mitigation plans, wildlife management plans and the delivery of compensation programs for which the MHTO is responsible;
- Identifying that the timing of the open water shipping will be such that the MHTO expects to see an impact to the char population, particularly in the Koluktoo Bay area;
- Expressing concerns regarding shipping near Button Point and through Navy Board Inlet and indicating that only Coast Guard and merchant vessels should be allowed to traverse through Eclipse Sound on the way to Milne Inlet;

- Expressing concern that shipping commencing in July could affect seal pupping activities and adversely impact seal pups that have not yet been weaned; and
- Identifying that the MHTO expects that because hunting will be adversely impacted, that the MHTO will lose revenues gained when the MHTO purchases the harvest and indicating that the MHTO should be compensated by Baffinland for this loss.

### **3.4.14 Local Communities Represented**

The NIRB invited five (5) community representatives from each of the eight (8) communities identified as being potentially affected to attend the Public Hearing in Pond Inlet. Community organizations were contacted in order to solicit representatives from broad demographic groups to participate, including local women's groups, Hunters and Trappers Organizations, Elders' societies, Hamlet Councils, and youth groups. Where no local group existed, the NIRB sought advice from regional associations and organizations in order to confirm participants for the Public Hearing.

A total of 38 community representatives from Arctic Bay, Clyde River, Grise Fiord, Hall Beach, Igloolik, Iqaluit and Resolute Bay, as well as the local Pond Inlet community representatives participated in the community roundtable portion of the Mary River Early Revenue Phase Public Hearing.

The format of the Public Hearing allowed the community representatives to observe the technical presentations of Baffinland and Intervenor over the first two days of proceedings. Community representatives attended these first days as well as the final three days which were dedicated to community roundtable sessions. During these roundtable sessions, community representatives from each community were invited to sit at the table with the Board to hear shortened presentations by Baffinland and Intervenor which explained project components in detail. Community representatives were then invited to pose questions to Baffinland and/or Intervenor and to provide their comments and offer their perspectives to the Board directly. These sessions were well attended and had all seats at the roundtable filled with community representatives.

Key issues and concerns expressed by community representatives at the public hearing are highlighted in the table below, with specific comments noted in greater detail throughout Sections 4 through 6 of this report in relation to particular effects. Full transcripts from the public hearing are also accessible online from the Board's public registry: [www://ftp.nirb.ca](http://www://ftp.nirb.ca).

**Table 1: Key Issues as Raised by Community Representatives**

Subject	Issues/Concerns/Comments
<b>ECOSYSTEMIC EFFECTS</b>	
Climate (including climate change)	<p>Will melting permafrost (and potentially increased melting due to project effects) result in more of our lakes and streams flowing into the ocean?</p> <p>How will the tote road be monitored and managed to address any sinking ground or other type of damage to the road resulting from the loss of permafrost?</p>
Air Quality	<p>Can dust be managed from the transportation along the tote road to ensure that people and animals are not affected?</p> <p>Will there be more asthma and breathing problems amongst the people travelling on or leaving near the tote road?</p> <p>How do you monitor to see how far dust deposited on ice after blasting ends up travelling?</p> <p>Will running diesel generators and diesel trucks result in the release of black “soot” into the air and onto the snow and if so, are the substances released dangerous to human health?</p> <p>Will truck traffic on the tote road be required to observe speed limits to reduce the release of dust?</p>
Noise and Vibration	Noise effects associated with shipping and the unknown effects on marine mammals
Landforms, Soils and Permafrost	<p>What are the reclamation requirements for the site and does the ERP change the plans for reclamation?</p> <p>Will barriers being placed along the side of the road being constructed for safety purposes pose a hazard for hunters travelling along the road?</p> <p>When was the tote road last upgraded?</p>
Vegetation	Potential for contamination of vegetation due to dust emissions, etc. (and subsequently affecting the food chain)
Freshwater Quality and Fish	<p>Will garbage and sewage be shipped out or left behind at the site?</p> <p>When they widen the road will there be extra culverts added and possibly bridges and if so can these new features be designed to improve fish passage?</p>

Subject	Issues/Concerns/Comments
	<p>What will the effects on water quality and fish be due to the use of explosives and associated releases of dust in to the air and onto the ice and water?</p> <p>What is “HADD” and what has it been replaced with under the new Fisheries Act amendments?</p> <p>Will there be more sand and gravel used on the road to make it less slippery and if so, how will Baffinland prevent the sediment from flowing into the nearby water when the snow melts?</p>
Terrestrial Wildlife and Habitat	<p>Communities do not want to see tagging of terrestrial animals such as caribou and polar bears in order to study these animals and monitor the effects of the project when it is active</p> <p>Concerns that there will be effects on caribou movement and mortality and unpredictable cumulative effects</p> <p>Will helicopters continue to be used during the ERP and if so, how will impacts on terrestrial wildlife be prevented</p> <p>Have the effects of blasting and construction on small animals such as lemmings, weasels, ptarmigan and snow buntings been considered?</p> <p>Can the project be terminated, suspended or stopped if the impacts on wildlife become unacceptable and Inuit experience hardship as a result?</p>
Birds	<p>Potential effects on sea birds due to increased intensity of shipping</p> <p>Will the proposed park area restrict development around the murre nesting areas?</p>
Marine Environment, Water, Ice and Sediment	<p>Will Pond Inlet now be monitored to see whether the release of ballast water is affecting water quality or identify if the ballast water is introducing invasive species?</p> <p>Effects on water quality associated with blasting, dredging and other activities required to make the port and build the dock</p> <p>What is the “open water” season in this area and what will happen if ice continues to be in and around the project area during that time period?</p> <p>Concern that ore loading dock may result in more widespread effects on marine water and sediment quality in the area than predicted in the FEIS Addendum</p>

Subject	Issues/Concerns/Comments
	<p>What type of surficial environmental impacts (such as erosion of important shore habitat and near-shore habitat in ecologically sensitive areas) have been considered?</p> <p>Are ballast water standards appropriate for Arctic environments?</p> <p>Will ships have to refuel enroute to Milne Inlet and if so, where?</p> <p>Where will the ore ships (and ballast) be coming from?</p>
Marine Wildlife and Marine Habitat	<p>Impacts of 54 transits through Eclipse Sound on marine mammals</p> <p>Concerns that ships passing too close to Button Point may impact seals that move inland in April and are particularly vulnerable to disturbance in June, July and August during mating/ pupping/ calving</p> <p>Requests to suspend shipping in certain areas (pupping/calving/denning) during times when marine mammals are particularly vulnerable to disturbance</p> <p>Concerns that use of navigational aids (sonar in particular) may impact marine wildlife</p>
Marine Wildlife and Marine Habitat (continued)	<p>Narwhal have been observed to swim away from ships—is it expected that they will abandon the area when more and more ships are active here?</p> <p>Will there be monitoring of effects on marine wildlife that may take place outside Milne Inlet and Steensby Inlet to identify when narwhal or seal may be moving to other places such as Grise Fiord?</p> <p>Proper monitoring must be required to ensure that the shipping does not affect the migration routes of marine mammals</p> <p>Can the ships slow to 6 knots upon entry to the Inlet to have less impact on marine mammals?</p> <p>Animals such as walrus, ringed seals and bearded seals become habituated to ships when ships move slowly enough</p> <p>Have the noise effects on mammals been modelled?</p> <p>Can you reduce the number of ships to reduce the effects of ships passing each other?</p>

Subject	Issues/Concerns/Comments
	<p>It was the experience of Nanisivik that during shipping for that project (May to October) the whales went away for a brief time and then returned when they became habituated to the ship traffic</p> <p>Communities do not want to see tagging of marine wildlife in order to study/monitor marine wildlife and the potential for effects on that wildlife</p> <p>Concerns that the proposed shipping route has an area that is subject to fog and also has been known to gather icebergs, suggested that perhaps a lighthouse or some kind of siren may be required to serve as a warning to people camping/boating in the area that a large ore ship is approaching</p> <p>Can marine mammals (including their hearing) be permanently damaged by blasting, dredging and other activities required to make the port and build the dock?</p> <p>Concern that once shipping commences through Milne Inlet that Steensby Inlet won't end up being developed and all shipping will end up going through Milne Inlet</p> <p>When the Proponent changed the project to the Northern Shipping route, what animals were included in the assessment?</p> <p>Shipping associated with ERP is biggest concern for most residents as effects on marine mammals and fish such as char (which are relied on by residents) is unclear and the proposed duration of 21 years may mean that these impacts continue for a long time</p> <p>Have seals in areas where there is considerably more shipping (e.g. Newfoundland coast) been impacted by that shipping or not?</p> <p>Is there evidence from other marine environments where mining and shipping are common that shows that fish and mammal populations have declined?</p>
Marine Wildlife and Marine Habitat (continued)	<p>Are there any foreign animals species (such as barnacles, etc.) that may be detrimental to the environment of Milne Inlet that could be transported with the ships?</p> <p>What studies have been undertaken to assess the likely mortality to schools of cod or other fish caused by the propellers on the ore carriers?</p>



Subject	Issues/Concerns/Comments
	<p>Open water season is exactly the timing when many different species converge in the area for critical phases in their lifecycle, mating, denning, birthing, etc. and effects at these critical points could have detrimental and lasting effects on populations</p> <p>Have concerns relying on analogous studies of reaction to shipping disturbance by other species of whales in warm water/southern environments—question whether these analogues are truly appropriate and tell us anything</p>
<b>SOCIO-ECONOMIC EFFECTS</b>	
Population Demographics	<p>Question why the Government of Nunavut policy is to not have the mine site become a community with people's families being able to live in the area, schools, health care facilities, etc. rather than having a fly in and fly out camp environment</p>
Education and Training	<p>How will Inuit be able to become supervisor and senior managers if they lack education and don't have the same opportunities to get training and advanced education as other employees?</p> <p>Training needs to include how to live well and how to spend/save money wisely</p> <p>Concerns that high school students will drop out of school to work at the mine—how can this be prevented?</p> <p>Is there a plan in place and being implemented to ensure that requirements of the Inuit Impact Benefit Agreement with respect to education and training are complied with?</p> <p>How will the project build capacity within communities that will outlast the short term economic benefits of the project?</p> <p>Is there an Inuit education and training strategy in place, and if so, what are examples of some of the activities associated with implementing the strategy?</p>
Livelihood & Employment	<p>How will North Baffin residents in particular be given priority to access job opportunities?</p> <p>Grateful for the job opportunities associated with the project, particularly for elders or other community members who cannot or do not want to leave their communities to find work</p> <p>Have already seen benefits from the project for young people in particular, but also some older people as well</p> <p>Will the Proponent ensure that employees from all communities</p>

Subject	Issues/Concerns/Comments
	<p>have transportation to and from their homes to the airport to catch their flights to Mary River (this is a concern in many communities where there is no taxi and no other type of reliable transportation to and from the airport)</p> <p>Can the proponent ensure that the camps are a safe environment for women?</p> <p>This project can create an unprecedented opportunity to create jobs were there are none</p> <p>Focus of hiring for ERP should be in Pond Inlet and Clyde River</p> <p>If employees are terminated for cause (e.g. oversleeping, not listening to supervisors) will they be permanently dismissed or could they be reconsidered for employment at the mine after some time has passed?</p> <p>Is the two week in and two week out rotation a permanent structure or only when the mine is under construction?</p> <p>What type of employment is available in the summer for students? Does Baffinland have a mandatory retirement age?</p> <p>Young people need to be ready to work and get jobs at the mine</p>
Economic Development & Self Reliance	<p>Concerns regarding the effect of increases in income causing increases in rental rates for government housing creating a disincentive for working at the mine – how is that being addressed?</p> <p>Why isn't the development of seasonal shipping via Steensby Inlet appropriate for "early revenue"?</p> <p>What happens to the main project if the ERP is not approved?</p> <p>Can the ERP have a limit in terms of time (e.g. 5 years) so that there is no danger that it becomes the main shipping route for the big project?</p> <p>Isn't the ERP very similar to the previous bulk sampling program— what are the key differences?</p> <p>Is the financing for the ERP in place and/or looking positive and what happens if the Project Certificate is amended but financing for the ERP cannot be secured right away?</p>

Subject	Issues/Concerns/Comments
	<p>What happens if the ERP fails to deliver measurable financial benefits to the Proponent and stakeholders?</p> <p>Will this shipping increase the likelihood of the Northwest Passage being opened up to more shipping?</p> <p>Is there any mechanism for employees to invest a percentage of their income to rely on later after they have left the mine?</p> <p>After all the plans made by Inuit in the past to ensure that the Inuit share in the revenues associated with developing Mary River it is good to see the development finally come forward</p> <p>The North Baffin has already experienced positive economic benefits from the project; if the ERP isn't approved the North Baffin stands to lose employment, training opportunities, contracting opportunities and benefits provided under the Inuit Impact Benefit Agreement</p> <p>If the ERP is approved, when will the construction of the railway commence (or will the ERP be it)?</p> <p>Does Baffinland have a specific Inuit employment strategy?</p>
Human Health and Well-Being	<p>Professional social workers needed to support mine employees and the families they leave behind in communities</p> <p>Need to be prepared for potential for increased drugs and alcohol use/dependency and associated social problems</p> <p>Will the Proponent ensure that in addition to elders available to personnel at the mine that there will also be trained professional staff to support employees and the families that are left behind when their spouse/partner/parent is working away from home?</p> <p>How will the mental health of employees and their families be taken care of</p>
Community Infrastructure and Public Services	<p>How will the project support the development of community infrastructure such as roads, docks and airports in the communities most affected by the negative project effects?</p> <p>Will there be any means of support for expanding child care opportunities (including subsidies for paying in home care such as a nanny for couples who want to both work at the mine)?</p>

Subject	Issues/Concerns/Comments
	<p>When the mine ceases operation what will be done with the trucks used to transport ore, will they be shipped south or will they be given to adjacent communities and also what will happen with heavy equipment used on-site?</p> <p>Would like to see project development revenues invested in infrastructure such as airport improvements and dock facilities for the communities closest to the project sites (Pond Inlet)</p> <p>Is there a mechanism for the residents of Pond Inlet to vote on the shipping through Milne Inlet?</p> <p>How often does the jet from the south fly into the site?</p> <p>Some benefits payments should be dedicated to paving roads in communities to limit the dust</p>
Contracting and Business Opportunities	<p>How will contracting opportunities be supported for elders and youth as well as existing businesses?</p> <p>Are contracts being given out already associated with this project, as the communities have not seen very much to date?</p>
Culture, Resources and Land Use	<p>The land around Mary River is not being used by people anymore to go camping, fishing or caribou hunting because of the activity of the mine site and exploration</p> <p>Concern that the lifestyle associated with being employed at the mine will change the culture and will limit the development of traditional skills</p> <p>How will the Proponent ensure that the culture of Inuit employees is respected and supported and that southern employees are required to respect Inuit employees?</p> <p>Secure employment makes it much easier to have the equipment needed to do traditional activities on the land</p> <p>It should be remembered that when southern employees are finished at the mine they will go home, but community residents working at the mine will stay because this is their home, and their parents' home, their grandparents' home and their childrens' home and their grandchildrens' home</p> <p>Can terms and conditions in the Project Certificate be included that better reflect Inuit laws as well as the laws of Canada?</p> <p>Can carvers get soapstone from Baffinland if Baffinland ends up</p>

Subject	Issues/Concerns/Comments
	having to remove soapstone from the area?
Benefits, Royalties and Taxation	<p>Now that ERP is being considered and Pond Inlet will be more impacted than other communities such as Igloolik (at least initially) will the QIA have to renegotiate the benefits payments under the Inuit Impact Benefits Agreement?</p> <p>Given that the ERP shifts the impacts from Igloolik to Pond Inlet, the residents of Pond Inlet should have more say in the negotiation of subsequent terms and conditions in the IIBA negotiated with the Proponent if the ERP is approved</p> <p>What is the exact life of mine if the ERP were to go ahead?</p> <p>How will benefits be distributed to communities most impacted by the ERP (Pond Inlet, Clyde River)?</p> <p>Does the Inuit Impact Benefit Agreement include valuation for impacts on the right to quiet enjoyment of Inuit Owned Lands around Milne Inlet and Pond Inlet?</p> <p>How will communities be compensated for defensive kills or other mortality of polar bears?</p> <p>If a polar bear is killed near a community will that affect the communities' polar bear quota?</p> <p>Could airplanes going through Pond Inlet from the south be used to haul personal cargo for residents?</p> <p>Concern that there is an imbalance between the economic infrastructure benefits of the project and the long-term environmental impacts</p>
<b>OTHER ISSUES</b>	
Accidents and Malfunctions	<p>Communities wonder whether Proponent's emergency response personnel and equipment could be made available to nearby communities when needed</p> <p>If an ore carrier were to sink, what would be the effect on the marine environment if all that iron ore would be released into the water?</p> <p>Are all the rubber fuel bladders at the site going to be removed and replaced with proper fuel tanks?</p>

Subject	Issues/Concerns/Comments
	<p>How will ships manage if there is a large fuel spill?</p> <p>How will ships navigate to avoid icebergs and ice that is not visible above the surface of the water?</p> <p>It is unclear who is responsible for immediate emergency response in the event of an accident at the Pond Inlet airport (especially a concern during shift change when large numbers of people may be going through the airport)</p>
Cumulative Effects	Have the potential effects of the ERP been considered in combination with the significant increase in the number of cruise ships that the area is seeing and that are likely to continue over the next few years?
Community Engagement	<p>How have youth been consulted directly about the project and potential project benefits?</p> <p>Some community members are shocked to hear that the ERP is expected to continue for the entire life of the mine (21 years) as this was not clear in Baffinland's communications with the community</p>
Inuit harvesting	Seeking clarification regarding rights of Inuit employees to harvest wildlife at the mine site during their off hours
Monitoring	<p>Can third party monitors be hired so that they can report more objectively than if they are employees of Baffinland?</p> <p>Can assessment and monitoring programs of Baffinland and regulators include elders and Inuit in these programs not just in the monitoring aspects but also in the interpretation of the results?</p>
Operational Flexibility	What does operational flexibility mean and why is Baffinland requesting 20% as the required flexibility for shipping and trucking?

Baffinland= Baffinland Iron Mines Corporation; ERP= Early Revenue Phase; QIA= Qikiqtani Inuit Association

## **4. ECOSYSTEMIC EFFECTS**

### **4.1 Meteorology and Climate (including Climate Change)**

#### **4.1.1 Views of the Proponent**

The Final Environmental Impact Statement Addendum (FEIS Addendum) considers the same regional study area (RSA) and local study area (LSA) as the FEIS for the approved Mary River Project. The RSA for climate and climate change includes the terrestrial and marine RSAs, while the climate change LSA includes the entire North Baffin Region.<sup>41</sup> Identified sources of emissions associated with the Early Revenue Phase (ERP) Proposal include vessel traffic in Milne Inlet and Eclipse Sound, vehicle traffic, drilling, blasting and crushing of aggregate from rock quarries, construction of culverts and bridges along the Milne Inlet Tote Road, and Milne Port construction activities, drilling, blasting and crushing of aggregate from rock quarries and dock construction.<sup>42</sup>

The predicted levels of greenhouse gases (GHGs) for the life of the ERP Proposal associated with emissions from project equipment were found to account for 11.4 million tonnes (Mt) of carbon dioxide (CO<sub>2</sub>) and, for upstream and downstream activities such as air travel and shipping activities for the ERP, emissions were predicted to be 8.6 Mt CO<sub>2</sub>. The ERP Proposal would contribute significantly to Nunavut's total GHG emissions, increasing emissions from 105% to 203%, while total annual GHG emissions from the ERP would represent 2.98% of the current total GHG emissions from mining in Canada. This portion also represents 0.10% of Canada's total emissions and 0.002% of global emissions. The FEIS Addendum states that because the ERP would be one of the largest developments in Nunavut, annual GHG emissions for the proposed project would be more than double the 2008 territorial emissions; but that on a national level, the emissions from the ERP would be very small, and globally, the Project's emissions would be considered insignificant.<sup>43</sup>

#### **4.1.2 Views and Concerns of Interested Parties**

Environment Canada (EC) indicated within its final written submission to the Board that it appeared that Baffinland had not updated its Air Quality and Noise Abatement Management Plan to include the proposed additional ERP shipping activity at Milne Port. EC recommended that the plan be updated to include the additional shipping activity at Milne Port proposed as part of the ERP.<sup>44</sup>

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<sup>41</sup> FEIS, Volume 5, Section 1.0.

<sup>42</sup> FEIS Addendum, Volume 5, Section 2.3.

<sup>43</sup> FEIS Addendum, Volume 5, Section 1.3.

<sup>44</sup> Environment Canada, Final Written Submission, January 14, 2014.

Within its final written submission to the Nunavut Impact Review Board (NIRB) the Qikiqtani Inuit Association (QIA) recommended a minor revision to term and condition 1 of the existing Project Certificate, to require the use of tidal gauges at Milne Port to monitor relative sea levels and storm surges with the objective of providing feedback on the impacts of climate change on the port facilities.

### **4.1.3 Views of the Board**

The Board agrees with EC that the Proponent's assessment of predicted GHG emissions from the ERP Proposal appears to be deficient and requires that the Proponent reassess the predicted GHG emissions associated with the ERP shipping and implement appropriate monitoring to determine if predictions were accurate or if additional mitigation measures may be required to mitigate any potential negative impacts of ERP components.

### **4.1.4 Conclusions and Recommendations of the Board**

Terms and conditions 1 through 6 of the existing Project Certificate address Meteorology and Climate (including Climate Change).

The following existing terms and conditions require no changes but should be applied to the ERP: 2-6.

The following existing terms and conditions require minor revision and should be applied to the ERP: 1.

**Condition 1:** revised to explicitly include monitoring and installation of tidal gauges at Milne Inlet Port site pursuant to recommendations of the QIA and the Proponent.

There are no new terms and conditions to be added to the Meteorology and Climate (including Climate Change) section.

## **4.2 Air Quality**

### **4.2.1 Views of the Proponent**

The air quality effects assessment in the Final Environmental Impact Statement (FEIS) Addendum identified potential changes or effects to existing air quality conditions and dust, metal, nitrogen, sulphur and potential acid input (PAI) deposition levels that may result from Project activities. All major Early Revenue Phase (ERP) Proposal components would operate year round with the exception of shipping to and from Milne Port which would occur during the open water season only. The Proponent's assessment took into consideration ERP activities at the Milne Port, Milne Inlet Tote Road and the mine site during the construction and operations phases.

The air quality effects assessment found that concentrations in excess of the thresholds for the ERP Proposal were generally predicted to be confined to the Local Study Area (LSA) and that these effects were fully reversible. The residual air quality effects for the ERP were predicted to be not significant.



The effects assessment also identified total suspended particulates (TSP), metals, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations at Milne Port and the mine site as potential concerns.<sup>45</sup>

The FEIS Addendum concluded that the use of dust suppressants during the summer months, together with snow-cover as a natural dust suppressant during the winter months, could be assumed to provide a 66% overall reduction in potential dust emissions.<sup>46</sup> Baffinland further clarified the additional mitigation of using larger aggregate materials on the Milne Inlet Tote Road in order to reduce the amount of dust produced from use of the road.<sup>47</sup>

## **4.2.2 Views and Concerns of Interested Parties**

EC indicated in its final written submission to the Board that, as was noted in its May 2013 technical comment submission, it did not appear that Baffinland had updated its Air Quality and Noise Abatement Management Plan to include the proposed additional ERP shipping activity at Milne Port. EC recommended that the plan be updated to include this additional ERP shipping activity and that Baffinland undertake continuous air quality monitoring at the ports and along the shipping routes. At the NIRB's Technical Meeting in Iqaluit in November 2013, Baffinland committed to conducting a minimum of 3 years of continuous monitoring of sulphur dioxide (SO<sub>2</sub>) and nitrogen oxide (NO<sub>x</sub>) at the port sites following the start of iron ore shipments, noting that it would review the continuation of the program based on monitoring results and consultation with EC. Baffinland also committed to re-visit the monitoring program should the Project change significantly.<sup>48</sup>

EC also noted within its final written submission that no explanation was provided in the FEIS Addendum as to why the dust deposition threshold level had been increased in the FEIS Addendum (60g/m<sup>2</sup>/year) from that used in the FEIS (55g/m<sup>2</sup>/year), recommending that the dust deposition threshold be defined, justified and linked to potential impacts to receptors such as plants, wildlife and water quality.<sup>49</sup> In Baffinland's response to EC's technical review comments, it acknowledged the inconsistency with the dust deposition threshold and committed to providing clarification in its Dust Monitoring Plan.<sup>50</sup>

The Qikiqtani Inuit Association (QIA) and Hamlet of Pond Inlet also expressed concern regarding Baffinland's ERP dust modelling and the potential impacts of dust deposition on vegetation, affecting the health of caribou and other terrestrial wildlife, and in creeks affecting spawning of arctic char.<sup>51</sup> In addition, the Hamlet of Pond Inlet indicated that where Inuit Inuit Qaujimaningit (IQ) states that increased dust on creek and sea ice hastens the rate of melting, dust deposition monitoring should be included for ice cover at Phillips Creek and other fish-bearing freshwater bodies and sea ice in the

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<sup>45</sup> FEIS Addendum, Volume 5, Section 2.6.5, June 2013.

<sup>46</sup> FEIS Addendum, Volume 5, Section 2.6.1, June 2013.

<sup>47</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 235, lines 7-14.

<sup>48</sup> Environment Canada, Final Written Submission, January 14, 2014.

<sup>49</sup> Environment Canada, Final Written Submission, January 14, 2014.

<sup>50</sup> Baffinland, Final Written Submission, January 27, 2014.

<sup>51</sup> Hamlet of Pond Inlet, Final Written Submission, January 13, 2014 and the Qikiqtani Inuit Association, Final Written Submission, January 15, 2014.

vicinity of Milne Port.<sup>52</sup> At the Public Hearing for the ERP Proposal, Baffinland indicated that it had calculated the total suspended solid loadings in Phillips Creek and found that dustfall would result in negligible increased total solid loadings at the mouth of Phillips Creek.<sup>53</sup> In addition, Baffinland responded to the Hamlet of Pond Inlet's concern regarding the absence of dust monitoring stations within 15 metres of the Tote Road, noting that if these monitoring stations were located closer to the road that they would become safety hazards for traffic.<sup>54</sup>

### **4.2.3 Views of the Board**

The Board places a great importance on dust management, in particular dust management for increased traffic on the Milne Inlet Tote Road to minimize potential impacts on adjacent freshwater and marine habitats and species, on vegetation, on terrestrial wildlife through uptake of vegetation, and on human health through uptake of country food and safety through impairment of visibility. The Board also stresses the importance of the Proponent implements the dust emission control and monitoring measures referenced in the FEIS Addendum and during the Public Hearing for the ERP Proposal (including strict enforcement of speed limits, haul truck tarp covers, employment of acceptable dust suppressants and monitoring of dust deposition along the Tote Road) to reflect the significant increase in traffic, impacts may be adequately addressed. The Board feels strongly that dustfall monitoring is an essential part of ensuring adequate management of the potential direct impacts from dust deposition, on both vegetation and waterbodies, and associated indirect impacts through ingestion by wildlife harvested by local communities. These concerns are also addressed in Section 4.7 of this report regarding Vegetation.

The Board supports EC's request that the Proponent define and justify the dust deposition threshold level indicator to be implemented for the ERP Proposal and update its Air Quality and Noise and Abatement Management Plan accordingly.

The Board notes the concerns raised by the Hamlet of Pond Inlet regarding the determination of an appropriate setback for monitoring stations, however, the NIRB feels that a 15 metre setback from Milne Inlet Tote Road for dustfall monitoring may be appropriate given the evidence provided by Baffinland at the public hearing regarding safety on the road.<sup>55</sup>

Again, the Board emphasizes the importance of continuous air quality monitoring along the Tote Road and port sites to determine if the FEIS Addendum effects assessment predictions were accurate or if

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<sup>52</sup> Hamlet of Pond Inlet, Final Written Submission, January 13, 2014.

<sup>53</sup> M. Settingington, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 183, lines 2-7.

<sup>54</sup> M. Settingington, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 223, lines 1-6.

<sup>55</sup> M. Settingington, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 223, lines 1-6.

additional mitigation may be required to prevent adverse effects on vegetation, wildlife and humans within the Local Study Area and the Regional Study Area.

## **4.2.4 Conclusions and Recommendations of the Board**

Terms and conditions 7 through 12 of the existing Project Certificate address Air Quality.

The following existing terms and conditions require no changes but should be applied to the ERP: 11 and 12.

The following existing terms and conditions require minor revision and should be applied to the ERP: 7-10.

**Condition 7:** revised to focus monitoring at project port sites, including Milne Port and address EC's recommendation that continuous monitoring through several seasons rather than passive monitoring be implemented to determine if hourly exceedances occur.

**Condition 8:** revised to include monitoring of SO<sub>2</sub> and NO<sub>2</sub> emissions at Milne Port.

**Condition 9:** revised to include a requirement for the calculation of greenhouse gas emissions associated with Milne Port.

**Condition 10:** revised to include the Milne Inlet Tote Road and roads leading to the Tote Road in the Dust Monitoring and Management Plan.

There are no new terms and conditions to be added to the Air Quality section.

## **4.3 Noise and Vibration**

### **4.3.1 Views of the Proponent**

The FEIS Addendum effects assessment for noise and vibration concluded that the potential effects of noise and vibration from the ERP Proposal are not significant. Construction and operations activities at Milne Port associated with the ERP would have the potential to generate noise that would be audible up to 1.5 kilometres from the facility (maximum predicted noise level of 40 dBA) and may affect the aesthetic use of the eastern end of the beach by Pond Inlet residents or other users.<sup>56</sup> In addition, the predicted average hourly sound levels from truck traffic along the Tote Road were expected to be minor. The Milne Inlet airstrip would be primarily used during the construction phase of the approved Mary River Project and as such was not assessed in the FEIS Addendum for the ERP Proposal. The predicted

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<sup>56</sup> FEIS Addendum, Volume 5, Section 3.3.2.2.

worst case noise rating was at the accommodations building at a Balanced Noise Criterion (NCB) of 42, which was slightly above the recommended rating of NCB 40. Mitigation features will be incorporated into the design of the accommodations building to attenuate noise. As the duration of the effects from ERP construction activities would be short-term, occasional and reversible, the effect was anticipated to be insignificant.<sup>57</sup>

In regards to noise effects to marine mammals, the FEIS Addendum concluded that the residual disturbance effects which would result from ERP construction activities on ringed seals, bearded seals, walrus, belugas and polar bear would be of low magnitude, medium-term in duration, occurring infrequently (aircraft overflights; pile driving) to frequently (ERP shipping), confined to the LSA and fully reversible; therefore, the effects were predicted to be not significant.<sup>58</sup> The potential impact of ERP construction activities on narwhals and bowhead whales was found to be of low to medium magnitude, medium-term in duration, occurring infrequently (pile driving and aircraft overflights) to frequently (shipping) within the LSA, and would be fully reversible; therefore, the effects were predicted to be not significant.<sup>59</sup> Additionally, the FEIS Addendum concluded that during the operations phase, the area of avoidance of marine mammals could increase slightly when exposed to two or more ore carriers along the ERP shipping route or a number of vessels at Milne Port at one time; however, given the small increase in sound levels, the number of marine mammals exhibiting avoidance was predicted to be non-significant.<sup>60</sup>

No major sources of vibration were anticipated during ERP operations at the Milne Port and Milne Inlet Tote Road. Minor vibration effects would be expected to exist throughout ERP construction, but these effects would be confined to the LSA (areas directly surrounding Milne Port and Tote Road) and fully reversible.<sup>61</sup>

### **4.3.2 Views and Concerns of Interested Parties**

DFO expressed concern that exposure to shipping-related noise could result in a negative response by marine mammals that could range from temporary alertness to active avoidance of the area for short to prolonged period of time and could result in short-term to long-term changes in stress levels.<sup>62</sup> DFO recommended that Baffinland implement a well-designed monitoring plan to detect the impacts of ERP-related shipping and its magnitude on marine mammals, including effects to marine mammal distribution, habitat use, reproduction or health, in particular with respect to narwhal and bowhead whales. In addition, DFO recommended that Baffinland continue to collect marine mammal baseline data and acoustical data required to support their ERP marine mammal monitoring programs given the limited amount of data currently available. At the public hearing, Baffinland acknowledged uncertainty in the FEIS Addendum predictions about narwhal avoidance in response to ore carrier transits during the

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<sup>57</sup> FEIS Addendum, Volume 5, Section 3.3.3.2.

<sup>58</sup> FEIS Addendum, Volume 8, Sections 5.6.3.2, 5.6.3.6, 5.12.3.1, 5.7.3.2, 5.8.3.2, 5.3.9.2, 5.10.3.2 and 5.11.3.2.

<sup>59</sup> FEIS Addendum, Volume 8, Sections 5.9.3.2 and 5.10.3.2.

<sup>60</sup> FEIS Addendum, Volume 8, Section 5.7.3.6, 5.8.3.6, 5.9.3.4, 5.10.3.6 and 5.12.3.5.

<sup>61</sup> FEIS Addendum, Volume 5, Sections 3.3.5, 3.4.6.

<sup>62</sup> Fisheries and Oceans Canada, Final Written Submission, Submitted to the NIRB, January 13, 2014.

open-water period, and further committed to rigorous monitoring of effects of shipping on narwhals, bowhead whales and other marine mammals.<sup>63</sup>

The Hamlet of Pond Inlet echoed DFO's recommendation that additional baseline data be collected on marine mammals to determine the potential effects of ERP shipping along the northern shipping route and recommended that monitoring locations include Eclipse Sound, Milne Inlet and Koluktoo Bay and that additional acoustical data for Milne Inlet be collected.<sup>64</sup> The Hamlet also disagreed with the conclusions for the noise effects assessment in the FEIS Addendum on marine mammals as the case studies for the assessment were based on southern species and are not applicable to the marine mammals in the ERP Proposal region.

The Qikiqtani Inuit Association (QIA) also disagreed with Baffinland's FEIS Addendum conclusions and found that insufficient information was provided on the proposed monitoring of effects of ERP activities on narwhal or mitigations to minimize impacts of frequent ore carrier transits through Milne Inlet.<sup>65</sup> In addition, QIA noted that there is increasing evidence of cumulative impacts of marine noise on marine mammals and recent studies have shown that cumulative noise levels can be pronounced in narrow fiord systems and that with the proposed level of ERP shipping, a temporary avoidance of ships that occurs on a regular basis (as would be the case with ERP shipping), could turn into chronic disturbance with cumulative effects. The QIA recommended that Baffinland should conduct verification studies to assess the accuracy of its sound propagation models and associated zones of impact, as well as work with the QIA, Inuit in impacted communities and other interested parties via the Marine Environment Working Group (MEWG) to develop a robust monitoring plan that identifies monitoring tools, the establishment of acceptable levels of impact thresholds and mitigation steps to be employed.

The Hamlet of Pond Inlet voiced its concerns in their final written submission to the Board regarding noise generated by the ERP Proposal that would potentially be produced at Milne Port during a critical window both environmentally (sensitive period for whales, seals and char, etc.) and culturally (subsistence hunting, open water travel, family camping in the region).<sup>66</sup> The Hamlet recommended that no invasive work be conducted in the Milne Port marine environment during the month of August when a significant number of environmental and cultural activities occur in the Milne Inlet region.

Parks Canada also commented on the potential for noise intrusion from ERP aircraft activities (primarily transporting equipment and personnel to the Project) on users of the Sirmilik National Park, in particular the regions of Oliver Sound and Paquette Bay which are located in the ERP's flight path.<sup>67</sup>

### **4.3.3 Views of the Board**

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<sup>63</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 82, lines 1-7.

<sup>64</sup> Hamlet of Pond Inlet, Final Written Submission, January 13, 2014.

<sup>65</sup> Qikiqtani Inuit Association, Final Written Submission, January 13, 2014.

<sup>66</sup> Hamlet of Pond Inlet, Final Written Submission, January 13, 2014.

<sup>67</sup> Parks Canada, Final Written Submission, January 14, 2014.

The Board notes the importance of possessing adequate baseline data which is required to effectively inform mitigation and monitoring plans. In the case of marine mammal species in Milne Inlet where insufficient baseline data exists to confidently predict the potential impacts of anthropogenic noise in the project area, the Board is of the opinion that the collection of additional baseline data is required, including acoustical baseline in the Milne Inlet area, especially for narwhal and bowhead whales. The Board understands that public concern exists regarding the potential impacts of noise disturbance from construction activities in Milne Inlet as raised during the Public Hearing for the ERP, and agrees that a precautionary approach to work in this area is required.

The Board noted the significant public concern associated with the proposed ERP construction work in Milne Port during the open water season, and while the Board is uncomfortable with imposing explicit seasonal restrictions on project activities, the Proponent will be required to demonstrate its consideration for limiting when project activities that have the potential to disrupt marine mammal species in the Local Study Area (LSA) such as pile driving, for example, are undertaken. Further, the Board notes that the significant levels of air, road and marine traffic related to ERP operations have the potential to produce noise and sensory disturbance to wildlife and other users of project areas, including aircraft and helicopters related to ongoing exploration and employee transport, truck traffic on the Milne Inlet Tote Road while transporting iron ore, and marine vessels at Milne Inlet also transporting ore and other freight during the open water period. The Proponent will also be required to demonstrate its consideration for limiting these effects throughout project operations.

The Board also notes with respect to terrestrial noise sources, the noise effects assessment presented within Baffinland's FEIS Addendum did not include consideration for the significantly increased ERP activities along the Milne Inlet Tote Road to potentially act as a deterrent to caribou movement and feeding in project areas. For additional information regarding interactions between ERP components and caribou in the LSA, please refer to Section 4.9.

#### **4.3.4 Conclusions and Recommendations of the Board**

Terms and conditions 13 through 15 of the existing Project Certificate address Noise and Vibration.

The following existing terms and conditions require no changes but should be applied to the ERP: 13 and 14.

The following existing terms and conditions require minor revision and should be applied to the ERP: 15.

**Condition 15:** revised to include reference to the Milne Inlet Tote Road and project-related shipping.

The following new terms and conditions are to be added to the Noise and Vibration section:

1. The Proponent, through coordination with the MEWG as may be appropriate, shall demonstrate appropriate adaptive management for construction activities at Milne Inlet that have the potential to disrupt marine mammal species, including pile driving and ore dock construction, are undertaken.

2. The Proponent, through coordination with the TEWG as may be appropriate, shall demonstrate appropriate adaptive management for project activities during operations which have the potential to produce noise and sensory disturbance to wildlife and other users of project areas.

## **4.4 Hydrology and Hydrogeology**

### **4.4.1 Views of the Proponent**

The Final Environmental Impact Statement (FEIS) Addendum concluded that the Early Revenue Phase (ERP) would result in minor changes in water withdrawal volumes due to changing camp occupancies (increased camp population at Mary River and longer duration of Milne Port camp). The degree of change to freshwater quantity due to the addition of the ERP relative to that presented in the FEIS for the Approved Mary River Project is minor and the effects are predicted to be not significant.<sup>68</sup>

Regarding water diversion, the ERP would also involve minor diversions at Milne Port to segregate and collect runoff from the proposed ore stockpile and, given that the diverted runoff from the stockpile would flow to Milne Inlet in the absence of the ERP, this minor diversion was not assessed in the FEIS Addendum.

The ERP would result in additional discharge of mine effluent from the proposed ore stockpile at Milne Port and minor changes in the volume of treated sewage effluent discharged to receiving waters at the mine site during construction and operation. During construction, the approximately 22.5% increase in the volume of discharge of treated sewage for the ERP is determined to have a negligible impact.

At the Public Hearing for the ERP Proposal, Baffinland confirmed that it does not intend to establish a camp along the Milne Inlet Tote Road and as such, there would be no changes to the water withdrawal rates, diversion or discharges for the ERP Proposal.<sup>69</sup>

Baffinland also noted at the Public Hearing that the upgrades to sea can crossings along the Milne Inlet Tote Road are regulated by Baffinland's Fisheries Act Authorization with Fisheries and Oceans Canada (DFO) and that DFO had reviewed and approved the culvert crossing upgrades and the respective mitigation and monitoring requirements.<sup>70</sup>

### **4.4.2 Views and Concerns of Interested Parties**

The Qikiqtani Inuit Association (QIA) noted its concerns at the Nunavut Impact Review Board (NIRB) Technical Meeting in Iqaluit in November 2013 as well as in its final written submission to the Board

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<sup>68</sup> FEIS Addendum, Volume 7, Section 2.3.3.1.

<sup>69</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, pp. 186-187, lines 23-26 and line 1.

<sup>70</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 182, lines 9-18.

regarding the possible establishment of a construction camp located at the mid-point of the Milne Inlet Tote Road for the ERP, as the FEIS Addendum did not include any impact predictions for this proposed camp.<sup>71</sup> However, as was noted in the preceding section, Baffinland has confirmed it is no longer going to establish a camp along the Milne Inlet Tote Road.<sup>72</sup>

### **4.4.3 Views of the Board**

The Board acknowledges the Proponent's confirmation that it will no longer be establishing a construction camp along the Milne Inlet Tote Road and that the design of the culvert upgrades for the Milne Inlet Tote Road have been approved by DFO. The Board is satisfied with the conclusions of the effects assessment in the FEIS Addendum for hydrology and hydrogeology.

The Board expects that the Proponent will continue to improve its monitoring programs and other initiatives to reduce the impacts of the ERP Proposal on the quantity and flow of water associated with the Project.

### **4.4.4 Conclusions and Recommendations of the Board**

Terms and conditions 16 through 19 of the existing Project Certificate address Hydrology and Hydrogeology.

The following existing terms and conditions require no changes but should be applied to the ERP: 17, 18 and 19.

The following existing terms and conditions require minor revision and should be applied to the ERP: 16.

**Condition 16:** amended to include diversion of runoff into watercourses from port sites.

There are no new terms and conditions to be added to the Hydrology and Hydrogeology section.

## **4.5 Groundwater/Surface Waters**

### **4.5.1 Views of the Proponent**

The Final Environmental Impact Statement (FEIS) Addendum concluded that the Early Revenue Phase (ERP) would have similar effects to water and sediment quality as were identified in the FEIS for the

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<sup>71</sup> The Qikiqtani Inuit Association, Final Written Submission, January 15, 2014.

<sup>72</sup> S. Williamson Bathory, QIA, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 220, lines 19-22.



approved Mary River Project. The management of ore and waste rock and associated runoff at the mine site would remain unchanged.

The addition of the ERP would result in an increased camp population at the mine site which would result in an increase in the volume of treated sewage discharged to Mary River and increased emissions to air resulting from the larger camp facility and the concurrent loading of trucks and railway cars from a common ore stockpile at the mine site.

Ore handling and stockpiling at Milne Port for the ERP would result in increased air emissions, which potentially could affect freshwater and sediment quality as most of the ore dust would be deposited in the marine environment or would fall onto land that drains to the ocean. However, as there are no fish-bearing streams that would be affected, the effects of ore dust on water and sediment quality in the freshwater environment was expected to be negligible. In addition, with ore stockpiled at Milne Port year-round, it was concluded that the runoff from the Milne Port stockpile area which would be collected in a stormwater pond before being discharged to the local ditch that drains to Milne Inlet would have a negligible effect on water and sediment quality.

Overall, the FEIS Addendum concluded that the addition of the following ERP Proposal components would not have any significant adverse effects on water and sediment quality:

- marginal increase in ground preparation and earthworks;
- runoff within Milne Inlet Tote Road;
- increased size of laydown areas;
- increased camp capacity at Milne Port and mine site;
- re-alignment of the airstrip at Milne Port;
- construction-related dust emission; and
- additional ore loading activity, transport, stockpiling and handling of ore along the Milne Inlet Tote Road and Milne Port.<sup>73</sup>

The FEIS Addendum concluded that while ERP activities could potentially increase the total suspended solids (TSS), nutrient, metal and hydrocarbon concentrations, no significant residual environmental effects on water quality are predicted. Exceedance of temperature or salinity thresholds might occur due to ballast water discharge, but the FEIS Addendum determined that these instances of exceedance are expected to be of moderate magnitude and fully reversible.<sup>74</sup>

The ERP is predicted to have no significant residual environmental effects on sediment quality. ERP activities could increase nutrient, metal, or hydrocarbon concentrations in the sediments, but the effects would be unlikely to cause exceedances of the CCME sediment quality guidelines.<sup>75</sup>

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<sup>73</sup> FEIS Addendum, Volume 7, Sections 3.4.2.1-3.4.2.3.

<sup>74</sup> FEIS Addendum, Volume 8, Section 3.6.

<sup>75</sup> FEIS Addendum, Volume 8, Section 3.6.

## 4.5.2 Views and Concerns of Interested Parties

In regards to the management of sewage discharge at Milne Port, at the Public Hearing for the ERP, Environment Canada (EC) recommended the following:

*...project wastewater streams be managed to avoid impacts to the receiving environment and flagged that the metal mining effluent regulations would not be applicable to sites that were located away from the mine itself. Baffinland clarified that mitigation would be in place to ensure wastewater from the airstrip did not impact surrounding water quality and accepted that the ore stockpile runoff would be subject to the general prohibitions of the Fisheries Act, rather than the metal mining effluent regulations.<sup>76</sup>*

EC further noted that nutrient inputs to Mary River from wastewater treatment facilities could have the potential to change the trophic status of the river and recommended that monitoring of the receiving environment include productivity measurements (i.e., chlorophyll A and nutrients) to ensure any changes to water quality could be identified and adaptive management implemented, if required.<sup>77</sup> At the Public Hearing for the ERP, EC indicated it was satisfied that the aquatic effects monitoring program (AEMP) for the project would include nutrient monitoring and that mitigation would be triggered if monitoring detects an issue.<sup>78</sup>

Within its final written submission to the Board the Qikiqtani Inuit Association (QIA) noted that the proposed dredging for the Milne Port dock construction could disturb bottom sediments and increase the biological availability of metals that are sequestered within the sediment. The QIA further stated that the potential for dredging associated with the ERP to mobilize metals such as cadmium and mercury that bio-accumulate in the marine food chain was not included in the effects assessment in the FEIS Addendum and should be assessed prior to the commencement of dock construction at Milne Port to inform sediment quality mitigation and monitoring.<sup>79</sup>

Natural Resources Canada (NRCan), in its final written submission to the Board, indicated that there is potential for ERP activities, including the construction of the ore dock, to potentially result in significant disturbance to sediments in the Milne Port area, including re-suspension and subsequent transport and deposition and interruption of alongshore sediment transport.<sup>80</sup> NRCan recommended that Baffinland conduct hydrodynamic modelling in the Milne Port region to confirm if there would be significant impacts to sediment transport and understand the potential for re-suspended sediment. NRCan noted

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<sup>76</sup> M. Dahl, Environment Canada, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, p. 421, lines 5-17.

<sup>77</sup> M. Dahl, Environment Canada, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, p. 421, lines 18-26.

<sup>78</sup> M. Dahl, Environment Canada, NIRB Public Hearing File No.: 08MN053 Transcript, January 30, 2014, p. 835, lines 15-22.

<sup>79</sup> The Qikiqtani Inuit Association, Final Written Submission, January 13, 2014.

<sup>80</sup> Natural Resources Canada, Final Written Submission, January 22, 2014.

that if it were determined that the ERP or dock construction were found by DFO to categorize “serious harm” to fish habitat, Baffinland would be required to develop a Fish Habitat Offset Program and this plan would include ongoing monitoring program.

### **4.5.3 Views of the Board**

The Board acknowledges the measures that have been developed and proposed by the Proponent for the ERP. However, the potential changes in surface water and sediment quality, groundwater distribution and flow paths that are directed or indirectly attributable to the facilities and activities associated with the Project remains a concern for the Board and will need to be assessed and monitored throughout the life of the ERP.

The Board agrees with QIA and NRCAN regarding the importance of assessing the potential for ERP components to impact sediment transport and release of metals that bioaccumulate in the marine food chain and recommends additional baseline characterization and establishment of an Environmental Effects Monitoring Program at Milne Port to confirm the FEIS Addendum predictions regarding potential impacts to water and sediment quality from ERP components.

### **4.5.4 Conclusions and Recommendations of the Board**

Terms and conditions 20 through 24 of the existing Project Certificate address Groundwater/Surface Waters.

The following existing terms and conditions require no changes but should be applied to the ERP: 20, 22, 23 and 24.

The following existing term and condition require minor revision and should be applied to the ERP: 21.

**Condition 21:** note that revisions have been included within the Freshwater Aquatic Environment Including Biota and Habitat VEC, Section 4.8.4 of this report.

There are no new terms and conditions to be added to the Groundwater/Surface Waters section.

## **4.6 Landforms, Geology and Geomorphology, Soils and Permafrost**

### **4.6.1 Views of the Proponent**

Early Revenue Phase (ERP) activities that were identified as having potential to destabilize or degrade thaw-sensitive landforms included:

- Milne Port: ground clearing for laydown areas, aggregate sources and new airstrip;

- Milne Inlet Tote Road: road realignment and development of quarries and borrow pits; and,
- Mine Site: ground clearing for additional facilities (camp and support buildings) and laydown areas.

The Final Environmental Impact Statement (FEIS) Addendum identified potentially thaw-sensitive soils that exist south of the Milne Port airstrip and outside of the existing facility footprint but within the location of the proposed airstrip expansion/extension. Proposed mitigation would include the use of geotextiles, ripraps and additional fill to prevent scour or other types of erosion.<sup>81</sup>

Potential effects of ERP activities identified in the FEIS Addendum included deposition of red ore dust confined to the immediate Milne Port area and upgrades to the Milne Inlet Tote Road which would cause increased dust.<sup>82</sup>

Additional impacts of the proposed ERP on the aesthetics of the natural environment at Milne Port would include increased truck traffic, ore stockpiling, ship loading and camp occupation, as well as a red ore dust footprint in the vicinity of ore stockpiling and handling areas.<sup>83</sup> Visual effects at the mine site would include the additional modification of Nulujaak as a landmark (mining of top of hill). The effects of the ERP will be moderate term (life of Project) with greater residual effects than previously assessed in the FEIS for the approved Mary River Project.

## 4.6.2 Views and Concerns of Interested Parties

In Natural Resource Canada's (NRCan) final written submission to the Board, NRCan noted:

*...construction and operation of infrastructure such as the Tote Road and facilities at the Milne Port site (including ore stock pile, drainage control), in permafrost environments can result in changes to the thermal regime of the ground resulting in landscape instability, erosion and changes to drainage that may have impacts on ecosystems. These changes to the physical environment such as ground instability, resulting from project activities can also have implications for infrastructure integrity and performance.*<sup>84</sup>

NRCan generally agreed with Baffinland's conclusions in the FEIS Addendum that with adequate engineering design for ERP facilities, environmental effects could be minimized. Baffinland acknowledged that remedial measures will be required during the upgrade of the Tote Road where sensitive landforms and ice-rich soils have been identified. In FEIS Addendum Volume 7, Baffinland

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<sup>81</sup> FEIS Addendum, Volume 6, Section 2.3.2.

<sup>82</sup> FEIS Addendum, Volume 6, Section 2.4.3.

<sup>83</sup> FEIS Addendum, Volume 6, Section 2.4.3.

<sup>84</sup> Natural Resources Canada, Final Written Submission, January 22, 2014.

indicated there will be a marginal increase in the amount of ground disturbance associated with the ERP activities, mainly at the Milne Port site.<sup>85</sup>

NRCan concluded that the addition of the ERP will likely result in extraction of increased amounts of sand and gravel from borrow areas for use in upgrading and maintaining the Tote Road given the proposed increased level of traffic along the road in the ERP.<sup>86</sup>

### **4.6.3 Views of the Board**

The Board is in agreement with NRCan that the proposed preventative and mitigation measures identified by the Proponent for minimizing the impacts to sensitive landforms, geological features, soils and permafrost for the ERP are, in the Board's view, satisfactory at this stage of the development process. The Board advises that the follow-up and complementary initiatives communicated by the Proponent in the FEIS Addendum are critical in ensuring that the mitigation measures proposed will be effective and adequately address potential impacts of the ERP related to sensitive landforms, geological features, soil and permafrost.

As noted in the Hearing Decision Report for the approved Mary River Project, the scope of the ERP for the Mary River Project is unprecedented in the region and the Board believes that the potential impacts on aesthetics( i.e. the beauty of the natural topography and landscape) deserves consideration throughout the life of the Project.

The Board is also of the view, as discussed in Section 4.11 of this report in relation to the Marine Environment, that there is potential for shoreline erosion resulting from wake effects from the proposed ERP northern shipping route. In addition, the potential for soil erosion, potentially resulting from upgrades to the Tote Road and Milne Port facilities will need to be closely monitored and remediated by the Proponent during the life of the ERP.

### **4.6.4 Conclusions and Recommendations of the Board**

Terms and conditions 25 through 30 of the existing Project Certificate address Landforms, Geology and Geomorphology, Soils and Permafrost.

The following existing terms and conditions require no changes but should be applied to the ERP: 25-30.

There are no new terms and conditions to be added to the Landforms, Geology and Geomorphology, Soils and Permafrost section.

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<sup>85</sup> Natural Resources Canada, Final Written Submission, January 22, 2014.

<sup>86</sup> Natural Resources Canada, Final Written Submission, January 22, 2014.

## 4.7 Vegetation

### 4.7.1 Views of the Proponent

The Proponent's consideration of the vegetation effects assessment pertaining to the Early Revenue Phase (ERP) Proposal focused on potential effects from Project interactions that had not been previously considered through the assessment of the approved Mary River Project, and included the construction, operation, and closure phases of the ERP development. The key components reviewed to assess the potential effects on vegetation included: the loss of abundance and diversity due to surface disturbance associated with ERP activities; potential effects on vegetation health from dust and atmospheric emissions; and the potential for effects on vegetation of cultural or practical value to Inuit.

As set out in the Final Environmental Impact Statement (FEIS) Addendum Volume 6, Section 3, Baffinland asserted that no changes to the impact statements from the previously submitted findings within the FEIS for the Mary River Project development were required for vegetation health, vegetation abundance and diversity, or culturally valued vegetation as a result of potential impacts from the ERP Proposal.

Volume 6 of Baffinland's FEIS Addendum noted that vegetation health was predicted to change as a result of the ERP activities, specifically considering dust deposition and atmospheric emissions.

Baffinland identified the following potential effects from the ERP Proposal on vegetation health, abundance, diversity and culturally valued vegetation:

*during construction, operation, and closure activities, annual dust deposition would be likely to occur above threshold levels outside of the project development area, and that there would be some effects on vegetation, limited to a small portion of vegetated areas in the regional study area (less than 0.01 % of the area), and small proportions of each vegetation class (0.0-1.6 %) relative to their individual availability in the area. Further, it was Baffinland's position that these effects would be reversible at such a time as the dust-producing activities cease.*

After Project closure, when the air emissions and nitrogen deposition cease, the effects of nitrogen additions to the ecosystems are predicted to persist. According to Baffinland, this could result in long-term effects on plant community composition and individual species resilience. Baffinland has predicted that those ERP-related effects would be limited to only small proportions (<0.1 %) of the more sensitive vegetation classes within the RSA.

Metals contained in dust would likely accumulate to some degree in soils beyond the project development area (PDA), with a small affected area in comparison to the Regional Study Area. Baffinland indicated that the bioavailability of metals for plants in the PDA would be expected to continue at low levels, thereby minimizing or preventing any potential phytotoxic effects, and further, that any effects would be small in extent and could be minimized by several monitoring and mitigation measures during the Project and upon closure.

For culturally valued vegetation, the loss of blueberry cover within the PDA of the Project was found to be a residual effect as Baffinland did not expect that blueberry cover would return to the pre-development state until after closure of the mine, and noted that some of the blueberry producing habitat would likely be permanently changed.

Baffinland indicated that the overall effects of the ERP construction, operation, and closure of the ERP could affect vegetation health, abundance and diversity, and culturally valued vegetation, though as noted in the FEIS Addendum, Volume 6, Section 3.2.4, overall effects on vegetation abundance and distribution were predicted to be not significant with a high level of confidence. Volume 6 of the FEIS Addendum also noted that project effects on vegetation health were expected to be limited, but that Baffinland's assessment confidence was moderate owing to uncertainties with respect to the effects of dust and other contaminants on local vegetation. Baffinland also noted that, although unlikely, the introduction of invasive vegetation species may pose a threat to the abundance and diversity of native plant species.

On the basis of the potential for these effects, the following monitoring and mitigation measures have been proposed to minimize the potential impacts of the ERP Proposal on vegetation abundance and diversity and culturally valued vegetation:

- Plan and conduct project activities to minimize the project footprint within the PDA;
- Project vehicles will stay on the established roads within the PDA during operation, limiting new disturbance to the PDA;
- Disturbed terrestrial habitat will not be reseeded during construction, operation and closure. Revegetation of the terrestrial habitat to be allowed to occur naturally in order to reduce the likelihood of invasive plant species becoming established within the RSA due to project development activities;
- Equipment brought to the Project site will be cleaned of soils that could contain plant seeds that do not naturally occur in the RSA; and,
- Dust Control Program.

Baffinland further noted its view that mitigation measures to reduce effects on vegetation health would be addressed by those measures used to mitigate effects on air quality as outlined in Volume 5 of its FEIS Addendum. During construction and closure phases of the ERP development, Baffinland's mitigation measures as based upon best management practices were outlined in Appendix 10 D-11 of the FEIS Addendum as follows:

- The use of coarse granular material for road construction;
- Watering roads, as necessary, to reduce visible plumes when it is practical to do so (e.g., when temperatures are above freezing);
- Using other dust suppressants as appropriate;
- Using well-defined haul routes to minimize disturbed surfaces;
- Limiting traffic to essential use over construction areas;
- Limiting speed over construction areas; and

- Minimizing drop distances (i.e., using adjustable stackers) for stockpiling activities.

During the operational phase of the ERP development, Baffinland's mitigation measures for vegetation health were outlined in Appendix 10 D-1 of its FEIS Addendum:

- Exhaust stacks for power generators will be clustered within one to two stack diameters of each other to enhance plume rise, thereby reducing ground-level concentration of air contaminants;
- Reducing drop distances to the stockpiles;
- Reduced speed where possible along roads;
- Dust suppression (water or other agent) on mine site roads and airstrips; and,
- Haulage trucks to be fitted with roll-on tarp covers to minimize dust.

Baffinland indicated that it had initiated monitoring of dust along the tote road in consultation with the Terrestrial Environment Working Group (TEWG) and that within the development areas of the mine and port, it would monitor air quality as required by the Mine Safety Act.

## **4.7.2 Views and Concerns of Interested Parties**

Environment Canada's (EC) final written submission issue, EC-2, recommended that the geographical extent of Project Certificate Condition 10 be expanded to include dust deposition from the Tote Road and requested that Baffinland clarify the inconsistency in deposition thresholds used. EC noted that it accepted that Baffinland had commenced monitoring along the Milne Inlet Tote Road and Baffinland's commitment to clarify the thresholds in its Dust Monitoring Plans, confirming that this issue was resolved.

The Hamlet of Pond Inlet's final written submission included concerns with the data presented by Baffinland related to dust modelling for the tote road and Milne Inlet Port, noting specifically that the Hamlet was not confident in the data presented related to the impacts of dust. The Hamlet requested clarification as to how Baffinland came to the conclusions presented within the FEIS Addendum, noting concern regarding the potential for direct impacts of dust to vegetation, and indirect impacts of dust to caribou and terrestrial wildlife. The Hamlet recommended that dust collection be undertaken within a closer vicinity to the road than Baffinland's proposed 15 metre setback. The Hamlet also recommended that Term and Condition 10 be amended to include additional areas of the road near the deposit, camp, and airstrip, as well as along the entire length of the tote road.

## **4.7.3 Views of the Board**

The Board finds the Proponent's proposed mitigation measures to minimize potential dust impacts from ERP components to be contradictory; the FEIS Addendum indicated that the only mitigation measure required to control dust would be equipping trucks with roll-on tarps. However, at the Public Hearing,



the Board notes that Baffinland indicated that it would utilize the application of dust suppressants where needed.<sup>87</sup> Within Appendix 10 D-22 of Baffinland's FEIS Addendum, the use of dust suppressant is listed as a corrective action for dustfall along the Milne Inlet Tote Road. The FEIS Addendum, however, does not provide an indication of the number of sampling locations nor frequency of dustfall sampling to be conducted along the Milne Inlet Tote Road.

The Board also notes the same inconsistency between Baffinland's Air Quality and Noise Abatement Management Plan (Appendix 10 D-22) which states that other than tarped ore haul trucks, no specific mitigation measures are provided for dust control and its Road Management Plan (Appendix 10 D-8) which states that during the summer months road dust might be problematic and that where and when appropriate, dust suppressants might be used. That same Plan (Appendix 10 D-8) goes on to state that during the summer months, water *will* be used to damp down the roads and control the dust (*emphasis added*).

The Board has some concern with the inconsistencies in the discussion pertaining to dust suppression along the Milne Inlet Tote Road. For this reason, the Board is of the view that dust monitoring near the mine site, Milne Port and along the length of the Milne Inlet Tote Road is of increased importance for the ERP and in order to verify impact predictions related to dustfall deposition and vegetation health, the Board recommends additional monitoring effort at these project locations.

The Board is of the opinion that the Proponent will need to update its Dust Management and Monitoring Plan to address the ERP activities, and provides the following items for consideration:

- a) Outline specific plans for monitoring dustfall along the entire length of the tote road and in the vicinity of other ERP components, including the spacing and placement of sample stations, and frequency of data collection throughout the entire year, noting that dust sampling shall be required in winter months to determine the amount and extent of dustfall.
- b) Identify the specific adaptive management measures to be considered should monitoring indicate that dust deposition from traffic on the Tote Road is greater than initially predicted.

#### **4.7.4 Conclusions and Recommendations of the Board**

Terms and conditions 31 through 40 of the existing Project Certificate address Vegetation.

The following existing terms and conditions require no changes but should be applied to the ERP: 31 through 40.

The Board has not identified any new terms or conditions that should be added to the Vegetation section.

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<sup>87</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 178, line 19.

## **4.8 Freshwater Aquatic Environment Including Biota and Habitat**

### **4.8.1 Views of the Proponent**

The Valued Ecosystem Components (VECs) identified for the freshwater environment, as listed in the Final Environmental Impact Statement (FEIS) Volume 2, Table 3-2.2, are freshwater quantity; freshwater and sediment quality; and fish, fish habitat and aquatic ecosystems. Baffinland indicated that its freshwater biota and habitat baseline studies provided a synthesis of information related to freshwater biota, including fish and lower trophic level communities, and aquatic habitat. It also noted that freshwater biota and aquatic habitat were characterized for Milne and Steensby Ports, the Mine Site area, the Milne Inlet Tote Road and the railway and access road areas.

Baffinland indicated in the FEIS Addendum that the Early Revenue Phase (ERP) activities would interact with surface water through several means, including by way of example:

- Water intakes for potable water in camps and shorter-term construction needs;
- Tote Road stream crossings and road maintenance;
- Sewage treatment and disposal at camps;
- Railway watercourse crossing and diversions;
- Railway construction road (construction and maintenance);
- Operations phase runoff from waste rock and ore stockpiles (subject of the Waste Rock & Ore Stockpile Management Plan);
- Potential surface water runoff from project areas at Milne Port, Mine Site and Steensby Port; and,
- General site runoff from land disturbances.

With respect to freshwater quantity, freshwater and sediment quality, and fish, fish habitat, and aquatic ecosystems, Baffinland indicated within Volume 7 of its FEIS Addendum that the ERP would have similar effects on this VEC as the Approved Project previously subject to assessment.

Baffinland noted that the ERP would result in changes to freshwater quantity due to changed rates of water withdrawal, water diversion, and discharges to freshwater, as a result of the following:

- Increased Mary River camp population during ERP operations combined with Mary River Project construction or operation, resulting in increased annual water takes from Camp Lake, and a corresponding increase in the volume of treated sewage discharged to Mary River.
- Milne Port camp to be used for a longer duration and possibly for the life of the Project. While volume of water withdrawal remain unchanged from what was assessed for Mary River, the duration of effects on freshwater quantity associated with use of this camp change from the construction phase only to life of the Project.

Baffinland noted that these changes to the effects assessment for freshwater quantity did not result in changes to the significance determinations and that all effects to this VEC were predicted to be not significant.

With regard to freshwater and sediment quality, Baffinland's FEIS Addendum noted that the ERP would result in changes to this VEC as a result of:

- Increased mine site camp population and increases to the volume of treated sewage discharged to Mary River; and
- Increased emissions to air resulting from a larger mine site camp facility and the loading of trucks and railway cars from a common ore stockpile at the Mine Site.

Baffinland indicated within Volume 7 of its FEIS Addendum that most of the ore dust generated at Milne Inlet would be deposited in the marine environment or would fall onto land that drains to the ocean, and that no fish-bearing streams would be affected. It noted that while effects on water and sediment quality from dust for the ERP would be beyond the effects assessed in the FEIS, the effects of ore dust on water and sediment quality in the freshwater environment were expected to be negligible.

Baffinland found that impacts to freshwater quality from the ERP Proposal would be not significant, and included consideration of the following:

- Ground preparation and earthworks;
- Laydown areas, camps, fuel storage and waste management;
- Water use and management;
- Treated sewage effluent discharges to Sheardown Lake and Mary River;
- Construction fugitive dust emissions; and
- Increased total suspended solids from dust deposition in various watercourses at the Mary River Mine Site during construction and operations phases.

Baffinland noted that in all cases, with effective implementation of mitigation, monitoring and adaptive management measures in place, all residual effects were predicted to be not significant.

With regard to the fish, fish habitat and aquatic ecosystems VEC, Volume 7 of Baffinland's FEIS Addendum noted that the ERP would result in changes to the specific key indicator Arctic char, as related to changes in the assessment of effects on water quantity, water and sediment quality, and aquatic habitat. These specific changes which could potentially affect freshwater biota and habitat include the following:

- Direct loss of habitat from project footprint and stream crossings at the Milne Inlet Port Site;
- Changes in water management/diversion at Milne Port;
- Increased water withdrawals to support increased camp capacities;
- Dust deposition at the Milne Port and along the Milne Inlet Tote Road;
- Changes to dust deposition at the Mine Site;

- Increased volume of discharge of treated sewage effluent at the Mine Site as a result of the ERP; and,
- Effects of increased sedimentation in Arctic char habitat and alterations to substrate and/or productive capacity (i.e., lower trophic level biota).

The water and sediment quality assessment presented within Volume 7 of Baffinland's FEIS Addendum indicated that the ERP would result in residual effects to fish and fish habitat from the introduction of dust to surface waters during construction and operation, but that waterbodies located within the dust deposition zone in the Milne Port study area were largely devoid of Arctic char.

Baffinland's FEIS Addendum concluded that there was little potential for non-point releases of materials which may alter freshwater quality to affect Arctic char in the Local Study Area (LSA) due to the limited distribution of this species in the development area and that the majority of infrastructure associated with the ERP would be located in watersheds that do not support Arctic char and in some cases, do not support fish. Volume 7 of its FEIS Addendum also indicated that Arctic char had not been captured in Phillips Creek and that it was therefore believed that the area either does not support char or provides marginal habitat. Baffinland further concluded that the release of materials via point sources in the Milne Port study area, including ore stockpile runoff and treated sewage effluent, would be directed to one particular stream which does not possess Arctic char habitat, or would be discharged via a pipe to Milne Inlet and that there would therefore be no effect on Arctic char health and condition in the LSA, and that the findings from its the FEIS assessment remained unchanged.

To prevent or mitigate the effects of the ERP on freshwater biota and habitat in the LSA and Regional Study Area (RSA), Baffinland presented a number of mitigation measures within the Surface Water and Aquatic Ecosystems Plan as submitted within the FEIS Addendum proposal. Baffinland noted that these were designed to reduce potential effects on water quality, freshwater fish, fish habitat, and other aquatic organisms and that further mitigation measures were detailed within the Wastewater Management Plan, Waste Management Plan and Emergency and Spill Response Plan. Examples of mitigation measures designed to mitigate impacts to freshwater biota and habitat include:

- Development of operating procedures to mitigate negative impacts caused by freshet events, including establishing/marketing locations of susceptible crossings, clearing of snow from roads, and excavation of areas downstream and upstream of crossings prior to the onset of freshet.
- Measures to protect fish habitat including the construction of ramps, installation of overflow culverts, for all works that require use of explosives in or near water bodies, following the "Guidelines for Use of Explosives In or Near Canadian Fisheries Water, 1998", for dock construction (dredging, piling, backfilling) use of silt curtain and/or bubble curtains, and the design of watercourse crossings to limit barriers to fish movement.

The Proponent has concluded that with the monitoring and mitigation measures as proposed, the ERP will not have significant adverse effects on aquatic ecosystems, freshwater fish and fish habitat, including arctic char.

## 4.8.2 Views and Concerns of Interested Parties

The Qikiqtani Inuit Association (QIA) indicated within its final written submission that the ERP Proposal has increased the level of uncertainty related to aquatic effects for all phases of the project and for the Mine Site, Tote Road and Milne Port. Further the QIA identified information gaps and methodological issues which contribute to heightened uncertainty, which it notes, created difficulties in assessing potential impacts and providing recommendations for robust monitoring and mitigation plans.

Specifically, the QIA's final written submission stated that where proposed year-round trucking activities have the potential to mobilize dust from the road and from the ore during loading, transport, and unloading, the impacts of this dust on freshwater ecosystems is uncertain. It indicated that better modeling would be required to predict dust fall effects and that more detailed monitoring would be required to establish real impacts and inform adaptive management. The QIA asserted that Baffinland had not adequately assessed the potential impacts on of dust mobilized by ERP activities on freshwater habitats and biota. It also indicated that the Proponent's modeling estimates and data presented raise uncertainties about the quantity, chemical composition, and transport of dust mobilized by the ERP activities.

The QIA noted that the sediment deposition threshold used by Baffinland to assess the significance of sediment effects on arctic char egg survival is not adequately supported by the studies cited, and that based on a review of other literature, Baffinland may have underestimated the magnitude of sediment impacts.

With respect to dust suppression, the QIA's final written submission noted a lack of clarity with respect to where or how much calcium chloride or other unspecified binding agents might be applied to roadways, whether differential application had been considered in dust dispersion modeling, or whether potential chemical impacts on receiving waters had been considered. The QIA noted that the impacts of dust dispersal were uncertain, and that they would be determined in large part by the quantity, quality, location and seasonality of dust deposition during the life of the Project. The QIA's final written submission, similar to that of the Hamlet of Pond Inlet, noted that Baffinland's assertion that the dust layer would not measurably affect the albedo of the ice seemed unlikely, and further indicated that dust in sufficient quantity could reduce biological productivity under the ice and advance the timing of spring melt. In addition, the QIA recommended that Baffinland's Dust Management and Monitoring Plan be updated to include a requirement for aquatic sedimentation monitoring at representative cross-sectional transects to assess deposition rates on both sides of the roadbed, around Milne Port, and around the mine site.

The QIA recommended that two new terms and conditions be added to the Mary River Project Certificate, regarding dust dispersion modelling and the Proponent's Aquatic Effects Monitoring Program.

Environment Canada's (EC) May 2013 technical comments noted that increased nutrient inputs could change the trophic status of Mary River, and recommended that Baffinland's monitoring of the receiving environment include productivity metrics such as chlorophyll a and nutrients. Baffinland's response to EC's May 2013 technical comments indicated that chlorophyll A and nutrients would be monitored as

part of its Aquatic Effects Monitoring Program. EC noted within its final written submission that it considered this item resolved.

Similarly, EC's May 2013 technical comments also requested that Baffinland clarify how contaminated water from its airstrip would be collected and treated and that it provide the discharge location and confirm that effluent would be characterized. Baffinland's response to this comment indicated that runoff would be directed to a collection area as outlined within its Mine Site Drainage Plan as approved by the Nunavut Water Board. EC indicated within its final written submission that this item had been resolved.

EC also noted within its final written submission that it was satisfied with the overall quality of the information provided and that while it accepted that appropriate methodology was employed to develop the conclusions presented in the FEIS Addendum, in some cases, monitoring would be required to support the conclusions presented, specifically indicating that additional detail in water management plans and refinement of spill modelling and spill response planning would be required.

The Hamlet of Pond Inlet indicated concern within its final written submission regarding the potential for carbon from the exhaust of transiting ships to collect on glaciers, noting specifically, a concern with respect to this soot contributing toward glacier melt and recession through the albedo effect. The Hamlet of Pond Inlet recommended a new term and condition to monitor carbon deposition onto, and melt rate of, glaciers along the shipping route. It also recommended that terms and conditions within the existing Mary River Project Certificate be amended, noting that condition 7 should include carbon from ship emissions along the northern shipping route, and that conditions 8 and 9 should be amended to also include Milne Port.

The Hamlet further noted concern with respect to Baffinland's modelling of dustfall, noting specifically a concern regarding the impacts of dust into creeks which could affect char spawning. The Hamlet requested that dustfall monitoring be undertaken closer in proximity to the tote road than Baffinland's proposed 15 metre setback, and recommended that term and condition 10 of the existing Mary River Project Certificate be amended to include monitoring at the camp, airstrip, and along the entire length of the tote road.

In addition, the Hamlet of Pond Inlet indicated that according to Inuit knowledge, increased dust on creek ice would speed up the rate of melt in the vicinity of Milne Port. The Hamlet of Pond Inlet noted its concern that Baffinland's modelling may not have considered the implications of 24 hour sunlight into its predictions on the potential for increased ice melt. The Hamlet of Pond Inlet recommended that all terms and conditions and requirements for dust monitoring be amended to include ice on Phillips Creek and other fish bearing freshwater bodies in the vicinity of Milne Port.

The Mittimatalik Hunters and Trappers Organization's (MHTO) final written submission recommended that Baffinland undertake a study in or near Milne Inlet which would monitor the health of the arctic char, and outlined the importance of consulting with the MHTO prior to commencing this work to determine the best times and locations to undertake such monitoring.

### **4.8.3 Views of the Board**

The Board notes that comments raised in the MHTO's final written submission regarding arctic char were provided in terms of the marine environment, and it also recognizes the MHTO's comment that providing food for families and communities is an integral part of the wellbeing and livelihood of Inuit and Nunavummiut. For this reason, the Board is of the opinion that further studies on arctic char are warranted not only within Milne Inlet and Eclipse Sound, but also within the freshwater streams, lakes and water bodies which are located within the vicinity of the project area and overall footprint.

The Board notes that the Baffinland did not provide conclusive evidence on the presence of arctic char in waterbodies near project activities within its FEIS Addendum, nor were conclusions made with high levels of certainty in this case. The Board agrees with the position of the Hamlet of Pond Inlet and finds that additional monitoring of arctic char fisheries in freshwater bodies within watersheds in proximity to the project development area is needed in order to properly account for potential impacts of the Mary River Project and the ERP activities. The Board feels that the concern raised by the Hamlet of Pond Inlet regarding potential impacts of the ERP to arctic char in fish-bearing streams in the area of the Mary River Mine and Milne Inlet warrant further study, including, but not limited to, Phillips Creek, Tugaat and Qurluktuk.

Furthermore, the Board agrees with the positions of the Hamlet of Pond Inlet and the QIA regarding the need for dustfall and aquatic sedimentation monitoring in proximity to the tote road water crossings to both obtain pre-trucking baseline information, as well as to monitor potential impacts of dustfall on water and sediment quality, fish and fish habitat, and the potential for this to contribute to increases in rates of ice melt.

The Board also notes concerns raised by the Hamlet of Pond Inlet with regard to the potential contribution of soot deposition from ship transits to increased glacial melt. While the Board has not provided specific a term and condition with respect to this matter, it recommends that Baffinland engage in dialogue with Environment Canada to determine if research or monitoring programs may be reasonably established to investigate these concerns further. The Proponent is also encouraged to communicate the results of these discussions with the community of Pond Inlet and if practicable, to discuss potential community-based monitoring strategies which may be pursued.

### **4.8.4 Conclusions and Recommendations of the Board**

Terms and conditions 41 through 48 of the existing Project Certificate address potential impacts to Freshwater Aquatic Environment including Biota and Habitat.

The following existing terms and conditions require no changes but should be applied to the ERP: 41 through 48.

The following new terms and conditions should be added to the Freshwater Aquatic Environment including Biota and Habitat section:

1. The Proponent shall develop plans to conduct additional surveys for the presence of arctic char in freshwater bodies and ongoing monitoring of arctic char health where applicable, within watersheds proximal to the mine, tote road and Milne Inlet Port project development areas, including but not limited to, Phillips Creek, Tugaat and Qurluktuk. The Proponent shall consult with the MHTO regarding the design, timing, and location of proposed surveys and ongoing monitoring.

The following existing terms and conditions from the Groundwater/Surface Water VEC apply to the preceding discussion and require minor revision and should be applied to the ERP: 21.

**Condition 21:** include amendments to the Proponent's Aquatic Effects Monitoring Program to include dustfall monitoring as follows:

- a) To establish a pre-trucking baseline and collect data during Project operation for comparison;
- a) To facilitate comparison with existing guidelines and potentially with thresholds to be established using studies of Arctic char egg survival and/or other studies recommended by the Marine Environment Working Group (MEWG); and,
- b) To assess the seasonal deposition (rates, quantities) and chemical composition of dust entering aquatic systems along representative distance transects at right angles to the Tote Road and radiating outward from Milne Port and the Mine Site.

## **4.9 Terrestrial Wildlife and Habitat**

### **4.9.1 Views of the Proponent**

Within its Final EIS Addendum, Volume 1, Baffinland indicated that terrestrial mammals found in the region include barren-ground caribou of the North Baffin herd, wolf, Arctic and red fox, ermine, Arctic hare, and lemmings. As caribou have such significance to Inuit culture and are an important component of the subsistence lifestyle of adjacent communities, caribou were chosen as the indicator species for this component of the assessment within the original FEIS for the Mary River project. Baffinland concedes that although wolves and foxes are the dominant carnivores in the area, very limited information was available and could be collected on these species because they were so rarely observed.

Baffinland noted that North Baffin caribou are present throughout the region at low densities and that their numbers seem to vary in accordance with a 60- to 70-year cycle. The last period of caribou abundance in the regional study area was 1980 to 2000, and the previous period of low abundance was the 1940s. While Baffinland indicated that caribou occur throughout the entire region, they are expected to remain at low numbers for the next couple of decades. While some populations of caribou migrate between preferred habitats in summer and winter, North Baffin caribou appear to be non-migratory and are likely to be found relatively equally in many locations throughout the Project area.



Updates to Baffinland's Final EIS Addendum for the Early Revenue Phase (ERP) Proposal focused on areas of potential direct and indirect effects of increased traffic on the Tote Road to terrestrial wildlife species. With specific regard to movement of caribou, Baffinland predicts that no significant adverse effect to caribou movement across the roadway will occur because of trucks creating a barrier to movement. If caribou numbers are to increase, as is predicted by Inuit Quajimaningit (IQ) and harvest data, Baffinland has indicated that monitoring of caribou movement across the roadway will be implemented.

Baffinland contends that if caribou mortality were to increase as a direct result of the Project, the effects could be readily mitigated by increasing traffic controls on the Tote Road. The timing and duration could only be determined by repeated on-site observations of caribou behaviour as the Project proceeds through construction and operation. All mortalities would be reported and carcasses promptly removed from the Railway to prevent possible collisions with scavengers.

Baffinland does not believe that the Project's transportation infrastructure will provide improved access to the Regional Study Area (RSA) and that hunter access and knowledge of the RSA are not expected to significantly change from baselines conditions. It is therefore the view of the Proponent that no specific mitigation measures are required.

Metals in soils and vegetation from aerial deposition potentially affecting caribou health was included within the assessment in the approved Project's FEIS, Appendix 6G-2. In summary, it noted that caribou exposure to metals in soil and vegetation was expected to be low due to the relatively small area outside the various project development areas where dust deposition was predicted to be high enough to have an affect on plant health. As a result, the likelihood of substantial increases in metals loading to caribou via foraging (and hence, to local people eating caribou), was predicted to be low.

Mitigation of dust effects on forage food was noted to be addressed by those measures used to mitigate effects on air quality as described in the FEIS for the approved Project, Volume 5, Section 2. Baffinland noted that potential effects of dustfall within the ERP Proposal development areas were not considered further since vegetation removal was predicted for the entire project development area and is encompassed within the expected area of caribou habitat loss.

According to Baffinland, the current low numbers of caribou in the RSA suggest that monitoring should focus on simple data at first and more intensive monitoring should be initiated only if certain indicators trigger further questions. The goal of the initial monitoring would therefore be to collect data that tests predictions, where possible, and to collect information that would trigger further monitoring if needed.

Baffinland has proposed to undertake collaring and aerial surveys, only based upon evidence that caribou abundance is increasing or that there is a significant need to acquire information to address real or perceived issues around caribou disturbance and avoidance of infrastructure. To monitor effects of the project on wildlife movement, Baffinland has proposed to have wildlife monitors hired through the Hunter and Trappers Organization (HTO) travel along the Tote Road twice per year to carry out surveys of caribou paths to determine if diversions around the road routing are occurring. A wildlife log would be established to keep a record of all sightings throughout the project development area, with all truck drivers and employees responsible to record sightings.

Caribou health was not assessed within the FEIS Addendum, however a follow up hunter harvest study led by the Government of Nunavut in partnership with the HTO has been proposed as a means of establishing baseline conditions of caribou health at a pre-development stage, and to monitor caribou health throughout Project development.

#### **4.9.2 Views and Concerns of Interested Parties**

The GN identified three main issues regarding caribou concerns associated with the ERP Proposal. The first issue raised by the GN was Baffinland's lack of monitoring programs for caribou at the population level, and its unwillingness to commit to participating in agency population monitoring programs. This, the GN noted, is exacerbated by the lack of a NIRB requirement for population level monitoring and mitigation measures for caribou.

*What is missing from the certificate conditions, in order for this development to occur without adversely impacting the north Baffin caribou population, is a requirement that the proponent accept responsibility for a portion of the additional population monitoring that will be required because of the increased risk of the Mary River project and this revenue -- this early revenue phase proposal due to the persistence and productivity of impacted wildlife.<sup>88</sup>*

The GN further recommended that the NIRB include a term and condition which directs the Terrestrial Environment Working Group (TEWG) to develop a comprehensive and collaborative monitoring program for caribou in the North Baffin region. Specifically, the GN requested that the following collaboration programs be identified as mandatory if the Proponent cannot demonstrate complete mitigation of all project impacts on the North Baffin caribou population:

1. Caribou Harvest Program;
2. Caribou Enumeration and Distribution Survey;
3. Caribou Movements Telemetry Study;
4. Study of the Social, Economic, and Harvest Impacts of the Milne Inlet to Steensby Inlet Infrastructure Complex; and
5. Caribou Habitat Monitoring Using Exclosures.

The GN's second issue concerned the effectiveness of the visual decision tree model to mitigate impacts to caribou from use of the tote road and all other transportation corridors during hours of darkness or night when the visual cues required to initiate mitigation measures may be reduced or unavailable. During the Public Hearing, the GN recommended that, given that the trucks would be operating on the tote road during periods of low visibility, alternative mitigation measures should be employed. Although the GN expressed its preference that every effort be made to avoid caribou mortality, it was also

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<sup>88</sup> P. Hale, Government of Nunavut, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, p. 391, lines 16-23.

suggested that there be a clear acceptance of corporate responsibility for the mortalities that could occur, with compensation to affected communities linked to the significance of the mortality to the overall caribou population:

*Should the caribou numbers increase in the future -- and this is what Inuit knowledge tells us -- this objective could be relaxed, but the company should still be responsible for these mortalities and compensate communities in some manner<sup>89</sup>.*

The third issue raised by the GN involved the increased access and increased harvesting which it suggested would result from project infrastructure as well as Baffinland's hunting policies. The GN-DOE noted its support for harvest activities and acknowledged the requirement to respect Inuit hunting rights under the NLCA. The GN indicated however, that increased harvesting would be an ERP and Mary River Project impact and that the Proponent should be required to participate in caribou harvest monitoring by supporting the GN-DOE agency harvest programs. The GN further requested a condition to support increased consultation and enforcement activities that may be required if quota or non-quota harvest restrictions become necessary.

The current health of the North Baffin caribou population also warranted discussion during the Public Hearing, with the GN providing an update on potential future harvesting restrictions being considered by Baffin Island communities:

*At that time, there was a very strong message from the participants, that the HTOs wanted the opportunity to assert their authority under the Land Claim to invoke bylaws to restrict the harvest in a manner that they considered necessary, given the state of caribou. And by that, I mean such things that were enacted by their elders when the caribou were last at very low numbers, such things as the community saying that a certain area was off limits to hunting.<sup>90</sup>*

Within its final written submission the GN countered the Proponent's claims that project infrastructure would not increase access and associated harvesting pressures from adjacent communities, stating that increased harvesting would be an impact of the Mary River Project and that as such, the Proponent should be required to participate in caribou harvest monitoring by supporting the GN-DOE agency harvest programs.<sup>91</sup> The GN noted that the mine site would essentially be a community constructed in the caribou calving area for North Baffin, and that the cumulative effects of the tote road and railroad will would the North Baffin on a north-south axis. Taken together, it was the GN's position that these cumulative effects would greatly increase harvest by increasing accessibility for hunters from adjacent communities as well as from the mine itself. According to the GN, the proposed infrastructure could impact survival and recruitment of North Baffin caribou through disturbance in the calving area and by

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<sup>89</sup> P. Hale, Government of Nunavut, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, p. 393, lines 1-5.

<sup>90</sup> P. Hale, Government of Nunavut, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, p. 400, lines 8-16.

<sup>91</sup> Government of Nunavut, Final Written Submission, January 13, 2014.

restricting or modifying seasonal movements of caribou from calving and post-calving areas to summer grazing areas.

Following a presentation by Baffinland on the first day of the Public Hearing, the GN requested clarification from the Proponent regarding the significance of the road on recovery of the North Baffin caribou population, prompting a response from Baffinland which countered the GN's claim that the Tote Road would increase harvesting by local communities.

*MR. HALE: Thank you, Madam Chair. I have a question for Mike Settingington. First of all, I would like to thank you for your presentation. I found it very clear, and it explained a lot of points. We understand that the road will afford easier access for caribou hunting, and under the agreement, obviously, beneficiaries are allowed to hunt caribou. So in – in coming to your conclusion as to the significance of the road on caribou and the recovery of the caribou to larger numbers, did you take that into account?<sup>92</sup>*

*MR. SETTERINGTON: Mike Settingington for Baffinland. This question goes back to the approved project, as well, and the access afforded by the road, and our stand has been that the road is a public road and pre-exists the project. There are improvements being made to the road that does not change hunter access to that area. Much of the access also includes winter access to the area. Was harvest addressed and considered in the recovery of a population? I think that's best addressed in our updated energetics model and the background behind that model is that model has been 20 or 25 years in development from the caribou expert that we had help us develop it, and the application for Baffinland, in particular. And that is where we looked at population projections through to 2015, and we looked at scenarios with and without harvest. And it showed that regardless of whether harvest exists or harvest does not exist, the project has a marginal effect on the population projections. So, yes, it was considered.<sup>93</sup>*

In response to a question from the Nunavut impact Review Board staff, the GN was unable to provide evidence to support its position that project infrastructure was currently or could be expected to be used for the purpose of harvesting by adjacent communities:

*We don't have statistics on usage of the road at this time, so I -- I really can't provide evidence that there is increased use of it by harvesters, nor can I indicate whether it is seasonal. I would anticipate it is, because this time of year, it's pretty cold to go any great distance. You asked whether it was specific to employees of the worksite or if it was more the residents of neighbouring communities, and,*

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<sup>92</sup> P. Hale, Government of Nunavut, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 211, lines 14-23

<sup>93</sup> M. Settingington, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, pp. 211-212, lines 24-26 and lines 1-17.

*again, because there's no statistics on usage maintained by any organization, we don't have information in that regard.<sup>94</sup>*

Evidence from the MHTO also appeared to counter the GN's position of project infrastructure increasing harvesting access by adjacent communities, noting instead that project infrastructure was expected to present an obstacle or impediment to access:

*Mittimatalik Hunters and Trappers Organization is aware that hunters will need to use other hunting grounds in the area of the mining project and have started to go around the tote road to reach the hunting grounds.<sup>95</sup>*

The MHTO indicated that the ERP would greatly impact the habitat of the wildlife residents of Pond Inlet residents rely upon, and that therefore, the MHTO provided a critical perspective when considering the ecosystemic and socio-economic impacts of this project. The MHTO noted its desire to be informed, educated and engaged on this project, and acknowledged that technical and financial support is desperately needed for this. Within its submission to the NIRB the MHTO focused on hunting rights for its members and for Inuit employees of Baffinland, calling for increased involvement of the MHTO on issues related to wildlife and habitat rights, management and monitoring. Specific requests for compensation and concerns about research were also raised, while specific terms and conditions which the MHTO believes require inclusion or amendment were presented.

The MHTO strongly recommended that it be included in the design, delivery and evaluation of monitoring plans as they relate to land, air, and water, for the mine, ports and transportation routes, in determining the impact to terrestrial and marine animals and their habitat. Specifically, the MHTO requested that Project Certificate terms and conditions 99-c, 110 & 112 be amended to include a requirement for the MHTO to be involved during the design and implementation of these programs.

The QIA indicated that it found the information within the FEIS Addendum regarding the effect of the ERP on wildlife to be sparse, with predicted impacts difficult to evaluate. This in turn resulted in key pieces of information being very limited in detail and as such, the QIA focused on recommending mitigation measures and monitoring efforts to account for the uncertainty in the impact predictions.

Within its final written submission to the NIRB the QIA recommended the inclusion of four new terms and conditions into the Project Certificate directly associated with mitigation of potential effects to terrestrial wildlife:

1. B1-1 The Proponent shall revise the mitigation, monitoring and management plans (especially the TEMMP) to include enhanced designs for monitoring and mitigation for the increased traffic along the Tote Road on caribou movement. Specifically, the caribou monitoring should include

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<sup>94</sup> P. Hale, Government of Nunavut, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, pp. 401-402, lines 25-26 and lines 1-10.

<sup>95</sup> J. Pitseolak, Mittimatalik Hunters and Trappers Organization, NIRB Public Hearing File No.: 08MN053 Transcript, January 29, 2014, p. 571, lines 6-10.

a requirement for surveys (ground-based snow track monitoring, camera monitoring or direct observations) to be conducted at least weekly.

2. B1-2: Snow bank levels along the edges of roadways shall be determined in conjunction with monitoring and the Terrestrial Environment Working Group (TEWG), with specific attention given to developing height restrictions.
3. B1-3: The Proponent shall identify proposed crossing areas along the Tote Road. Details regarding each crossing (such as embankment height, road width, etc.) shall be provided to the TEWG. The information regarding each crossing must be sufficient to assess the effectiveness of the ability of caribou to cross the road.
4. B2-1: The Proponent shall revise the mitigation, monitoring and management plans (particularly the TEMMP) to include enhanced designs for monitoring and mitigation of potential impacts of the increased traffic along the Tote Road on calving caribou. The TEMMP shall be revised to include project specific application of Caribou Protection Measures taking Appendix I of the NBRLUP into consideration.

The QIA found that the Proponent's assumptions regarding the ability of caribou to cross the tote road during operations were lacking sufficient justification, noting that the Project's size and scale demand that a precautionary approach be taken. Specifically, the QIA felt that problematic assumptions were made regarding the acceptability of road traffic for crossing caribou. The lack of detail regarding caribou crossings along the road was felt to have further exacerbated this issue. In addition, the methods of mitigation, and the level of caribou mortality that would trigger mitigation measures were found by the QIA to not be fully defined.

The QIA also noted its concern regarding snowbanks along the tote road acting as a barrier to caribou movement. During the Public Hearing Baffinland explained that snowbanks along the road are managed to reduce the chance of snow drifting, which means that they are kept at a low enough that caribou would be able to cross the road. The QIA recommended that the NIRB consider modifying QIA's suggested condition B1-2 in light of Baffinland's comments specific to snowbank height along the tote road.

The QIA expressed its position that ensuring implementation of the Caribou Protection Measures as set out within the North Baffin Regional Land Use Plan would require modification to accommodate project specific application. Thus, the QIA proposed Caribou Protection Measures that it suggested would minimize the predicted effects on North Baffin caribou habitat, movement, mortality, and health.

*QIA is encouraged to note that Baffinland has recognized that adjustments to monitoring frequency is a subject that requires more attention. QIA therefore encourages NIRB to consider modifying QIA's suggested condition B1-1 in light of Baffinland's comments yesterday. Modifications should therefore highlight that*

*potential mitigation measures and the need to assess monitoring frequency be discussed through the terrestrial environment working group.<sup>96</sup>*

The issue of project employees being permitted to harvest in project areas during leisure hours and further assisted with harvesting activities was also discussed during the Public Hearing by the MHTO and members of the public, with differing views presented.

*If that were to be -- if the policy of -- the no-hunting policy by Baffinland were to be amended due to safety purposes, because of the fact that they were 12-hour shifts. We strived very hard and continue to strive hard that the mine employees be able to harvest caribou, but if safety is going to be an issue, at least they take one or two days off. And they will get prior approval, and, that way, they can go harvesting. But Baffinland Iron Mines -- like, if their employees are allowed to go harvesting and we want them to be provided hunting equipment, snowmobiles, Coleman stoves, and the like, and they probably can establish a storage shed to store hunting equipment if they were to change their policy.<sup>97</sup>*

*The ability to be allowed to hunt, employees should only be allowed to hunt if they'll be returning home from their two-week term. If he were to hunt too early during his term there, the food will spoil, but I would appreciate it if they could go hunting if their term is nearly up and they're ready to go home.<sup>98</sup>*

In its final written submission to the Board and again at the Public Hearing, the QIA requested that the NIRB reconsider Project Certificate terms and conditions 62 and 124 in light of Article 11.10 of the IIBA.

*QIA understands that certain parties have also raised real and valid concerns relating to population level impacts that could arise based on employees harvesting during leisure hours. QIA believes, again, these topics can be addressed through the development of reasonable procedures. QIA recognizes these discussions should take place on a species-specific basis and may actually include species-specific prohibitions.<sup>99</sup>*

With respect to wildlife compensation, the QIA provided additional information during the Public Hearing regarding the fund established by the IIBA to address potential claims:

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<sup>96</sup> S. Williamson-Bathory, the Qikiqtani Inuit Association, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, p. 347, lines 13-21.

<sup>97</sup> A. Killiktee, Mittimatalik Hunters and Trappers Organization, NIRB Public Hearing File No.: 08MN053 Transcript, January 30, 2014, pp. 951-952, lines 14-26 and lines 1.

<sup>98</sup> T. Tatatuapik, Community Representative, Arctic Bay, NIRB Public Hearing File No.: 08MN053 Transcript, January 30, 2014, p. 953, lines 20-26.

<sup>99</sup> S. Williamson-Bathory, the Qikiqtani Inuit Association, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, pp. 361-362, lines 22-26 and lines 1-4.

*We heard comments raised by the HTO specific to caribou strikes, the potential for impacts to harvesting. Baffinland spoke briefly. I would like to confirm there is an entire article, Article 17, on wildlife compensation, a fund of a value -- initial value of \$750,000 is going to be established for QIA to administer claims of wildlife compensation. QIA will work on the policies and procedures of application and review, and those will be worked on with the communities and explained to the communities.<sup>100</sup>*

### **4.9.3 Views of the Board**

Throughout the course of its assessment the Board heard concerns from parties regarding the direct and indirect effects of the proposed traffic along the Milne Inlet Tote Road on terrestrial wildlife, particularly caribou. Traffic would operate continuously, 24 hours a day and year round, to the extent that weather and conditions allow. The Board feels that minor revisions to terms and conditions 53 and 54 of the existing Project Certificate will allow for these concerns to be adequately addressed through collaboration with the Terrestrial Environment Working Group. The Board expects that the Proponent will revise its mitigation, monitoring and management plans (particularly the Terrestrial Environment Management and Monitoring Plan) to include enhanced designs for monitoring and potential mitigation of increased traffic and potential impacts of the tote road on calving caribou, with project specific application of Caribou Protection Measures taken into consideration.

The Board recognizes that the ERP will add to the levels of helicopters and other aircraft operating in project areas, which has the potential to cause disturbances to terrestrial wildlife and wildlife harvesting, for example through the disruption of the feeding and migration of caribou wildlife. During the public hearing for the ERP the Board heard concerns from the public regarding wildlife being chased away by helicopters;<sup>101</sup> the NIRB supports these concerns and believes great care must be taken to ensure terrestrial wildlife and Inuit harvesting are not disturbed by project operations. It will be important for Baffinland to instill a culture of respect for wildlife and wildlife harvesting amongst all of its employees and subcontractors, including helicopter pilots and crew operating in and around project areas who might have a greater chance of encountering wildlife through daily operations. The Board notes that existing Project Certificate terms and conditions 59 and 71 address potential aircraft disturbances to wildlife, and the Board has included additional specific wording in condition 59 to guide the Proponent and the Terrestrial Environment Working Group in implementing appropriate mitigation measures to address these concerns moving forward.

While concerns were raised by the GN regarding the potential for project infrastructure to increase harvesting in project areas, the Board notes that a prohibition on harvesting in project areas by employees remains, while the Milne Inlet Tote Road has been in place for many years and evidence

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<sup>100</sup> S. Williamson-Bathory, the Qikiqtani Inuit Association, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, pp. 356-357, lines 21-26 and lines 1-4.

<sup>101</sup> C. Sangoya, NIRB Public Hearing File No.: 08MN053 Transcript, January 30, 2014, p. 780-781, lines 17-27 and lines 1- 9.



from the MHTO suggests that project infrastructure is more likely to serve as an impediment to community-led harvesting.

The Board notes that the current health of the North Baffin caribou herd may not be well understood by all parties, and supports a precautionary approach to the potential impacts from traffic which may affect the health and longevity of individual animals or the entire herd. The Board supports the view that Baffinland's monitoring efforts should be supportive of regional studies of population health and harvest programs for North Baffin caribou, and revisions to existing Project Certificate term and condition 51 are being recommended to address this. At the same time, the NIRB is hesitant to prescribe mandatory participation in government-led initiatives, particularly where financial contributions may be required and no discussion of anticipated amounts, frequency or duration has been supplied. The Board feels that the Proponent has demonstrated its willingness to address the GN's desire for coordination and support with government monitoring initiatives through existing commitments.

The Board agrees with the GN's position regarding the need for mitigation measures which ensure minimal disturbance to caribou, including the potential for the road and any of its ancillary aspects (i.e. snow banks) to act as barriers to caribou movement. The Board also agrees with the recommendations put forward by the QIA to address increased monitoring requirements, and has revised a number of existing Project Certificate terms and conditions accordingly.

#### **4.9.4 Conclusions and Recommendations of the Board**

Terms and conditions 49 through 64 of the existing Project Certificate address potential impacts to Terrestrial Wildlife and Habitat.

The following existing terms and conditions require no changes but should be applied to the ERP: 49, 50, 52, 55-57, 60-64.

The following existing terms and conditions require minor revision and should be applied to the ERP: 51, 53, 54, 58 and 59.

**Condition 51:** revised to highlight the need for Baffinland to coordinate with/support regional monitoring initiatives for North Baffin caribou which will address areas of uncertainty for Project impact predictions.

**Condition 53:** revised to clarify the expectation for Baffinland to develop specific mitigation measures in collaboration with the Terrestrial Environment Working Group, with clarification provided to ensure application to the Milne Inlet Tote Road during all seasons.

**Condition 54:** revised to clarify the expectation for Baffinland to develop specific mitigation measures in collaboration with the Terrestrial Environment Working Group, with clarification provided to ensure application to the railway and Milne Inlet Tote Road.

**Condition 58:** revised to clarify expectations associated with reporting on potential effects of the railway, road traffic, air traffic, and dustfall.

**Condition 59:** revised to include a requirement for Baffinland to develop a program or specific measures, in collaboration with the Terrestrial Environment Working Group, to ensure that employees and subcontractors providing aircraft services to the Project are respectful of wildlife and Inuit harvesting that may occur in and around project areas.

There are no new terms and conditions to be added to the Terrestrial Wildlife and Habitat section.

## **4.10 Birds**

### **4.10.1 Views of the Proponent**

Baffinland noted within its Final Environmental Impact Statement (FEIS) Addendum that it had undertaken additional baseline surveys for shorebirds, raptors and song birds within the Regional Study Area (RSA) in 2012. Based on the baseline information and impact assessment, Baffinland's FEIS Addendum concluded that the Early Revenue Phase (ERP) would result in no change to the environmental assessment for birds as conducted for the approved Mary River Project, but predicted a minor increase in residual negative effects due to increased activity at Milne Port and along the Milne Inlet Tote Road. The specific changes included direct habitat loss within the Project footprint and indirect loss due to sensory disturbance adjacent to the footprint, increased mortality risk due to collisions with Project infrastructure and vehicles or increased hunter access, and decreased health resulting from contamination of the surrounding environment. The Proponent assessed a number of key indicators of the bird Valued Ecosystem Component (VEC) which included peregrine falcon, snow goose, eider, and red-throated loon. The overall effects of the Project were deemed to not likely have serious implications for any species' regional populations.

The FEIS Addendum noted that Project-related activities could potentially alter bird behavior and cause displacement during all phases but that this displacement would be confined to the Project footprint.

While Baffinland's FEIS Addendum noted with confidence that Project effects would not have a significant impact on other bird species, the Proponent acknowledged weaknesses present in the baseline, particularly regarding issues beyond the scope of what it was capable of assessing through baseline surveys. As a result, and at the request of government regulators, follow-up monitoring has been proposed to include Gyrfalcon, seabird migration and overwintering, and songbird and shorebird diversity monitoring.

A number of mitigation measures have been designed to limit the Project effects on bird species, including:

- Minimizing the project footprint to the extent possible;

- Implementing no-hunting policies for Project employees;
- Ensuring orientation of project personnel includes best practices with regard to waste management and avoiding wildlife;
- Avoidance of large concentrations of foraging or molting birds to the extent possible;
- Conducting nest searches for all birds in areas to be disturbed during the nesting season, prior to any clearing of land;
- Implementing a nest management plan for nest sites within 750 metres of Project activity;
- To the extent possible, implementing flight altitude restrictions over known nesting areas and National Parks, and developing appropriate aircraft approach and departure flight paths to reduce the likelihood of bird strikes;
- Ensuring that any temporary communication towers using guy wires will be fitted with bird diverters to help minimize the risk of bird collisions;
- Routing ships to maximize distances between ships and shorelines, and to remain at least 2 kilometres from seabird colonies, and, to the extent possible, avoid Key Marine Habitat Sites;
- Handling ship discharges and oil spill emergency response plans to conform with relevant legislative requirements; and
- Minimizing dust dispersal through dust suppression.

Furthermore, additional measures specific to Baffinland's nest management program, cliff-nesting raptor mitigation, and Species at Risk mitigation were provided.

Baffinland's FEIS Addendum also included measures within many management plans that were proposed to contribute to the protection of bird species and habitats within the Project Area including:

- Air Quality and Noise Abatement Management Plan;
- Surface Water, Aquatic Ecosystems, Fish and Fish Habitat Management Plan;
- Waste Management Plan;
- Emergency Response and Spill Contingency Plan; and
- Oil Pollution Emergencies Plans for Milne Port and Steensby Port.

## **4.10.2 Views and Concerns of Interested Parties**

The Qikiqtani Inuit Association (QIA) noted within its final written submission that where oil spills have the potential to endanger large numbers of seabirds (specifically murres) or to pollute feeding areas, additional information would be required on the seasonal movements of these birds in relation to the proposed shipping in order to improve impact prediction. The QIA recommended that the Marine

Environment Working Group (MEWG) consider tagging studies to assess shipping interactions with juvenile murres and possibly other species.

The QIA, Environment Canada (EC), and the Hamlet of Pond Inlet all recommended that to limit impacts to various VECs including seabirds and ducks, Baffinland limit the number of ships transiting to and from Milne Inlet annually. While Baffinland disagreed with this recommendation based upon its stated need for operational flexibility, EC reiterated its position during the Hearing, noting:

*Environment Canada understands that operational flexibility is necessary, but EC is of the opinion that there must be a limit to that flexibility to ensure that monitoring programs and adaptive management are appropriate.*<sup>102</sup>

EC noted within its final written submission that as dust can have impacts on both migratory birds through their food and through water quality issues, it would be important to understand the amount of dust that may be deposited along the tote road as a result of the increase in traffic from the ERP. EC further noted that Baffinland's response to a previous comment regarding clarification of dust monitoring was adequate and that it felt that this issue had been resolved.

EC also noted within its final written submission that information gathered by shipboard observers would assist to inform its understanding of the migratory birds that nest, forage and migrate along the proposed shipping route and that it would help to inform mitigation and adaptive management decisions. EC specifically recommended amendment to terms and conditions 106, 107 and 108 pertaining to shipboard observers within the Mary River Project Certificate in its May 2013 technical comments, and encouraged the Nunavut Impact Review Board (NIRB) to provide clear direction in the Project Certificate to ensure that any determinations regarding seabird monitoring protocols along the northern shipping route occur through discussions with the MEWG.

Similarly to the QIA's recommendation, EC's final written submission reiterated its position that more research and monitoring would be required to validate Baffinland's predictions regarding migratory birds and to ensure effective adaptive management, and noted its appreciation that Baffinland had committed to collaborating with EC to address these concerns.

Community representatives also noted the importance of including birds in the Proponent's mitigation planning:

*I think that shorebirds and sea birds should be included in the mitigative measures plan, should there be a spill out in the ocean and in the inlet.*<sup>103</sup>

Parks Canada (PC) noted within its final written submission that the ERP local and regional study areas encompass a number of seabird colonies as well as important feeding and staging areas for a variety of

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<sup>102</sup> M. Dahl, Environment Canada, NIRB Public Hearing File No.: 08MN053 Transcript, January 30, 2014, p. 835, lines 10-14.

<sup>103</sup> T. Tatuapik, Community Representative, Arctic Bay, NIRB Public Hearing File No.: 08MN053 Transcript, January 30, 2014, p. 801, lines 17-21.

seabirds and seaducks, and further indicated that several of these seabird colonies are located within Sirmilik National Park or in the associated Bylot Island Migratory Bird Sanctuary. EC also noted that several sites in the area are known to have large offshore aggregations of seabirds, including the endangered Ivory Gull, and that some of these are nationally and internationally recognized as 'Important Bird Areas' and 'International Biological Programme Sites'. PC indicated within its final written submission that the management of seabirds was an area of shared interest with EC and that it therefore supported EC's technical analyses, comments, concerns, and conclusions, specifically noting its support for EC's recommended modifications to terms and conditions 106, 107 and 108 of the Mary River Project Certificate.

### 4.10.3 Views of the Board

The Board agrees with the positions of the QIA, EC, and PC as well as members of the public who noted the importance of birds to the assessment of the ERP activities and to ongoing monitoring, data collection, and assessment against impact predictions.

The NIRB agrees with the proposed rewording of Conditions 106, 107, and 108 to include the northern shipping route and to provide direction regarding the frequency of employing marine monitors, and to also require that marine mammal monitors also record the presence of marine birds. The Board also agrees that discussions determining seabird monitoring protocols along the northern shipping route should occur through the MEWG.

### 4.10.4 Conclusions and Recommendations of the Board

Terms and conditions 65 through 75 of the existing Project Certificate address potential impacts to Birds.

The following existing terms and conditions require no changes but should be applied to the ERP: 65 through 75.

While existing terms and conditions 106, 107, and 108 appear in the Project Certificate section relating to the Marine Wildlife and Marine Habitat, the Board recommends slight modifications as follows to address the concerns set out in the preceding section:

**Condition 107:** amended to apply this condition to the northern shipping route and to seabirds and seaducks as appropriate to determine the presence of such species.

**Condition 108:** amended to also apply to the northern shipping route and to seabirds and seaducks as appropriate to analyze impacts to bird species from the ERP activities.

*Note: Condition 106 has been revised to reflect the preceding section; however additional revisions were proposed and have been included in the Marine Wildlife and Marine Habitat, Section 4.12.4.*

The Board has not identified any new terms or conditions that should be added to this section.

## 4.11 Marine Environment, Marine Water/Ice and Sediment Quality

### 4.11.1 Views of the Proponent

As presented in Volume 8 of the Final Environmental Impact Statement Addendum, Baffinland's assessment of the potential effects on the Marine Environment specifically associated with the Early Revenue Phase Proposal focused on:

- Marine Water and Sediment Quality with respect to changes in dust deposition during operations (addressed primarily by the Board under Section 4.2 Air Quality of this Report);
- Marine Habitat and Biota with respect to Ore Dock Construction and Operation; and
- Marine Mammals with respect to Ore Dock Construction and seasonal open-water shipping during operations (also addressed under Section 4.12 Marine Wildlife and Marine Habitat of this Report).<sup>104</sup>

In addition, ballast water discharge from ore carriers into Milne Inlet was also added to the assessment.

#### Potential Impacts of Ballast Water Discharge into Milne Inlet

As part of the FEIS Addendum, Baffinland conducted a specific risk assessment to assess the risk of introducing aquatic non-native species during ballast water discharge at Milne Port.<sup>105</sup> The conclusion of this risk assessment indicated that, based on the assumption that there would be mid-ocean exchange of ballast water (the current regulatory requirement in Canadian waters) and assuming the discharges will be confined to a ninety-day period from mid-July to mid-October each year, the risk of introduction of non-native species at Milne Port from ballast water discharge would be at the lower ranking.<sup>106</sup>

A central basis for this conclusion was that ballast water carried from the mid-ocean can be expected to differ in temperature and salinity from water in Milne Port, with the benefit that this difference will reduce the likelihood of species introduction. It should, however, be noted that the level of uncertainty associated with this prediction was stated to be high because there is only very limited experience with shipping and associated ballast water discharges from Milne Port specifically, and into the arctic waters in this region generally.

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<sup>104</sup> FEIS Addendum, Volume 8, Item 1.5 Valued Ecosystem Components at p. 3.

<sup>105</sup> FEIS Addendum, Appendix 8B-4, Risk Assessments Ballast Water and Hull Biofouling.

<sup>106</sup> FEIS Addendum, Appendix 8B-4, Risk Assessments Ballast Water and Hull Biofouling, at p. 12.

In addition, in the ballast water dispersion modelling conducted by Baffinland for the FEIS Addendum it was stated that Milne Inlet water is dominated by the energy from fresh water inputs, and ballast water introductions will account for less than 0.007 % of the natural changes in water properties that occur.<sup>107</sup> Accordingly, Baffinland's dispersion modelling analysis also indicated that there would be no significant effects associated with the discharge of ballast water required to support the shipping of ore via Milne Inlet.

### *Ship Wakes, Erosion and Effects on Shorelines*

With the assumption that ore carriers traversing the route from Milne Inlet via Eclipse Sound to Milne Port will be generally at least 5 kilometres away from the shore until the final approach to Milne Port and recognizing that ore carriers will be travelling slower than 14 knots when travelling in Milne Inlet, Baffinland concluded that in "...most areas of the route, the natural wave regime results in the same or greater energy reaching the coastline during storm events than would result from ship-generated waves."<sup>108</sup> Baffinland concluded that "...it is considered highly unlikely that ships' wakes will cause any measureable change to coastal erosion or consequently to water and sediment quality beyond that occurs naturally."<sup>109</sup>

### *Shipping Route*

The proposed shipping route for the ERP Proposal follows an established shipping route via Baffin Bay, through Eclipse, by Pond Inlet and into Milne Inlet. This is the same shipping route that Baffinland has had approval to use since 2004 for resupply and shipping of iron ore during the 2008 bulk sample program. The community resupply ships also use this same shipping route.<sup>110</sup>

In response to intervenor comments regarding the possibility for shipping route changes, at the Public Hearing Baffinland agreed to discuss potential shipping route variations to avoid sensitive areas identified by such organizations as the Hamlet of Pond Inlet and the Mittimatalik Hunter and Trappers Organization (MHTO), where adjustments to the shipping route can be made while maintaining navigational safety.<sup>111</sup> Baffinland also outlined the rationale behind the selection of the ERP shipping route as multiyear ice comes down from Pond Inlet and often becomes lodged in Navy Board Inlet. For this reason, Baffinland selected the wider shipping route through Eclipse Sound to avoid icebergs and

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<sup>107</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 79, lines 2-22 and FEIS Addendum, Appendix 8-B Ballast Water Dispersion at Milne Inlet.

<sup>108</sup> FEIS Addendum, Volume 8, Section 3.4 Subjects of Note, Potential Effects of Vessel Wakes on Water and Sediment Quality, at p. 15.

<sup>109</sup> FEIS Addendum, Volume 8, Section 3.4 Subjects of Note, Potential Effects of Vessel Wakes on Water and Sediment Quality, at p. 15

<sup>110</sup> E. Madsen, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, pp. 42-43, lines 19-26 and lines 1-10.

<sup>111</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, pp. 128-129, lines 23-26 and lines 1-9.

the fact that the ice clears up sooner in Eclipse Sound, providing Baffinland with a longer open-water shipping season.<sup>112</sup>

#### Potential Fuel Spills along the Shipping Route

At the Public Hearing for the ERP Proposal Baffinland affirmed that it must be prepared to respond to a major spill along the northern shipping route and is now an associate member of Oil Spill Response Limited, an international response organization, which has the experience and capacity to assist Baffinland in dealing with major spills at sea.<sup>113</sup> As previously agreed upon at the Technical Meeting for the ERP Proposal held in Iqaluit in November 2013, Baffinland has confirmed it will complete additional modelling in association with Environment Canada to select the areas for spill modelling.<sup>114</sup>

#### Overwintering of Fuel Vessels in Milne Inlet

In Exhibit 55 filed by Baffinland at the Public Hearing, Baffinland noted, in the discussion of terms and conditions 93-96, that: “while over-wintering fuel vessels is not currently planned as part of the ERP Baffinland would like to preserve the flexibility to do so as needed as this activity is regulated by Transport Canada.”<sup>115</sup>

## **4.11.2 Views and Concerns of Interested Parties**

#### Potential Impacts of Ballast Water Discharge into Milne Inlet

In Fisheries and Ocean’s Canada’s (DFO) final written submission to the Board, DFO emphasized the potential for ballast water discharge to impact water and sediment quality at Milne Port which may then impact lower trophic levels such as benthic invertebrates and zooplankton. In addition, on the basis of concerns about the risk of invasive species introductions into the marine environment both from ballast water discharges and hull fouling, DFO recommended that Baffinland develop a monitoring program to evaluate the impact of ballast water inputs on the marine environment and to monitor for non-native species introductions.<sup>116</sup>

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<sup>112</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 29, 2014, pp. 668-669, lines 14-26 and lines 1-11.

<sup>113</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 76, lines 1-6.

<sup>114</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 108, lines 5-8.

<sup>115</sup> Exhibit 55, NIRB Public Hearing File No.: 08MN053, January 31, 2014 filed by Baffinland, “Project Certificate 005 Amendment Considerations for Early Revenue Phase”, dated January 31, 2014.

<sup>116</sup> Fisheries and Oceans Canada, Final Written Submission, January 13, 2014.



At the Public Hearing for the ERP Proposal DFO also introduced the newly released *National Risk Assessment for the Introduction of Aquatic Nonindigenous Species to Canada by Ballast Water*<sup>117</sup> to reconsider the probability of survival of non-indigenous species transported by international ships arriving at Milne Port during ERP operations. DFO's findings of the national risk assessment for the ERP Proposal indicate that based on this most recent analysis, the final invasion risk for the Rotterdam-Milne Inlet pathway could be ranked at the highest level. Recognizing these findings, DFO concluded that the environmental effect of ballast water discharge may be more significant than previously indicated despite ballast water exchange regulations because the new assessment suggests that the effect of the temperature differential between mid-ocean exchange ballast water and arctic marine waters may not be as effective in reducing the risk of survival of non-native species. On this basis, DFO concluded:

*The overall conclusion of the new national risk assessment carried out by Fisheries and Oceans and Canada was that the environmental effect of ballast water discharge may be more significant than was previously indicated, despite ballast water exchange regulations.*

*The proposed early revenue phase shipping would make Milne Inlet the top Arctic port at risk for aquatic nonindigenous species by ballast water. Given approximately 53 ballast water discharges per year, an annual total of 662,000 tons of ballast water discharge, the early revenue phase would make Milne Inlet the most active Arctic port. The estimated annual discharge would place Milne Inlet as Canada's 14th largest receiver of ex -- of foreign exchange ballast water. If ballast water discharge resulted in the release and survival of nonindigenous species, the effects would likely be nonreversible.*<sup>118</sup>

As a result, DFO recommended that ballast water treatment be considered rather than ballast water exchange, a contingency plan developed in the event that ballast water exchange or treatment is not effective and a detailed monitoring program at a number of sites over the life of the project to evaluate changes to the marine habitat, organisms and the introduction of non-native species resulting from the project-related shipping associated with the ERP Proposal.

The Qikiqtani Inuit Association (QIA) also found that the FEIS Addendum conclusions on ballast water discharge associated with ERP shipping activities was not adequately assessed and suggested mitigations were also considered to be inadequate. QIA found that ballast water discharges could adversely affect animal and plant populations and thereby affect biological productivity in the Milne Inlet receiving environment. The QIA noted that the introduction of invasive species is of greater concern as it could have unpredictable, far-reaching effects on the regional ecology and expressed concern that the level of

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<sup>117</sup> Exhibit 20, NIRB Public Hearing File No.: 08MN053, January 28, 2014 filed by Fisheries and Oceans Canada, Technical Paper "National Risk Assessment for Introduction of Aquatic Nonindigenous Species to Canada by Ballast Water" Canadian Science Advisory Secretariat (CSAS) Research Document 2013/128, January 2014, English.

<sup>118</sup> G. Williston, Fisheries and Oceans Canada, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, pp. 438-439, lines 23-26 and lines 1-14.

uncertainty is too high to permit a reasonable assessment of the environmental risks posed by ballast water.<sup>119</sup>

The QIA's recommendations included treatment of ballast water in addition to mid-ocean exchange as a means of reducing risk and uncertainty since the impacts of invasive species can be high and irreversible. The QIA also recommended that Baffinland recalculate its dispersal modelling and risk assessment taking into consideration mid-ocean exchange on its own as well as in combination with ballast water treatment options that offer the best potential for mitigating risks from invasive species introduction. In addition, QIA found that Baffinland should implement a robust monitoring program prior to the discharge of any ballast water into Milne Inlet and that options for adaptive management should be identified for defined thresholds.

The Hamlet of Pond Inlet also expressed considerable concern that ballast water would be released for the ERP Proposal in the relatively enclosed environment of Milne Inlet, and echoed the recommendations of DFO and the QIA that a high level of caution be exercised when developing mitigation and monitoring measures associated with ballast water discharge, thanking DFO specifically for: "...for your cautious approach and for taking the precautionary principle and supporting a lot of the things that the Hamlet of Pond Inlet has raised as concerns."<sup>120</sup>

A community representative from Arctic Bay indicated that during the operation of the Nanisivik mine, the community had first-hand experience with the potential for impacts of ballast water discharges into that bay. He indicated that during his 20 years working at the Nanisivik mine he observed that ships would arrive at the dock and discharge their ballast water twice daily along the shoreline at the beach before taking on cargo, but he noted that these ballast water discharges did not appear to have had an impact on the marine mammals.<sup>121</sup>

#### Ship Wakes, Erosion and Effects on Shorelines

Environment Canada (EC) accepted the conclusions in Baffinland's assessment in the FEIS Addendum that wakes created by the ERP Proposal project-related shipping activities would not impact shoreline birds, on the basis that the ore carriers travelling through Eclipse Sound and Milne Inlet will be moving at reduced speeds, and that Baffinland's modelling indicates that wakes will not exceed mean seasonal wave heights in areas of concern. EC therefore accepted Baffinland's predictions that ship wakes are unlikely to impact low lying migratory bird habitat.<sup>122</sup>

In its final written submission to the Board, Natural Resources Canada (NRCan) indicated that ship wakes from the ERP proposed shipping activities will likely increase the frequency of moderate to high waves,

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<sup>119</sup> The Qikiqtani Inuit Association, Final Written Submission, January 15, 2014, at pp. 15-21.

<sup>120</sup> S. Elverum, Hamlet of Pond Inlet, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, p. 449, lines 23-26.

<sup>121</sup> T. Tatatuapik, Community Representative, Arctic Bay, NIRB Public Hearing File No.: 08MN053 Transcript, File No.: 08MN053 Transcript, January 29, 2014, p. 647, lines 7-15.

<sup>122</sup> M. Dahl, Environment Canada, NIRB Public Hearing File No.: 08MN053 Transcript, File No.: 08MN053 Transcript, January 28, 2014, p. 420, lines 11-16.

and thus cumulative wave energy on the shoreline, effectively changing the wave energy climate in the area.<sup>123</sup> NRCan recommended that Baffinland conduct analyses to determine the anticipated wakes generated from range of vessels that will be transiting Milne Inlet and to conduct analyses of effects of cumulative wakes on wave energy climate in Milne Inlet. Baffinland responded to NRCan that it feels that the modelling completed for Steensby Inlet in the FEIS (FEIS Appendix 8A-1) based on larger vessel sizes, faster speeds and shallower channels than would occur at Milne Inlet presents an over-estimation and shows that the area that would be most affected is an area with low sensitivity to waves.

The Hamlet of Pond Inlet also recommended that monitoring of erosion be conducted along the ERP Proposal's shipping route, including at Milne Inlet, Eclipse Sound and the coastline at the entrance to Baffin Bay.<sup>124</sup>

### Shipping Route

The Hamlet of Pond Inlet felt that the ERP Proposal shipping route is too close to Savik on the western side of Milne Inlet and that this would have great potential to disrupt an important harvesting and camping area for Inuit. The Hamlet proposed that the shipping route be moved closer to the eastern side of the entrance of Milne Inlet. In addition, the Hamlet felt that the number of ships proposed for the ERP combined with the size and speed of such ships would create ship wakes that could be harmful to the land (erosion), animals (shorebirds nesting and other species) and to Inuit subsistence hunting.

<sup>125</sup>

Similarly, at the Public Hearing, Parks Canada requested that Baffinland provide additional information regarding potential modifications to the northern shipping route following the identification of sensitive areas along the ERP shipping route.<sup>126</sup>

EC recommended in its final written submission to the Board and at the Public Hearing that a limit be placed on the number of ship transits into Milne Inlet per year as part of the ERP to reduce the potential for adverse impacts, as was done for Steensby Inlet in Project Certificate No.: 005, Term and Condition #179 for the Approved Project.

*To further reduce impacts to migratory birds in these areas, EC also recommended that a limit be placed on the annual number of ship transits into Milne Inlet. Baffinland objected to this recommendation, and it indicated that it was impossible to predict the size of available contract vessels which would ultimately dictate the number of transits required in a given year. Environment Canada understands that there are considerations that may necessitate operational flexibility in northern projects, and we appreciate the clarification that the proponent gave today; however,*

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<sup>123</sup> Natural Resources Canada, Final Written Submission, January 13, 2014 at p. 5.

<sup>124</sup> Hamlet of Pond Inlet, Final Written Submission, January 13, 2014.

<sup>125</sup> Hamlet of Pond Inlet, Final Written Submission, January 13, 2014.

<sup>126</sup> A. Stoddart, Parks Canada, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 129, lines 15-20.

*Environment Canada is of the opinion that there must be a limit to that flexibility to ensure that monitoring and adaptive management remain adequate.*<sup>127</sup>

EC further recommended that Baffinland engage in migratory bird research and monitoring along the proposed ERP shipping route and as a result, at the NIRB Technical Meeting in Iqaluit in November 2013, Baffinland committed to collaborating with EC on migratory bird studies in Milne Inlet and Eclipse Sound.

#### Potential Fuel Spills along the Shipping Route

At the Public Hearing, Transport Canada (TC) advised Baffinland that it should take into consideration the remoteness and reality of operations, particularly in regard to responding to a spill and seeking outside assistance, as there are no response organizations in the Arctic.<sup>128</sup>

The QIA found that the risk of fuel spills or the impacts of such a spill occurring along the proposed ERP shipping route was not adequately assessed in the FEIS Addendum. QIA recommended that Baffinland assess the risk of ERP Proposal-related shipping accidents noting areas along the shipping route where vessels may be particularly vulnerable to environmental conditions including sea ice. It was further recommended that Baffinland reassess its spill predictions to inform its spill response planning.<sup>129</sup>

In its technical review comments to the Board EC recommended that spill trajectory modelling be done through Eclipse Sound and in the vicinity of Cape Graham Moore to help inform Baffinland's spill response planning.<sup>130</sup> EC found that a major fuel spill along the proposed shipping route poses the largest threat to marine birds and has the potential to cause large and long-lasting negative effects on local marine ecosystems. Baffinland committed to ongoing discussions with EC to define additional modelling requirements that will be useful in establishing priority response.<sup>131</sup>

#### Overwintering of Fuel Vessels in Milne Inlet

Transport Canada indicated that: "any vessels that overwinter in Milne Inlet will be subject to all requirements of the Canada Shipping Act, 2001, and the Arctic Water Pollution Prevention Act and their associated regulations."<sup>132</sup>

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<sup>127</sup> M. Dahl, Environment Canada, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, pp. 420-421, lines 17-26 and lines 1-4.

<sup>128</sup> P. Topping, Transport Canada, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, pp. 488-489, lines 26 and lines 1-7.

<sup>129</sup> The Qikiqtani Inuit Association, Final Written Submission, January 15, 2014, at pp. 10-14.

<sup>130</sup> Environment Canada's Technical comments regarding the Addendum to the FEIS submitted by Baffinland in support of the Early Revenue Phase Proposal (NIRB: 08MN053), October 16, 2013, at p. 26.

<sup>131</sup> NIRB, Commitment List from Technical Meeting for the Mary River ERP in Iqaluit, November 29, 2013.

<sup>132</sup> P. Topping, Transport Canada, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, p. 487, lines 7-10.

### 4.11.3 Views of the Board

#### Potential Impacts of Ballast Water Discharge into Milne Inlet

As noted in the Review of the original Mary River Project Proposal, the NIRB, DFO, the QIA and Baffinmiut in general are all concerned about the potential for ballast water discharges to introduce an invasive species that could have irrevocable and lasting effects on the ecosystem. The Board recognizes that there is a great deal of uncertainty surrounding effects and also regarding the best practices to limit the risks associated with ballast water discharges. As summarized by DFO in the Public Hearing, in response to a question from Board Member Glenn McLean:

*In Canada, there has been a long history of shipping, and when we look at the evolution of ballast water management where -- in the Great Lakes is where a lot of our shipping started, we can see what happens when there is no management of ballast water. The Great Lakes have had lots of different introductions of invasive species and negative consequences, also along the east and west coast. Fortunately, we haven't had any introductions into the Arctic yet, probably because there hasn't been a high level of shipping there and [there has] not [been] a high volume of ballast water coming in.*

*So what we're hoping for and the reason the new national risk assessment framework has been done -- and internationally there seems to be an increased awareness of consequences of ballast water introductions and the establishment of evasive [sic, invasive] species, which is why the convention was proposed and countries are encouraged to sign on, and -- and our colleagues at Transport Canada are looking at changing the way ballast water is measured because it's -- the smallest organisms, when -- the current risk assessment looks at plankton and zooplankton, the smallest little food sources because they can get easily pulled in with the water and pumped out at the other end into water where they can or can't survive. So it's -- the whole ballast water management issue is global, and I think Transport Canada and Fisheries and Oceans Canada tried to work together to find the best solution for Canada and the best solution for the Arctic, knowing that the Arctic is going to -- to become active. There's going to be more active shipping than the Baffinland proposal, and there's other proposals too. So we're hoping that the regulations come into force soon enough and that ballast water introductions will not be a reality in the Arctic -- or invasive species introductions won't be a reality in the Arctic.<sup>133</sup>*

Although the Board recognizes that the overall, global regulatory regime is currently being reconsidered by Canadian and international regulators, the NIRB is necessarily focused on the project-specific effects of ballast water in this reconsideration. Given the high level of uncertainty, the recent risk assessment

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<sup>133</sup> G. Williston, Fisheries and Oceans Canada, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, pp. 480-481, lines 7-26 and lines 1-16.

data provided by DFO at the Public Hearing and the potential for significant, lasting harm, the Board is applying a higher standard of caution under the precautionary principle and in association with this higher standard, a more stringent approach to adaptive management of ballast water. The revisions to the ballast water management terms and conditions of Project Certificate No.: 005 reflect this more stringent approach, and include measures, such as testing and verifying salinity prior to discharge that were agreed to by Baffinland but that exceed the current regulatory requirements of Transport Canada.

Although applying this higher standard, the Board does recognize the practical limitations of mandating that all vessels discharging ballast water be required to employ both mid-ocean exchange and ballast water treatment. As noted by Transport Canada:

*... the function of the difficulty to find a vessel with a treatment system is not so much as an impact of Canada but of a global concern. The world fleet, as it stands, only has about 2 percent of its vessels with ballast water treatment systems, and this is because the convention that will require this is not yet enforced [sic in force].<sup>134</sup>*

On this basis, the Board has not included a term or condition mandating ballast water treatment, but has included the requirement that, whenever feasible, Baffinland give preference to shipping contractors with ballast water treatment capability.

#### Ship Wakes, Erosion and Effects on Shorelines

Although the Board notes that key intervenors such as NRCan and EC accepted Baffinland's conclusions that significant wake effects are unlikely given the slow speeds of the vessels transiting Milne Inlet and the distance from shore, the Board also notes that actual conditions can sometimes vary considerably from predicted conditions. Given the importance of the shoreline habitat to wildlife, birds and the harvesters who rely on marine and terrestrial species in these areas, the Board has revised several terms and conditions to ensure that monitoring to confirm predictions is conducted and that if effects greater than predicted are identified that management actions will be developed.

Further, the Board's concerns over the potential for construction and operation of the port facility at Milne Inlet to result in impacts on the marine environment due to disturbance, redistribution of sediment and the potential for ore being released into the marine environment has also been addressed by the Board adding a new term and condition in this section.

#### Proposed Shipping Route

The Board recognizes that the ERP Proposal, despite being reduced in scale and duration from the shipping proposed under the Approved Project, still represents an unprecedented level of shipping during the open water season in relatively close proximity to the community of Pond Inlet. As stated by the Proponent if the ERP Proposal proceeds, it will result in:

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<sup>134</sup> P. Topping, Transport Canada, NIRB Public Hearing File No.: 08MN053 Transcript, p. 447, lines 20-26.

*...one ship passing by Pond Inlet approximately every 16 hours in either direction during the open-water season. And this community of Pond Inlet will be the only community along the route that will -- will see the ships from shore.<sup>135</sup>*

It should be noted that the Board's response to limiting and mitigating the potential for impacts associated with shipping along the proposed route is also set out in revisions recommended to terms and conditions under other overlapping sections of this Report, such as Sections 4.2 and 4.12 Marine Wildlife. Although parties sought for the Board to put limits on the number of ship transits via Milne Inlet, the NIRB recognizes that until vessels have been contracted for the shipment of ore, it is very difficult to predict the size, type and number of vessels. Consequently, rather than place a limit on the number of vessel transits via Milne Inlet, the Board has recommended an addition to the terms and conditions in Project Certificate No.: 005 to limit the total volume of ore that can be shipped from Milne Inlet in a given calendar year to 4.2 million tonnes (this item is discussed in Section 6.5 Operational Variability/Flexibility of this Report).

#### Potential Fuel Spills along the Proposed Shipping Route

Although the Board recognizes that the requirements of TC with respect to emergency response planning and is reassured that all project vessels are required to comply with pollution prevention planning requirements, given the lack of capacity with respect to emergency response support for Baffinland's shipping operations in Nunavut, and the severity of harm that could result if a large fuel spill event were to occur, the Board has taken a precautionary approach to modelling, management and monitoring in this area as well. The Board's suggested revisions to the spill prevention terms and conditions listed below and provided in Section 8 focus on prevention and planning to ensure that the risk of spills occurring is limited from the outset.

#### Overwintering of Fuel Vessels in Milne Inlet

Despite the request of Baffinland and the indication from TC to the effect that Transport Canada would regulate any proposed overwintering of fuel vessels by Baffinland whether in Steensby Inlet or Milne Inlet, in the Board's view, it does not appear that there has been any substantive discussion of this possibility with the community of Pond Inlet. In addition, the Board saw no evidence that the potential environmental impacts of this type of activity have been fully assessed in the context of such activities occurring in Milne Inlet. Consequently, the Board has not amended existing terms and conditions 93-96 to allow for over-wintering of fuel vessels in Milne Inlet.

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<sup>135</sup> E. Madsen, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 41, lines 12-17.

#### 4.11.4 Conclusions and Recommendations of the Board

Terms and conditions 76 through 98 of the existing Project Certificate address Marine Environment, Marine Water/Ice and Sediment Quality.

The following existing terms and conditions require no changes: 78, 82, 84, 85, and 93-96.

The following existing terms and conditions require no changes but should be applied to the ERP: 76, 79-81, 92 and 98.

The following existing terms and conditions require minor revision and should be applied to the ERP: 77, 83, 86-91, and 97.

**Condition 77:** revised to add Parks Canada and the Mittimatalik Hunters and Trappers Organization to the membership of the Marine Environment Working Group.

**Condition 83:** revised to add Milne Inlet to the requirements for the installation of tidal gauges.

**Condition 86:** revised to add Milne Inlet to the requirements for ballast water discharge modelling.

**Condition 87:** revised to add Milne Inlet to the requirements for ballast water discharge monitoring.

**Condition 88:** revised to not only apply to the Early Revenue Phase Proposal but also to incorporate updated risk assessment data received from Fisheries and Oceans Canada at the Public Hearing.

**Condition 89:** revised to not only apply to the Early Revenue Phase Proposal but also to require ship owners to test their ballast water to confirm that it meets the salinity requirements of the applicable regulations prior to discharge at the Milne Port and to give preference to contract shippers with ballast water treatment capabilities.

**Condition 90:** revised to expressly reference the applicable regulatory regime as it may change over time.

**Condition 91:** revised to expressly reference the applicable regulatory regime as it may change over time.

**Condition 97:** revised to require additional spill dispersion modelling along the Northern and Southern shipping routes in consultation with the Marine Environment Working Group.

The Board has added term and condition 83(a) to address the potential for sediment redistribution and shoreline effects associated with the construction and operation of ore shipping from Milne Inlet Port, which is worded as follows:

The Proponent shall conduct hydrodynamic modelling in the Milne Inlet Port area to determine the potential impacts arising from disturbance to sediments including re-suspension and subsequent transport and deposition of sediment. The modelling results shall be used to update the marine water and sediment quality monitoring and mitigation program to include activities associated with the construction of the Milne Inlet port. The monitoring program shall include an ongoing assessment of the potential introduction of metals that bio-accumulate in the marine food chain.



## **4.12 Marine Wildlife and Marine Habitat**

### **4.12.1 Views of the Proponent**

Volume 8 of Baffinland's FEIS Addendum addressed the marine environment, with updated information related to effects assessments for marine habitat, arctic char, marine mammals (including ringed seal, walrus, beluga, narwhal, bowhead whale, polar bear and bearded seal) presented.

The FEIS Addendum identified two sources of potential impacts to the marine environment: the construction and operation of an ore-handling port at Milne Inlet ('Milne Port') and shipping associated with the ERP. Shipping proposed for the ERP would occur during the open water season (*i.e.*, 'ice free period') from approximately July 15 to October 15 each year with some seasonal variability. While the number of ship transits required is a function of the size of vessels secured through the open market, for the purposes of its assessment Baffinland assumed up to 55 transits by ore carriers ranging from 50,000 to 110,000 DWT would be used each season, with an assumption of approximately 70 days within each 90 day open water season being navigable.

The assessment presented within the FEIS Addendum concluded that no significant residual effects are expected from the construction and operation of the ore dock at Milne Port, with effects to marine wildlife and marine habitat being prevented or mitigated through habitat offsetting and continued monitoring to evaluate the accuracy of predictions. Baffinland similarly concluded that, taking into account implementation of mitigation measures, the shipping associated with the ERP is not expected to have any significant incremental environmental impact.

Baffinland has confirmed that the plans and programs identified as part of the approved Mary River Project will continue to apply to the ERP, with the objective of minimizing the impacts of shipping on marine mammals. These plans and programs include:

- The Shipping and Marine Wildlife Management Plan (FEIS, Volume 10, Appendix 10D-10);
- The Environmental Effects Monitoring Program (FEIS, Volume 10, Appendix 10D-13);
- The additional commitments made with respect to the EEM Program as part of the Mary River Project Final Hearing; and,
- The establishment and operation of the Marine Environment Working Group (MEWG).

The FEIS Addendum acknowledged uncertainty in predictions about narwhal avoidance response to ship transits during the open-water period; therefore, Baffinland committed to rigorous monitoring of the effects of shipping on narwhals and other marine mammals, particularly bowhead whales.<sup>136</sup> However, Baffinland's position contended that marine mammals were at very minimal risk of being struck by project vessels, particularly given the relatively slow ship speed ore vessels would travel at along the ERP Proposal shipping route (7 to 10 knots) and the fact that marine mammals swim out of the way of

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<sup>136</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 82, lines 1-7.

ships.<sup>137</sup> Baffinland further noted that its position was validated by the most comprehensive study of the effects of ship speed that found that strikes on right whales (some of the most vulnerable species) were reduced by over 90% when ships were travelling slowly. In addition to the reduced shipping speed along the ERP shipping route, other possible mitigation measures Baffinland noted it might consider implementing include the use of larger ships to reduce the number of vessel transits and convoying of ships to create gaps in shipping activity.<sup>138</sup>

At the Public Hearing for the ERP Proposal, Baffinland spent considerable time outlining the regulatory requirements associated with shipping for the ERP, while also describing a range of additional mitigation measures could be employed in regards to potentially sensitive time periods for marine mammals along the shipping route, if required. If environmental effects and monitoring determined there were effects that warranted mitigation, then shipping schedule changes would be one such option that could be considered (e.g., route alterations or reducing the amount of shipping during sensitive time periods for a certain species).<sup>139</sup>

During the Public Hearing Baffinland also outlined its expectation that relevant provisions of the current Project Certificate relating to shipping and to the marine environment and marine mammals will continue to apply with any modifications appropriate to the ERP (Project Certificate terms and conditions 76 to 128). With regards to a number of existing terms and conditions in the approved Project Certificate, within submissions to the NIRB Baffinland highlighted its concerns that the current wording is considered to be duplicative of existing regulatory requirements, and should be revised to reduce the risk of conflicts should these requirements change in the future.<sup>140</sup>

#### **4.12.2 Views and Concerns of Interested Parties**

A number of intervenors expressed concern in their final written submissions to the Board regarding potential impacts of the proposed port construction at Milne Inlet and the ERP's shipping activities on marine wildlife, specifically arctic char and marine mammal species. As the QIA summarized in its final written submission to the Board, the responses of marine mammals in the Arctic to the scale of shipping proposed in the ERP are completely unknown, as there has never been shipping of this magnitude through Milne Inlet or elsewhere in the Canadian Arctic. Marine mammals are socioeconomically and culturally important to Inuit communities and negative impacts to marine mammal species could result in substantial impacts to local residents.<sup>141</sup>

Within Fisheries and Oceans Canada's (DFO) final written submission to the Board, DFO expressed its concern that given the intensity of ERP shipping activity, the duration of the project (*i.e.*, 21 years) and

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<sup>137</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 29, 2014, p. 642, lines 3-8.

<sup>138</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, pp. 82-83, lines 18-26 and lines 1-14.

<sup>139</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, pp. 125-126, lines 24-26 and lines 1-12.

<sup>140</sup> Exhibit 55, NIRB Public Hearing File No.: 08MN053, January 31, 2014 filed by Baffinland, "Project Certificate 005 Amendment Considerations for Early Revenue Phase", dated January 31, 2014.

<sup>141</sup> The Qikiqtaqni Inuit Association, Final Written Submission, January 15, 2014.

the abundance of whales in the Milne-Eclipse area, there would be potential for ship-marine mammal collisions which could result in injury or mortality for whale species. DFO also outlined concerns regarding exposure to shipping-related noise in an otherwise pristine environment that may lead to negative effects on the health and behaviour of marine mammals in the vicinity of the proposed shipping route.<sup>142</sup>

During the Public Hearing, DFO updated the Board on the work undertaken by Baffinland to address DFO's concerns regarding potential impacts to marine mammals and incorporate the department's recommendations into the design of monitoring programs. DFO stressed the need for Baffinland to finalize and implement its monitoring programs prior to the commencement of ore shipments for the ERP, and collect additional baseline acoustic data before the construction of port facilities and shipping activities for the ERP commence. It was DFO's opinion that monitoring of marine mammal populations should occur throughout the life of the project in areas surrounding the proposed shipping activities.<sup>143</sup>

At the Public Hearing DFO questioned Baffinland's assertion that, given the short open-water shipping season from Milne Port (approximately 70-90 days), if it were determined through effects monitoring programs that ERP-related shipping activities was having an impact on a species (*e.g.*, narwhal) during a critical period for that particular species, it would be a feasible option to employ mitigation measures such as reducing and/or stopping iron ore ship transits.<sup>144</sup> In response, Baffinland confirmed that, should monitoring indicate that a significant effect is occurring, all necessary measures would be implemented including reducing and/or stopping iron ore ship transits to address the effect. Baffinland further clarified that it realized that this could reduce the overall amount of ore that was shipped in a year and require the company to compensate with additional shipments/larger shipments the following year.<sup>145</sup>

DFO recommended that Baffinland finalize its proposed monitoring program for impacts of shipping on narwhals and bowhead whales prior to the commencement of iron ore shipments. In addition, DFO stated that Baffinland should continue to collect marine mammal baseline data required to support monitoring programs associated with the ERP, including baseline acoustic data and marine mammal acoustic behaviour prior to the construction of the Milne Port dock and commencement of iron ore shipments.<sup>146</sup>

Within its final written submission to the Board, Aboriginal Affairs and Northern Development Canada (AANDC) noted that during the NIRB community consultation sessions conducted in October 2013, the principle cause for public concern in the communities as documented by AANDC was the potential impact of shipping on the marine environment, in particular on marine mammal populations.<sup>147</sup>

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<sup>142</sup> Fisheries and Oceans Canada, Final Written Submission, January 13, 2014.

<sup>143</sup> G. Williston, Fisheries and Oceans Canada, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, p. 436-437, lines 14-26 and lines 1-5.

<sup>144</sup> G. Williston, Fisheries and Oceans Canada, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 126-127, lines 21-26 and lines 1-8.

<sup>145</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 127-128, lines 10-26 and lines 1-3.

<sup>146</sup> DFO, Final Written Submission, January 14, 2014.

<sup>147</sup> AANDC, Final Written Submission, January 14, 2014.

The QIA concluded that the impacts of vessel noise may be much greater than Baffinland's predictions in the FEIS Addendum and the level of certainty in Baffinland's predictions is low. Additional work is required to ensure that monitoring plans are robust and that appropriate mitigation options are identified (which could require a complete cessation of shipping, depending on the degree of impact). QIA recommended that the Proponent conduct verification studies to assess the accuracy of its sound propagation models and associated zone of impact and acoustic monitoring programs should be developed immediately.<sup>148</sup>

The MHTO felt that the ERP would greatly impact the animals surrounding Pond Inlet and at Milne Inlet. Of particular concern was the increase in the number of ships that would be passing by Pond Inlet to get to Milne Inlet (approximately 54 ore shipments out of Milne Inlet through Pond Inlet between July and October, in addition to a number of sealift vessels and tanker ships required annually). The MHTO concluded that this level of activity would amount to significant marine traffic within reach and view of the community of Pond Inlet. During the Public Hearing the MHTO specifically requested that a new condition be added to the Project Certificate to require Baffinland to consult with the MHTO to identify ideal ore vessel anchor site locations.<sup>149</sup>

The MHTO was concerned that this significant increase in marine traffic could create waves which would negatively impact the hunters travelling towards Milne Inlet, which is an important hunting site as it is the calving ground for narwhals. Narwhals are not only a vital source of food for the community, but the narwhal is also an important economic support for community members who harvest tusks and maktaaq (blubber). The MHTO would like to see that Baffinland vessels sail slower (8 to 10 knots) in the Pond Inlet and Milne Inlet region to limit the wave height and their potential impact on local hunters conducting harvesting activities.<sup>150</sup>

Pond Inlet community member Gamailie Kulikishak's written submission to the Board stated that transporting iron ore through Eclipse Sound had not been approved by the people of Pond Inlet because marine mammals (particularly seals) in the Button Point area start passing through Eclipse Sound in June and July to meet other seals in the Inlet to mate and these marine mammals should not be disturbed by ships. Similarly, the World Wildlife Fund (WWF) expressed concern that the northern shipping route for the ERP would go through waters that support a significant percentage of the world's narwhal population and the proposed increase in ship traffic through this region could cause significant impacts to this highly valued marine area where thousands of narwhals use the waters as a nursery and summering area.<sup>151</sup>

WWF indicated in its final written submission to the Board that the impacts of the ERP shipping activities are not fully known and the effectiveness of planned mitigative measures is also uncertain.<sup>152</sup> It is for

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<sup>148</sup> QIA, Final Written Submission, January 15, 2014.

<sup>149</sup> A. Killiktee, Mittimatalik Hunters and Trappers Organization, NIRB Public Hearing File No.: 08MN053 Transcript, January 29, 2014, p. 573, lines 1-4.

<sup>150</sup> Mittimatalik Hunters and Trappers Organization, Final Written Submission, January 13, 2014.

<sup>151</sup> Gamailie Kulikishak, Final Written Submission, January 13, 2014.

<sup>152</sup> WWF, Final Written Submission, January 13, 2014.

these reasons that it would be essential to conduct adequate monitoring of the marine environment and marine mammals to detect any changes in marine habitat or marine mammal behaviour as the project gets underway. As the Government of Nunavut (GN) pointed out at the Public Hearing for the Mary River ERP Proposal, Baffinland has already committed to include Milne Inlet and Eclipse Sound as marine mammal monitoring program locations to enable sufficient monitoring of any possible changes to the behaviour of marine mammals.<sup>153</sup>

At the Public Hearing for the ERP Proposal, Aboriginal Affairs and Northern Development Canada (AANDC) stated that given the noted concerns, particularly on the potential impacts to marine mammal populations from ERP activities, AANDC is supportive of the use of a precautionary approach and would like to stress the importance of monitoring moving forward, as well as the need for established and effective adaptive management strategies.<sup>154</sup>

During the Public Hearing Elijah Panipakoocho of Pond Inlet shared his observations of the impacts of Baffinland's shipping activities since approximately 2004-2005 when they began their exploration work in the region:

*We were concerned that the whales and fish would be impacted as a result of shipping, but what I noticed was that there appeared to be only minor impacts and last summer I participated in the Bruce Head Narwhal Study and saw that there is an abundance of whales, but when the ships start to come, the whales get impacted a little bit, and they swim away from the region. I wonder if, perhaps, for the ERP Project, the ships could slow down to 6 knots as we noticed that when ships moved at a faster speed the impact to marine mammals was greater.*<sup>155</sup>

Simon Idlout of Resolute Bay echoed Elijah Panipakoocho's comment at the Public Hearing, noting that the animals weren't scared of the ships at the Nanisivik mine, as long as the ships were coming in slowly. Walrus, seals, bearded seals, they were completely habituated to it, but they were scared of ships when the ships were moving quickly.<sup>156</sup>

During the Public Hearing the MHTO stressed its concerns regarding the potential of shipping associated with the ERP to impact upon arctic char harvested by the community, noting its desire to see further research carried out in the area of Koluktoo Bay:

*The HTO admit the -- the char will be -- there will be an impact to the char, especially around the Koluktoo Bay area. We predict that the -- the pop -- the char*

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<sup>153</sup> R. Katsak, Government of Nunavut, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, p. 379, lines 4-7.

<sup>154</sup> K. Costello, Aboriginal Affairs and Northern Development, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, p. 412, lines 9-18.

<sup>155</sup> E. Panipakooch, Community Representative, Pond Inlet, NIRB Public Hearing File No.: 08MN053 Transcript, January 29, 2014, pp. 639-641, lines 23-26, lines 1-2, 14-18, 22-26 and lines 1-6.

<sup>156</sup> S. Idlout, Community Representative, Resolute Bay, NIRB Public Hearing File No.: 08MN053 Transcript, January 29, 2014, p. 651, lines 10-16.

*population will decrease as a result of shipping, and this was made into a recommendation by our Board, that originally Baffinland was going to do some shipping at Steensby Inlet, but there seems -- there seemed to be a study about -- and research about char population, and this was one of the topics that was discussed. We see the char population -- there will be an impact to the char population at Koluktoo Bay. We, the MHTO, had requested that a study be done through the Department of Fisheries and Oceans. We would be happy to conduct this research with the Department of Fisheries and Oceans, as well as Baffinland. This area is being fished for commercial fishing.<sup>157</sup>*

The need for monitoring to address marine fish and fish habitat, specifically arctic char, is required for the approved Mary River Project by current Project Certificate terms and conditions 113-115, which were recommended for revision by the QIA, MHTO and Hamlet of Pond Inlet to address the ERP. Baffinland did not agree with the suggested rewording or the requirement for these specific terms and conditions, as it had concluded that there would be no residual effects to marine fish or marine fish habitat in Project areas, nor is there a specific arctic char stock that will interact with the project to a detectable level. It was also Baffinland's position that the monitoring of arctic char stocks is a government responsibility, and that some of the requirements could be duplicative of other sections of current legislation. Baffinland provided alternative wording for consideration should the Board elect to maintain these terms and conditions and apply them to the ERP.<sup>158</sup>

The MHTO further recommended a specific preferred habitat offsetting measures for DFO's consideration:

*In Koluktoo Bay, there's going to be an impact to the fish there. We would like to work with the Department of Fisheries and Oceans to see if they can build a creek and that there would be -- if there could be somewhere to dredge the creek so that there's a better flow for the fish to pass.<sup>159</sup>*

The MHTO also highlighted its concerns regarding potential impacts of any shipping through Navy Board Inlet on marine mammal and marine fish species, as the current flows from Lancaster Sound through Navy Board Inlet and into Eclipse Sound and this same pathway is used as an entrance into surrounding inlets and waterways for marine wildlife:

*The MHTO had concerns with regards to shipping in -- at Button Point. The MHTO do not wish that the -- that there will be no shipping to the left-hand side, the Navy Board Inlet. Only Coast Guard and merchant vessels should be allowed to traverse through Eclipse Sound on the way to Milne Inlet. They should not be entering*

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<sup>157</sup> J. Pitseolak, Mittimatalik Hunters and Trappers Organization, NIRB Public Hearing File No.: 08MN053 Transcript, January 29, 2014, p. 574, lines 5-21.

<sup>158</sup> Exhibit 55, NIRB Public Hearing File No.: 08MN053, January 31, 2014 filed by Baffinland, "Project Certificate 005 Amendment Considerations for Early Revenue Phase", dated January 31, 2014, at pp. 42-46.

<sup>159</sup> J. Pitseolak, Mittimatalik Hunters and Trappers Organization, NIRB Public Hearing File No.: 08MN053 Transcript, January 29, 2014, pp. 574-575, lines 22-26 and lines 1.

*through the Navy Board Inlet area, excluding emergency search-and-rescue services.*

*So it's definitely our concern that -- according to traditional knowledge that the marine wildlife tend to follow -- the trout tend to travel based on the currents; therefore, we strongly feel that, as water currents move from Navy Board Inlet throughout Button Point, according to Inuit traditional knowledge, animals follow the same movement.<sup>160</sup>*

The MHTO raised concerns regarding the shipping window impacting ringed seals, specifically if passing ore ships might disturb seal pups before they are fully weaned.

The MHTO raised concerns at the Public Hearing regarding anticipated impacts of the proposed shipping on narwhal and marine fish, requesting the NIRB impose monitoring requirements on these activities.

*Like, last year Baffinland Iron Mines conducted marine observation -- a narwhal observation at Bruce Head as to how narwhals react when ships are traversing, and a lot of times, during the monitoring phase, narwhals were submerged for up to one or two hours after ships were in the area, and sometimes, like, the narwhal tend to swim away from the smaller vessels. So if that trend were to continue, some Board members were concerned, like, the narwhal would be losing weight or have some disease. So that was a concern.*

*Also, in regards to char, at Savik Point behaved differently, and they were not growing as much as they usually do. So the char in the Savik area, their populations decreased and their behaviour changed dramatically. So that's a speculation. So can you continue to monitor the changes?<sup>161</sup>*

During the Public Hearing the Hamlet of Pond Inlet expressed concern for the effect of port construction activities during August, a period of key importance for arctic char, narwhal and the people who depend upon them. The Hamlet suggested the community should consider the development of a conflict avoidance agreement with Baffinland, pointing to similar agreements developed for the North Slope of Alaska which were developed to prevent industry from carrying out disruptive activities at times critical to whales and the people of Alaska.<sup>162</sup> The Hamlet requested that the NIRB add new terms and conditions to the Project Certificate which would restrict the carrying out of invasive work in the marine environment to periods where impacts to narwhal calving, fishing and subsistence hunting would not be adversely affected.

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<sup>160</sup> J. Pitseolak, Mittimatalik Hunters and Trappers Organization, NIRB Public Hearing File No.: 08MN053 Transcript, January 29, 2014, p. 575, lines 2-16

<sup>161</sup> J. Pitseolak, Mittimatalik Hunters and Trappers Organization, NIRB Public Hearing File No.: 08MN053 Transcript, January 29, 2014, pp. 577-578, lines 10-26 and lines 1.

<sup>162</sup> S. Elevrum, Hamlet of Pond Inlet, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 147-149, lines 24-26 and lines 1-19.

DFO and the QIA also suggested minor revisions to existing Project Certificate terms and conditions 116-118, which currently address blasting related to port construction at Steensby Inlet, which would broaden the scope of application to include port construction at Milne Inlet and associated pile-driving. The QIA also recommended that the Board revise term and condition 125 to ensure that public engagement is carried out prior to use of acoustic deterrent devices associated with port construction at Milne Inlet.

Within its final written submission and at the Public Hearing for the ERP Proposal the Government of Nunavut requested the NIRB establish a condition that a comprehensive, detailed, prescriptive, and public polar bear safety and response plan be approved by the Government of Nunavut; that the proponent work with the Government of Nunavut to establish baseline and monitoring information on polar bears; and finally, that should an oil spill occur at sea or in the coastal plan, the clean-up plan and associated actions strive to minimize the impacts on polar bears. While noting that a marine fuel spill was unlikely, at the Public Hearing the Government of Nunavut further justified its desire for additional mitigation plans to be put in place:

*In the unlikely event of a spill, polar bears in the vicinity of the spill could become oiled and die. The carcasses may not all be recovered, thus a protocol needs to be developed so that the number of bears killed can be estimated and the appropriate level of compensation determined.*<sup>163</sup>

At the Public Hearing Baffinland reiterated its position that, although polar bears were included as a Valued Ecosystemic Component (VEC) within the FEIS Addendum, it had concluded that there will be no significant residual effects to polar bear from ERP activities. Baffinland explained that it had a comprehensive polar bear safety and deterrence plan in place, as well as a spill response plan that includes consideration for polar bears, and suggesting that the Government of Nunavut's recommendations be brought forward to the existing Marine Environment Working Group for discussion rather than incorporating new requirements in the Project Certificate.<sup>164</sup> Baffinland further noted that Environment Canada is being consulted regarding the scope of additional modelling for fuel spills along the Project's northern shipping route so that this additional information can be of optimal use for emergency response.

### **4.12.3 Views of the Board**

Throughout the course of the Board's reconsideration of Project Certificate 005 in light of the ERP Proposal, it was very clear that proposed shipping through Eclipse Sound and Milne Inlet and the associated potential for effects to marine wildlife and wildlife harvesting was among the primary concerns expressed by parties and the public. The NIRB shares these concerns, recognizing that although the ERP as proposed by Baffinland limits shipping to the open water season and to a route

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<sup>163</sup> P. Hale, Government of Nunavut, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, p. 386, lines 15-21.

<sup>164</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, pp. 80-81, lines 23-26 and lines 1-6.



previously used for resupply and a bulk ore shipment to/from Milne Inlet and annual resupply to Pond Inlet, shipping at the scale of the ERP is unprecedented for this area. As noted by the QIA, the responses of marine mammals in the Arctic to the scale of shipping proposed in the ERP are unknown, and these marine mammal populations are extremely important to the local communities socially, economically, and culturally.

The Board appreciates having received the views of the MHTO with regards to the ERP and supports the desire to have the MHTO join the Marine Environment Working Group (MEWG). The Board further notes that MEWG members were also supportive of this request during the Public Hearing. MHTO members will have unique perspectives to share regarding their knowledge of the Milne Inlet-Eclipse Sound Area, the behaviour of marine wildlife and identification of important marine wildlife habitat. Additionally, MHTO members are active users of the marine environment for harvesting and recreational purposes, and as such should be consulted proactively to ensure development does not encroach on these pursuits. To date the Proponent has demonstrated its intention to have project related shipping respect other users of the marine areas, including marine wildlife, Inuit and community members, and visitors to Sirmilik National Park through implementing speed limits and well defined routes for project vessels. The NIRB has recommended a new term and condition also be added to the Project Certificate to ensure this consultation occurs with Hunters' and Trappers' Organizations and communities throughout the shipping routes for the Mary River Project and its ERP for the life of the Project.

Baffinland has requested approval of the ERP and associated shipping for the entire 21 year mine life of the approved Mary River Project. The NIRB believes that monitoring through the life of the Project will remain important to ensure that any observed impacts to marine wildlife can be mitigated, particularly at key times for migration, reproduction and harvesting. Through the terms and conditions of Project Certificate 005 and other regulatory approvals Baffinland will be required to demonstrate that its project activities are not resulting in adverse effects to marine wildlife and marine habitat, while providing the NIRB and regulators with sufficient evidence with which to monitor for project effects and overall compliance.

It is the NIRB's view that the terms and conditions of the approved Project Certificate are extremely comprehensive and in almost every case could be applied directly to the ERP with small amounts of revision or with no revision at all, and still accommodate the concerns expressed by the Board and parties. In most cases the Proponent has also clearly indicated its willingness to implement these measures and offered its views regarding how best to ensure they have the desired effect and can be effectively implemented. The Board has carefully considered each term and condition and the views of all parties regarding proposed revisions or new terms and conditions before determining what, if any, revisions or additions should be made in each case.

The Board notes that, in many areas very detailed or explicit monitoring requirements were requested by parties for inclusion into terms and conditions of the Project Certificate. In each instance the Board considered the request and whether the inclusion was appropriate or better left to be addressed through the MEWG to allow sufficient flexibility to the Proponent and contributing parties to achieve the desired objective.

#### 4.12.4 Conclusions and Recommendations of the Board

Terms and conditions 99 through 128 of the existing Project Certificate address potential impacts to Marine Wildlife and Marine Habitat.

The following existing terms and conditions require no changes: 119

The following existing terms and conditions require no changes but should be applied to the ERP: 100, 103, 111, 112, 117, 120-124, and 126-128.

The following existing terms and conditions require minor revision and should be applied to the ERP: 99, 101, 102, 104-109, 110, 113-116, 118, and 125.

**Condition 99:** revised to apply establishment of baseline data and monitoring of marine wildlife species in the area of Milne Inlet and the ERP shipping route.

**Condition 101:** revised to clarify expectations for conducting shore based narwhal observations in Milne Inlet.

**Condition 102:** revised to address the northern shipping route for the ERP and remove the requirement for annual submission of ship track summaries.

**Condition 104:** revised to address the northern shipping route for the ERP and clarify expectations for reporting of shipping route deviations.

**Condition 105:** revised to include mitigation measures for marine mammal interactions specific to the northern shipping route for the ERP.

**Condition 106:** revised to address the northern shipping route for the ERP and clarify expectations for considering the function of shipboard monitors for any ore carriers purpose-built for the Project.

**Condition 109:** revised to address the northern shipping route for the ERP and better reflect the associated seasonality of the shipping season.

**Condition 110:** revised to extend the development of monitoring protocols for the Project to the northern shipping route associated with the ERP.

**Condition 113:** revised to extend the required monitoring of Arctic Char to include Milne Inlet.

**Condition 114:** revised to extend the required monitoring of Arctic Char to include the Milne Inlet and Eclipse Sound areas in the event of the development of a commercial fishery.

**Condition 115:** revised to reflect the changed Fisheries Act requirements relating to offsetting of serious harm to fish.

**Condition 116:** revised to clarify expectations with regards to the development of mitigation measures related to blasting and marine fish and fish habitat.

**Condition 125:** revised to address the northern shipping route and development at Milne Inlet for the ERP, and to clarify expectations for consultation with potentially-affected communities.

**Condition 107:** amended to apply this condition to the northern shipping route and to seabirds and seaducks as appropriate to determine the presence of such species.

**Condition 108:** amended to also apply to the northern shipping route and to seabirds and seaducks as appropriate to analyze impacts to bird species from the ERP activities.

*Note: Conditions 107 and 108 have been revised to reflect the Birds Section 4.10.4 Board recommendations.*

The following new term and condition **Condition 125 (a)** should be added to the Marine Wildlife and Marine Habitat section:

- The Proponent shall consult with potentially-affected communities and groups, particularly Hunters' and Trappers' Organizations regarding the identification of project vessel anchor sites and potential areas of temporary refuge for project vessels along the shipping routes within the Nunavut Settlement Area. Feedback received from community consultations shall be incorporated into the most appropriate mitigation or management plans.

## **5. SOCIO-ECONOMIC EFFECTS**

### **5.1 Introduction**

The focus of the Final Environmental Impact Statement (FEIS) Addendum was to identify how interactions between Early Revenue Phase (ERP) project components and the identified Valued Socio-economic Components (VSECs) might vary from the approved Mary River Project and to assess the degree of any potential residual effects associated with ERP Proposal components. The following VSECs considered in the FEIS for the Mary River Project were not brought forward for consideration within the FEIS Addendum, as Baffinland concluded the addition of the ERP Proposal components did not result in a change to the effects assessment performed for the approved Mary River Project:

- Population Demographics;
- Community Infrastructure and Public Services;
- Benefits, Royalty and Taxation (the ERP contributes a change to the timing and magnitude of tax and royalty payments; however Baffinland concluded that this modest change did not affect the results of the assessment from the approved Mary River Project); and
- Governance and Leadership.

The same Local Study Area (LSA) is used in the socio-economic assessments for the FEIS Addendum and FEIS: the five North Baffin point of hire communities (Arctic Bay, Clyde River, Hall Beach, Igloolik and Pond Inlet), as well as Iqaluit.<sup>165</sup>

### **5.2 Education and Training**

#### **5.2.1 Views of the Proponent**

The Final Environmental Impact Statement (FEIS) Addendum predicted that labour demand for the Early Revenue Phase (ERP) was expected to continue to exceed the supply capacity of the Local Study Area (LSA) labour force, with Baffinland clarifying during the public hearing that 420 additional positions would be needed during the life of the Project with the ERP.<sup>166</sup> Therefore, Baffinland noted the interactions between the ERP Proposal and the Education and Training Valued Socio-economic

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<sup>165</sup> FEIS Addendum, Volume 4, Section 1.0.

<sup>166</sup> E. Madsen (Baffinland), NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 285, lines 13-16.

Component (VSEC) were not expected to be functionally or quantitatively affected by the additional jobs created by the addition of ERP components.

Baffinland stated in the FEIS Addendum that training to support the progression of local residents from lower to higher-skilled positions continues to be of high importance. It also noted that the addition of haul truck operator jobs associated with the ERP's proposed transport of iron ore would expand career opportunity diversity and would contribute to broader training opportunities relative to baseline conditions. As the FEIS had assessed the expansion of training opportunities, no changes were made in the FEIS Addendum effects assessment on Education and Training for the ERP.<sup>167</sup>

At the public hearing for the ERP Proposal, Baffinland indicated that two Training Coordinator positions had been created by Baffinland and the Qikiqtani Inuit Association (QIA), and that these positions would develop training strategies for the respective LSA communities. Baffinland further indicated that it intends to work within the North Baffin communities to develop various training programs to assist in meeting the workforce needs of the ERP Proposal.<sup>168</sup>

## **5.2.2 Views and Concerns of Interested Parties**

In its final written submission to the Board, the QIA did not endorse Baffinland's conclusion that there would be no change in education and training and career advancement opportunities associated with the ERP Proposal. The FEIS Addendum stated that the project labour demand for the approved Mary River Project was at least three-quarters of the LSA labour supply (262,000 hours) at a skill level D (on-the-job training/ no specific education required), where training efforts would be made to bring these entry-level workers up to a Level C position (secondary school/occupation specific training) during the construction phase. However, Baffinland did not revise its Job Progression and Career Advancement effects assessment in the FEIS Addendum to determine how career advancement would take place with the shortened construction phase associated exclusively with the ERP Proposal.<sup>169</sup>

In addition, the QIA felt that an insufficient level of detail had been provided regarding the potential changes to the management of human resources matters onsite if the ERP were to receive approval. The QIA recommended that more rigorous monitoring programs should be in place to ensure that socio-economic impacts of the ERP are assessed adequately and that mitigations are implemented as the phased construction and operation of the Approved Project is undertaken.<sup>170</sup>

The final written submissions of both the Hamlet of Pond Inlet and the Mittimatalik Hunters and Trappers Organization (MHTO) noted (respectively) the limited involvement of community members and the MHTO in the development, design, timing and carrying out of monitoring programs. The MHTO

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<sup>167</sup> FEIS Addendum, Volume 4, Section 3.0.

<sup>168</sup> E. Madsen (Baffinland), NIRB Final Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 285, lines 17-26, p. 286, lines 1-26, p. 287, lines 1-2.

<sup>169</sup> FEIS Addendum, Volume 4.

<sup>170</sup> QIA, Final Written Submission, January 13, 2014.

requested that Baffinland consider its input in all stages of the development and execution of monitoring programs for the ERP and the Approved Project, while the Hamlet recommended that higher level training be provided through the Nunavut Arctic College in the community in order for it to be prepared to respond to the project and monitoring needs.

In its final written submission to the Board, the Hamlet of Pond Inlet also voiced concerns regarding the potential for school dropout rates to increase as a result of students leaving formal education to pursue employment associated with the ERP (either directly through employment with Baffinland or indirectly as positions that may become available with other firms providing goods or services to the Mary River Project) and recommended revisions to condition 136 and 137 to include working with the Nunavut Arctic College to support and encourage diploma programs. The Hamlet of Pond Inlet also recommended revising condition 140 to require that Baffinland have concrete plans to ensure the Hamlet does not lose staff for municipal services.

A member of Pond Inlet's youth provided testimony during the Community Roundtable at the ERP Public Hearing based on discussions with students from Pond Inlet:

*... youth are dropping out of high school and Arctic College to work at the mine. The youth recommend that there be a minimum requirement to be able to work at the mine site, a high school diploma or equivalent. There are five confirmed high school dropouts and two Arctic College dropouts...*<sup>171</sup>

### **5.2.3 Views of the Board**

The Board concluded that the FEIS Addendum provided insufficient information regarding specific training program strategies to account for the significant amount of training that would be required to employ LSA community members for the ERP and the Approved Project. Given the fact that 58 % of the North Baffin population is under the age of 25, and most possess limited training and skills, it is anticipated that they might encounter challenges attempting to obtain employment affiliated with the ERP straight out of high school.<sup>172</sup> In addition, as mentioned earlier in this report, the Board does not feel that the Proponent provided adequate consideration of training strategies required to assist unskilled labourers employed during the short construction phase required for the ERP to transition into positions during ERP operations.

As noted by the Hamlet, the Board echoes the concern that young people may leave formal education to take employment with Baffinland. The Board suggests that the bodies responsible for education and training within the territory continue to work with the Proponent, where possible, to encourage completion of programs and to provide opportunities for Nunavummiut to pursue training and education opportunities.

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<sup>171</sup> T. Soucie (Pond Inlet Youth Representative), NIRB Final Hearing File No.: 08MN053, January 29, 2014, p. 682, lines 16-26, p. 683, lines 1-2.

<sup>172</sup> FEIS Addendum, Volume 4, Section 6.4.1 and 6.7.

The Board notes the Proponent's response to the Hamlet of Pond Inlet's request to revise conditions 136 and 137 which indicated that it has partnered with the Nunavut Arctic College, and agrees that the existing wording is adequate and requires no revision.

The Board also considers the issue raised by the Hamlet with respect to the potential loss of skilled employees to private interests to be of importance – in this case, skilled employees may shift to work with Baffinland, potentially to leave a gap in the available labour pool to fill jobs within hamlet centres. However, as noted by Baffinland within its January 31, 2014 submission in respect to conditions of the Mary River Project Certificate, the Board does not believe that Baffinland would be able to prevent or restrict hamlet staff from applying for jobs with Baffinland. The Board feels that the current wording of condition 140 is adequate to monitor the movement of employees, and suggests that perhaps the Government of Nunavut or other training organizations may be better suited to increase efforts for education and training which may be needed to address the potential increase in demand for skilled municipal employees.

## **5.2.4 Conclusions and Recommendations of the Board**

Terms and conditions 135 through 141 of the existing Project Certificate address Education and Training.

The following existing terms and conditions require no changes: 135, 136, 137, 138, 139, 140 and 141.

The Board has not identified any new terms or conditions that should be added to this section.

## **5.3 Livelihood and Employment**

### **5.3.1 Views of the Proponent**

Baffinland concluded within its Final Environmental Impact Statement (FEIS) Addendum that the proposed Early Revenue Phase (ERP) would have implications for the overall labour demand profile of the Project. Compared to the Approved Project, it noted that the ERP would have a slower ramp-up in labour demand during the construction phase but that even during ERP construction the level of demand for labour would be expected to exceed the capacity of the local labour force supply. As the construction phase winds down, demand for unskilled labour would decline below the local labour force supply capacity. This scenario is similar to that predicted in the assessment of the Approved Project. For these reasons, although the ERP would have somewhat different quantitative effects on labour demand and the timing of this overall demand, the implications for the local labour force were not changed from the assessment as presented within the FEIS submitted for the Approved Project.<sup>173</sup>

The FEIS Addendum noted potential changes to the "Boom and Bust Effects" from those predicted in the FEIS for the Approved Project if a delay were to occur in the commencement of the approved Mary River

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<sup>173</sup> FEIS Addendum, Volume 4, Section 4.0.

Project construction phase following the completion of ERP construction. The FEIS Addendum outlined two potential scenarios for the ERP Proposal, with the first scenario describing a smooth transition from the ERP construction phase to the longer construction period required for the approved Mary River Project; while the second scenario described a delay in the commencement of the construction for the Approved Project with ERP ore production at 3.5 million tonnes per annum (Mt/a) being prolonged. The Proponent further noted the potential for the “bust” effect to occur with the second scenario, as many unskilled ERP construction labourers could be laid off if the Approved Project construction period were not to occur immediately following the completion of ERP construction and workers were thus unable to obtain the requisite training to continue working during ERP operations.<sup>174</sup>

The FEIS Addendum considered a labour demand assessment based on the assumption that the larger Approved Project (Certificate No.: 005) would commence in 2015. However, at the public hearing for the ERP Proposal, Baffinland stated that given the current economic conditions, initiation of construction for the larger Approved Project could be deferred to later than 2015.<sup>175</sup>

### **5.3.2 Views and Concerns of Interested Parties**

In its final written submission to the Board, the Qikiqtani Inuit Association (QIA) noted its concern that the ERP would represent a significant decrease in opportunities for Inuit as there is no guarantee that the Approved Project would commence in 2015. If a delay in the start of the approved Mary River Project construction phase were to occur, the QIA argued that a large number of unskilled local labourers would face decreased employment opportunities as the ERP operations phase would require workers with a different skill set.<sup>176</sup>

During the public hearing for the ERP Proposal, the Government of Nunavut (GN) also noted concern with respect to the decline in labour requirements associated with the shift from the scenario of exclusive ERP construction to operations (i.e., the “boom and bust effect”).<sup>177</sup>

As noted in the preceding section, the Hamlet of Pond Inlet expressed concern within its final written submission and at the public hearing regarding competition for Hamlet service employees (*e.g.*, water and sewage truck drivers and heavy equipment operators) and recommended that Baffinland have a plan in place to ensure Hamlet employees are not lost to employment at the mine leaving insufficient Hamlet staff to provide municipal services.<sup>178</sup> The Hamlet of Pond Inlet raised a similar concern during the Board’s Review of the Approved Project as well.

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<sup>174</sup> FEIS Addendum, Volume 4, Section 4.6.3.

<sup>175</sup> E. Madsen, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 48, lines 10-15.

<sup>176</sup> QIA, Final Written Submission, January 13, 2014.

<sup>177</sup> R. KatsakGN), NIRB Final Hearing File No.: 08MN053 Transcript, January 28, 2014, p. 379, lines 23-26 and p.380, lines 1-9 and GN, Final Written Submission, January 14, 2014.

<sup>178</sup> A. Kublu, Hamlet of Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, January 30, 2014, p. 268, lines 24-26 and p. 269, lines 1-7.



Elizabeth Inuarak of Pond Inlet submitted a letter to the Board which outlined the scarcity of employment opportunities in Pond Inlet, noting that the community suffers from high rates of unemployment. Ms. Inuarak advised the NIRB that the positive impact that the Approved Project has already had in the community is visible, stating:

*Why would we go against Baffinland? They are our opportunity for our youth*<sup>179</sup>

Similarly, Valerie Curley of Hall Beach expressed positive feedback during the hearing regarding the employment opportunities already realized by the Mary River Project, and noting the positive benefits:

*I'm very thankful that the youth in our communities are finding employment at the Mary River site, some a little bit older are working there, and I'm very, very thankful that they have been able to find employment at Mary River, and there's very few jobs, not only in our community but elsewhere. There have been people who have had a harsh life. Some go without food, some without jobs, and this mine is going to -- has -- has already shown positive outcomes for our communities and for our youth, and that's the first thing that I wanted to thank Baffinland for from the bottom of my heart.*

### 5.3.3 Views of the Board

The Board recognizes that the ERP may result in a number of employment opportunities for residents of the North Baffin and the other regions of Nunavut. As noted by Ms. Inuarak and Ms. Curley, the Board recognizes the positive benefits that opportunities at Mary River may have on the livelihood and employment of Inuit and Nunavummiut.

It is the Board's finding however, that Baffinland's effects assessment did not adequately account for the potential impact of the "boom and bust effect" associated with the shift in labour demand from ERP construction to operations, and notes that additional focus should be placed upon the establishment of training programs to encourage career advancement which would help to avoid a larger employment "bust effect" if the Approved Project construction phase were to be significantly delayed.

Additionally, the Board finds that the Proponent's analysis of the potential sourcing of Inuit versus non-Inuit labour required for the Project from communities in the North Baffin region, from other regions of Nunavut, other jurisdictions in Canada, and potentially from foreign countries was deficient. In the Board's view, reporting on the procurement of labour is necessary to gauge the actual gap between the available labour pool in Nunavut (including non-point of hire communities and the two other Nunavut regions) and what is required to implement the ERP for the Mary River Project. The Board is troubled that the FEIS Addendum and the Proponent's Labour Market Analysis failed to identify Inuit and non-Inuit living in Nunavut outside of the LSA as potential sources of employment for the ERP.<sup>180</sup> The Board

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<sup>179</sup> E. Inuarak, Final Written Submission, January 13, 2014.

<sup>180</sup> E. Madsen, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2013, p. 287, lines 4-14; and Baffinland, Labour Market Analysis, January 2014, Section 3.5, p. 15.

considers it essential that this information be evaluated prior to the commencement of the ERP to ensure Nunavummiut are able to fully benefit from the development of the Mary River Project and more specifically, the ERP.

As also noted in the preceding section of this report related to training and education, the Board recommends that the Proponent work closely with local hamlet offices, the GN and training organizations such as the Municipal Training Organization to develop strategies which may help to address the need for adequately trained employees by both private and public sector employers. The Board recognizes that this issue and associated impacts are more broad than the Mary River Project and ERP alone, however it believes that the potential for the development of Mary River and the ERP facilities to attract skilled workers away from employment with hamlet services is a real possibility and therefore encourages all parties to work together toward the common goal of increasing the capacity of the labour pool within the LSA.

The Board further believes that the Proponent will be required to work closely with the local hamlet offices to develop strategies to ensure that municipal workers do not abandon their positions with hamlets to seek employment at the ERP Proposal.

### **5.3.4 Conclusions and Recommendations of the Board**

Terms and conditions 142 through 147 of the existing Project Certificate address Livelihood and Employment.

The following existing terms and conditions require no changes and should be applied to the ERP: 142, 143, 144, 145, 146 and 147.

Term and condition 139 of the Population Demographics section of the existing Project Certificate applies to the ERP and should be amended:

**Condition 139:** amend wording to require an updated Labour Market Analysis which considers requirements of ERP as well as hiring points within Nunavut and outside of the North Baffin region and RSA.

The Board has not identified any new terms or conditions that should be added to this section.

## **5.4 Economic Development and Self-Reliance, and Contracting and Business Opportunities**

### **5.4.1 Views of the Proponent**

The Final Environmental Impact Statement (FEIS) Addendum identified the relative importance of tourism as a component of the Economic Development and Self-Reliance Valued Socio-economic Component (VSEC) where “wilderness experience” was not directly identified as a valued-component in

and of itself, but was considered to potentially contribute to tourists' choices and therefore indirectly to tourism levels in the region. Land-use activities associated with the Early Revenue Phase (ERP)—particularly activities located at Milne Inlet and along the northern shipping route—were found to have the potential to disrupt the “wilderness experience” of some tourists. Baffinland further noted that the best available baseline information suggested that the frequency of such interactions would be low, given the small eco-tourism sector in the region.<sup>181</sup>

The Proponent indicated that travellers around Eclipse Sound and Pond Inlet could be negatively affected by ERP activities when boaters share the water with ore carriers or other project vessels, but this boater/vessel effect was determined to be of low magnitude and intermittent in frequency as ore carriers would only ship out of Milne Port during the open water season. Based on low magnitude and intermittent frequency ratings, Baffinland's FEIS Addendum concluded that the effect on safe travel around Eclipse Sound and Pond Inlet would not be significant. Potential noise disruptions would occur in the Milne Inlet region and could be periodically audible at nearby camps; however it was concluded that the noise and air emissions would be within normal thresholds as defined in the noise and air quality impact assessments. Based on the low magnitude and continuous frequency of the Project's effect on noise and air emissions at the traditional camping area at Milne Inlet, the effect of the ERP was determined to be not significant.<sup>182</sup>

## 5.4.2 Views and Concerns of Interested Parties

In regards to economic development, the Government of Nunavut's (GN) final written submission recommended that the potential drop in employment between the construction and production phases of ERP activities be included in the risk analysis of temporary mine closure provided for within existing term and condition 149. During the public hearing, the GN reported that it had reached a resolution with Baffinland regarding the revision of term and condition 149 to include the decline in employment associated with the shift from construction to operation during the ERP in the Proponent's analysis of the risk of temporary mine closure.<sup>183</sup>

Also during the hearing, the GN informed the Board of changes to its public housing rent scale system which it noted were to come into effect in February 2014 and which may assist residents obtaining new employment by defining the maximum rental increases at 25% in any given year, noting that:

*It is supposed to be much easier for people who are starting to find new employment, and so they don't see such sharp increases in their rent.*<sup>184</sup>

Parks Canada's (PC) final written submission to the Board detailed a number of potential impacts from the proposed ERP for the Mary River Project on visitor experience in the Sirmilik National Park. These

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<sup>181</sup> FEIS Addendum, Volume 4, Section 5.5.

<sup>182</sup> FEIS Addendum, Volume 4, Section 10.5.2.

<sup>183</sup> R. Katsak, GN, NIRB Public Hearing, File No.: 08MN053 Transcript, January 28, 2014, p. 379-380 lines 26 and 1-7.

<sup>184</sup> L. Kamermans (GN), NIRB Public Hearing, File No.: 08MN053 Transcript, January 30, 2014, p. 811, lines 1-26, p. 812, line 1.

project activities included sight and noise intrusion from aircraft transporting workers and supplies to the Project, sight and physical intrusions (waves and collision hazards) from ships traversing the same waters as kayakers or other small boats, as well as the potential indirect effect of the Project on marine mammals which are in themselves, a major attractions for visitors in to the Park. Parks Canada concluded that these project activities have the potential to adversely affect the wilderness experience for park visitors.

Parks Canada indicated that the most notable areas of potential interaction between the ERP and visitor interaction would be in the Oliver Sound and Paquette Bay regions of the park. These regions are under the Project's flight paths and are areas of high visitor and local community use. Parks Canada also determined that there would also be the potential for kayakers in the Borden Peninsula and Oliver Sound park areas and Milne Inlet areas to have their wilderness experience interrupted by Project vessels exists, as well as the potentially to encountering public safety issues from ship collisions or interaction with ship wakes. In addition, Parks Canada stated that any potential impacts to the marine habitat and marine mammals in the region from ERP Project-related shipping activities (e.g., ship strikes, impacts from ballast water and potential introduction of invasive species, adverse effects from shipping on seabirds, etc.) would impact the overall visitor experience to the park. In its final written submission, Parks Canada recommended revised wording for Project Certificate term and condition 150 to require that the Proponent advise of its shipping schedules on a daily basis as needed and of air traffic information on an annual basis, and to provide updates as required. Baffinland countered this suggestion to amend the requirement for daily communications to providing anticipated schedules on an annual basis and to provide updates when significant variations from these were expected.

The Hamlet of Pond Inlet indicated within its final written submission that in order for people in Pond Inlet to take advantage of potential business opportunities created by the ERP, assistance would be required from other parties such as Baffinland, the QIA, and the GN to support entrepreneur and business training programs which would help the business community acquire necessary skills. One instance of the potential for business opportunities within communities was evidenced by a representative from Hall Beach who noted during the hearing that the limited availability of reliable transportation, and specifically taxi services, to and from the airport is a limiting factor for people not showing up for flights to work sites:

*The people that are working, couples who have -- or either of the spouses are working at Mary River, sometimes it's very difficult for them to find a way to get to the airport because of the lack of transportation for them. It's not because they're AWOLing (sic). It's not that it's a joke to them. It's a fact that there is no transportation for them. There are a few vehicles in our communities, but they are all government vehicles, and they aren't used for -- for -- to transport local people around. There are also very few people who own their own vehicles, but it's very -- we don't want to infringe ourselves and say, Can you give me a ride or give me a ride to the airport or back into town? And this has to be an issue that has to be resolved. It's not only in my community. It's like that in other -- it's probably like that in the other communities too. There's no taxi in our community. There is no taxi*

*service in our community, and that's one of the main reasons why people have problems getting to the airport. So that should be well understood by the company.*<sup>185</sup>

Ms. Curley also identified the importance of training for employees which is specific to improving individual self-reliance:

*People that will be going to work at the mine site, they have -- they will be trained. They have to be trained how to -- to -- to live well and how to spend their money wisely.*<sup>186</sup>

### 5.4.3 Views of the Board

The Board notes that the ERP Proposal, while reduced in scale from the Approved Project, is still expected to provide significant economic benefits to the local, regional and territorial economy in terms of economic development and self-reliance, and contracting and business opportunities.

The Board acknowledges that the GN's amendment to the public housing rent scale system may benefit some employees at the Mary River Project living in public housing. This will be of particular relevance for people living in public housing hoping to obtain employment associated with the ERP as they may not experience as dramatic an increase in their public housing rental rates related to increased income levels. As the GN was unable to provide additional details regarding the implementation of the new rent scales during the public hearing, and recognizing that the new system may encourage residents currently living in public housing to seek employment with Baffinland, the Board feels it would be helpful for members of the public to be oriented to the changes to the rental rate system, and encourages the GN to facilitate the exchange of information regarding the changes with residents of Iqaluit and the North Baffin communities potentially affected by employment throughout the ERP.

The Board recognizes the Proponent's commitment to address the issues raised by Parks Canada regarding impacts to park visitors and local users and encourages the Proponent to work with Parks Canada to develop strategies to advise park visitors and local community users to Project-related activities occurring in the region.<sup>187</sup>

As raised by members of the public and the Hamlet of Pond Inlet at the public hearing, the Board acknowledges the concerns raised regarding the ability of Inuit owned and smaller businesses to fully

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<sup>185</sup> V. Curley (Community Representative- Hall Beach), NIRB Public Hearing, File No.: 08MN053 Transcript, January 29, 2014, p. 673-644, lines 7-26; 1-3.

<sup>186</sup> V. Curley (Community Representative- Hall Beach), NIRB Public Hearing, File No.: 08MN053 Transcript, January 29, 2014, p. 674, lines 8-11.

<sup>187</sup> Baffinland, Exhibit 3, NIRB Public Hearing, File No.: 08MN053.

take advantage of the opportunities arising from the ERP.<sup>188</sup> The Proponent and relevant agencies, including the QIA, GN, Municipal Training Organization, the hamlets and others are encouraged to work together to ensure that entrepreneurs and small businesses are aware of the requirements for contract procurement, and if possible, have access to relevant training and/or business development programs which may be available, and the opportunities which may arise either directly or indirectly as a result of the ERP moving forward.

#### **5.4.4 Conclusions and Recommendations of the Board**

Terms and Conditions 148 through 152 of the existing Project Certificate address Economic Development and Self-Reliance, and Contracting and Business Opportunities.

The following existing Terms and Conditions require no changes but should be applied to the ERP: 148, 151 and 152.

The following existing Terms and Conditions require minor revision and should be applied to the ERP: 149 and 150.

The Board has not identified any new terms or conditions that should be added to this section.

### **5.5 Human Health and Well-being**

#### **5.5.1 Views of the Proponent**

Baffinland's Final Environmental Impact Statement (FEIS) Addendum assessed the potential impacts of the Early Revenue Phase (ERP) with respect to human health, including the well-being of children, substance abuse, and community social stability.

The FEIS Addendum concluded that the addition of ERP components would not change Project interactions with the Human Health and Well-Being Valued Socio-economic Component (VSEC). This was based partially upon the finding that as the level of local employment would not change owing to the pre-existing and persisting fact that labour demand would exceed local supply, there would be no substantial change in income earned from the Project or in the rate of absenteeism from families and communities due to fly-in/fly-out rotations. It was determined that there were no significant impacts on marine or terrestrial wildlife in the FEIS Addendum and as such, that the ERP would also have no

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<sup>188</sup> G. Alikut, NIRB Member, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2013, p. 291, lines 9-15 and G. McLean, NIRB Member, NIRB Public Hearing File No.: 08MN053 Transcript, January 30, 2014, p. 812, lines 7-26 and p.813, lines 1-3.

significant impact on human food security. A minor change was made in the FEIS Addendum to include reference to dust deposition at the Milne Inlet camp but this did not change Baffinland's effects assessment conclusions from the Approved Project.

At the public hearing, Baffinland noted specific mitigation measures which may be applied in certain situations to minimize dust along the Milne Inlet Tote Road including speed limit enforcement, covering of truck trailers, use of larger aggregate on the road and the application of dust suppressants, where needed.<sup>189</sup>

## 5.5.2 Views and Concerns of Interested Parties

Both the Qikiqtani Inuit Association (QIA) and the Hamlet of Pond Inlet expressed uncertainties regarding the accuracy of Baffinland's dust modelling results in the FEIS Addendum. The Hamlet was concerned about the potential impact of the accumulation of dust on vegetation and in creeks which could then affect caribou and other terrestrial animals and spawning of arctic char, which in turn could potentially impact human health from the harvesting of these resources.<sup>190</sup> The QIA in their final written submission to the Board recommended that Baffinland revisit its dust dispersal modelling to reduce any uncertainties and further inform the monitoring program.<sup>191</sup>

The Government of Nunavut (GN) also expressed concern during the hearing regarding the potential for project-related activities, particularly shipping, to impact marine mammal distribution and therefore local hunters' ability to harvest marine wildlife, as well as the potential negative effect this could have on food security in the region.<sup>192</sup>

Pond Inlet resident and Youth Coordinator, Tim Soucie, also provided testimony during the hearing expressing concern for the potential increased substance abuse among local residents which may be related to their employment at the Mary River project and noting their fear that with the approval of the ERP these issues could be further exacerbated:

*More jobs mean more drugs and alcohol. The youth see it. And the discussion with the RCMP proves that there are more related drunken-related calls since the approved Mary River Project mine opened up.*<sup>193</sup>

A community representative from Hall Beach, Valerie Curley, also noted the importance of ensuring that Baffinland's employees are given the tools and support needed to maintain healthy lifestyles and to improve well-being while employed at the Project:

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<sup>189</sup> O. Curran (Baffinland), NIRB Final Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 178, lines 14-19 and p. 235, lines 13-21.

<sup>190</sup> Hamlet of Pond Inlet, Final Written Submission, January 13, 2014.

<sup>191</sup> Hamlet of Pond Inlet, Final Written Submission, January 13, 2014 and QIA, Final Written Submission, January 15, 2014.

<sup>192</sup> R. Katsak, GN, NIRB Public Hearing, File No.: 08MN053 Transcript, January 28, 2014, p. 378, lines 13-19.

<sup>193</sup> T. Soucie, Pond Inlet, NIRB Public Hearing File No.: 08MN053 Transcript, January 29, 2014, p. 683, lines 2-6.

*There should be other ways on how to improve the well-being of Inuit. There should be some -- someone who works as a social worker or someone who is a mentor or someone who can help the people along to live a better lifestyle, whether -- there should be one that's male and the other one should be female who hold these two positions. It will be difficult for some of the younger people who work there and are away from home because the young people are young, and they -- they tend to have a lot of things on their minds, like worrying.<sup>194</sup>*

### 5.5.3 Views of the Board

While the Board recognizes the Proponent's stated intention to have an Inuit Elder employed and on-site at all times to act as a counsellor and mentor to Inuit employees<sup>195</sup> and agrees that this would contribute positively to the well-being of Inuit employees on-site, the Board feels that a qualified mental health professional may also provide additional types of counsel to these employees at site, as well as to the families and friends of employees in their home communities.

The Board acknowledges Baffinland's plan to offer an employee and family assistance program and feels that additionally, access for employees and families to a qualified mental health professional would provide needed support to both the Project employee and his/her family. The Board's concern for families of Baffinland employees was also echoed by the Hamlet of Pond Inlet at the hearing:

*The long-term employees who spend two weeks in, two weeks out, their spouses (wives and husbands), who are left behind at home are affected too. They have hardships with their children... How can these families be further supported, other than by the QIA?<sup>196</sup>*

The Board has concerns regarding the potential impacts to human health and the well-being of Local Study Area (LSA) residents from such issues as substance abuse, family violence and gambling that may result from increased disposable income earned associated with the ERP for the Mary River Project.

The Board also recognizes the GN's concerns regarding the potential impact of ERP-related shipping activities on marine mammal distributions which could result in effects to food security in the region. Adaptive management will play an important role in determining if Baffinland's predicted effects as presented within the FEIS Addendum are accurate and there are no significant impacts to marine mammals from ERP activities, or if it is found that project-related activities are impacting marine mammals and that additional mitigative measures are necessary to prevent adverse effects to food security and LSA residents as a result.

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<sup>194</sup> V. Culey (Hall Beach), NIRB Public Hearing File No.: 08MN053 Transcript, January 29 2014, p. 674, lines 12-22.

<sup>195</sup> E. Madsen (Baffinland), NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 273-274, lines 16-26; 1-9.

<sup>196</sup> A. Kublu, Pond Inlet, NIRB Public Hearing, File No.: 08MN053 Transcript, January 27, 2014, p. 270, lines 6-13.



## **5.5.4 Conclusions and Recommendations of the Board**

The Board recognizes the Proponent's commitment to providing adequate medical services on site, and further recommends the following:

1. The Proponent is encouraged to employ a qualified mental health professional to provide counseling to Inuit and non-Inuit employees in order to positively contribute toward employee health and well-being.
2. The Proponent is encouraged to extend access to a qualified mental health professional to the families of employees that are experiencing significant changes to their homelife associated with a family member's employment at the ERP.

Terms and Conditions 153 through 157 of the existing Project Certificate address Human Health and Well-Being.

The following existing terms and conditions require no changes but should be applied to the ERP: 153-157.

The Board has not identified any new terms or conditions that should be added to this section.

## **5.6 Culture, Resources and Land Use**

### **5.6.1 Views of the Proponent**

The Final Environmental Impact Statement (FEIS) Addendum concluded that the changes made to the effects assessment for culture, resources and land use for the Early Revenue Phase (ERP) are limited to Project interactions that occur at Milne Port, along the Milne Inlet Tote Road and along the northern shipping route. Baffinland indicated that the significance determination for the ERP has not changed from that presented within the FEIS for the approved Mary River project for any of the key indicators of Culture, Resources and Land Use.

Baffinland's FEIS Addendum indicated that Project-related shipping through Eclipse Sound and past Pond Inlet to Milne Inlet was not expected to meaningfully affect use of marine areas by hunters in boats as project ore carriers and other vessels would generally stay within the middle of the waters of Eclipse Sound and adjacent to Pond Inlet, while it was expected that hunters would remain closer to the coast. Baffinland noted that while the project vessels would not affect the ability of residents to travel through Milne Inlet and Eclipse Sound, interactions with the public would occur, and that considerations for public safety would be important. Its FEIS Addendum indicated that potential impacts to public

safety would be mitigated by promoting community public safety awareness, informing the community of vessel movements, potentially tracking the routing and timing of ship passages and by holding periodic public meetings and information sessions.<sup>197</sup> Effects to boaters and vessels were determined to be of low magnitude and intermittent in frequency as ore carriers would only be transiting along the northern shipping route during the open water season. As a result, Baffinland indicated that the ERP would not have a significant impact on safe travel for hunters around Eclipse Sound and Pond Inlet.

## 5.6.2 Views and Concerns of Interested Parties

The Government of Nunavut (GN) noted within its final written submission that systematic archaeological surveys should be implemented for the ERP when deviation from the original project footprint occurs:

*For potential impacts along Milne Inlet, shovel testing is specifically requested and should be included. Another provision should be added for the upgrading of mitigation measures already used to protect heritage resources close to the current temporary road. The upgrades should be commensurate with the activity required and impacts of permanent, heavily used infrastructure.*<sup>198</sup>

The Construction Environmental Protection Plan provided within Baffinland's FEIS Addendum addresses the potential for encountering 'undiscovered cultural heritage or archaeological resources' during ERP construction activities.<sup>199</sup> Baffinland indicated during the public hearing that detailed mitigation plans for cultural resources were included within its Cultural and Heritage Resources Protection Plan and Construction Environmental Protection Plan and further committed to working together with the GN's Department of Culture and Heritage in planning mitigations related to construction work in 2014.<sup>200</sup>

Aboriginal Affairs and Northern Development Canada (AANDC) noted within its final written submission to the Board that during the NIRB community consultation sessions conducted in October 2013, the principle cause for concern was the potential impact of shipping on the marine environment, in particular on marine mammal populations.<sup>201</sup>

The Qikiqtani Inuit Association (QIA) expressed concern during the hearing with regard to Inuit employees' right to harvest and Baffinland's policy at Mary River to prohibit employees from possessing firearms or conducting harvesting activities on site during their time off:

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<sup>197</sup> FEIS Addendum, Volume 4, Section 5.5.

<sup>198</sup> GN, Final Written Submission, January 14, 2014.

<sup>199</sup> FEIS Addendum, Construction Environmental Protection Plan, June 2013.

<sup>200</sup> E. Madsen, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 250, lines 19-26, p. 251, lines 1-4.

<sup>201</sup> AANDC, Final Written Submission, January 14, 2014.

*Based on Baffinland's desire to properly implement NIRB's Project Certificate, specific to conditions 64 and 124, Baffinland has developed a no hunting policy for project employees on their site, and QIA views this policy as a prohibition against rights contained within the IIBA, as well as rights contained in the NLCA, the rights of Inuit to be afforded the opportunity to harvest during leisure hours is contained in both of these documents.*

Baffinland provided clarification during the hearing in respect of its policies surrounding the issue of employees conducting harvesting activities during their leisure hours at Mary River and associated ERP project sites:

*... we have to follow the Nunavut Mines Safety Act regulations... there are clauses in there that require workers to have 12 hours' rest between their shifts. And anybody who's worked at a mine site knows you're working 12 hours a day, you're there for two weeks...it becomes long days, and we require our workers to be fit for work the next day, and, also, the mines inspector that regulates our mine makes it very clear that we need our workers to get rest to be fit to drive those sizes of trucks...so it is a requirement of the Mine Safety Act that we follow that. So all of those things have to be taken into consideration when we talk about leisure time after hours.<sup>202</sup>*

The Mittimatalik Hunters and Trappers Organization (MHTO) noted within its final written submission that it is committed to actively participate in the debate surrounding Inuit access to harvesting areas in the vicinity of the proposed ERP Proposal area, and also stated that hunting and being out on the land or water is central to the well-being of hunters and community members. The MHTO indicated its position that Baffinland has a responsibility to respect that need, and that it also has a role in supporting access to the land for its employees. The MHTO urged Baffinland to consider making hunting equipment accessible for its staff, and noted its desire for Baffinland to assist hunters that are encountering gasoline shortages from having to travel longer and route around the Project area in order to access their hunting grounds.

The Hamlet of Pond Inlet noted within its final written submission that the northern shipping route associated with the ERP is too close to Savik on the western side of Milne Inlet and that this routing would have great potential to disrupt an important harvesting and camping area for Inuit. The Hamlet of Pond Inlet proposed that the shipping route be moved closer to the eastern side of the entrance to Milne Inlet. It further indicated that the number of ship transits associated with the ERP Proposal combined with the size and speed of such ships would create ship wakes that could be harmful to the land (erosion), animals (shorebirds nesting and other species) and to Inuit subsistence hunting. The Hamlet of Pond Inlet recommended that monitoring of erosion be conducted along the northern shipping route, including at Milne Inlet, Eclipse Sound and the coastline at the entrance to Baffin Bay.<sup>203</sup>

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<sup>202</sup> E. Madsen, Baffinland, Public Hearing NIRB File No.: 08MN053 Transcript, January 29, 2014, p. 616, lines 14-126, p. 617, lines 1-5.

<sup>203</sup> Hamlet of Pond Inlet, Final Written Submission, January 13, 2014.

A community representative from Pond Inlet suggested during the public hearing that Baffinland consider the establishment of a warning system (sound or lighthouse) in Milne Inlet to warn people of ships transiting through Milne Inlet since many families camp and harvest in the area during the summer and the weather can often become very foggy.<sup>204</sup>

### **5.6.3 Views of the Board**

The Board feels that early, ongoing, and consistent consultation with affected communities is necessary to ensure that the Proponent's mitigative measures are successful where these measures are designed to mitigate impacts to land users, and are especially important in educating the affected populations with respect to safety on the land and water. The Board appreciates the views as presented by members of the public during the hearing, and feels that consultation following project authorization is essential to the successful development of the Mary River Project, especially in regards to working with the local HTOs and LSA community members which could contribute important Inuit Quajimaningit perspectives for interpreting monitoring program data results.

As noted in preceding sections of this report, the Board feels that the Proponent's analysis of potential impacts to wildlife resulting from project interactions is lacking owing to current data gaps for wildlife populations such as caribou and marine mammals. As such, the Board feels a precautionary approach should be taken wherever such interactions have the potential to adversely impact upon the traditional harvesting or other cultural pursuits of Inuit, and further, that adaptive management will play an important role in implementing additional mitigative actions where monitoring data indicates adverse impacts may be occurring due to Project interactions.

The Board recognizes that the Nuanvut Land Claims Agreement (NLCA) provides Inuit with the right to harvest in Nunavut generally, and that these rights also exist within ERP Proposal areas. The Board is of the opinion that when viewed in proper context with the full appreciation of the rights and obligations under the NLCA and recognizing that the Minister of Aboriginal Affairs and Northern Development approved both the issuance of the Project Certificate terms and conditions and ratification of the Inuit Impact and Benefit Agreement, that the terms in both documents can be read together without conflict.<sup>205</sup> It is for this reason that the Board will not be implementing the MHTO's suggested amendments to Conditions 64 and 124 for the ERP. Additional discussion surrounding the issue of Inuit harvesting can be found in Section 1.9 of this report.

The Board agrees with those North Baffin residents and organizations who impressed the importance of being kept informed on a regular basis as to the northern shipping route and ship transit schedules.

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<sup>204</sup> J. Atagutak, Pond Inlet, NIRB Public Hearing, File No.: 08MN053 Transcript, January 29, 2014, p. 654, lines 1-19.

<sup>205</sup> The Board recognizes that the Board's views on this issue are not determinative, as the Minister is the ultimate decision-maker with respect to the appropriateness of specific terms and conditions in a Project Certificate in any given case.

The Board also recognizes the Proponent's commitment to work with the GN Department of Culture and Heritage, and recommends that it update the Construction Environmental Protection Plan to include the GN's recommendations regarding ERP activities outside of the original project footprint, particularly in Milne Inlet and along the Milne Inlet Tote Road.

## **5.6.4 Conclusions and Recommendations of the Board**

Terms and Conditions 162 through 166 of the existing Project Certificate address Culture, Resources and Land Use.

The following existing terms and conditions require no changes but should be applied to the ERP: 162, 163, 165, 166, 167.

The following existing terms and conditions require minor revision and should be applied to the ERP: 164

**Condition 164:** amend wording to clarify that in addition to the information required to be provided to communities in the RSA on a monthly basis, the Proponent is required to provide information on scheduled ship transits throughout Eclipse Sound and Milne Inlet, real-time data regarding ships in transit and any changes to proposed shipping schedule or routing, to the MEWG and agencies within Pond Inlet on a weekly basis during open water shipping, and to the communities of the RSA on a monthly basis.

The Board has not identified any new terms or conditions that should be added to this section.

## **6. OTHER MATTERS TAKEN INTO ACCOUNT**

### **6.1 Accidents and Malfunctions**

#### **6.1.1 Views of the Proponent**

As outlined in Volume 9 of Baffinland's Final Environmental Impact Statement Addendum (FEIS Addendum), on the basis of public concern, the experience and direction of project personnel and a review of comparative projects, a list of "credible" accidents and malfunctions with a reasonable probability of occurring were assessed for the purposes of both the Approved Project and the Early Revenue Phase proposal. Baffinland indicated that in addition to the scenarios as previously assessed under the Approved Project and outlined in Table 9.3.4 of the FEIS Addendum, Volume 9, that additional scenarios with respect to ore carrier movements and increased truck traffic were added to reflect the activities under the Early Revenue Phase proposal. Baffinland concluded that the risks and likelihood of accidents and malfunctions as assessed in the Approved Project remained unchanged in light of the Early Revenue Phase proposal.

In the FEIS Addendum, Baffinland referenced that the approach to accident and malfunction prevention and preparedness for the Early Revenue Phase Proposal remained unchanged from the Approved Project, and continues to be based on ensuring compliance with relevant regulatory requirements, incorporating preventative measures into project planning and design stages, implementing effective management plans and maintaining well-trained emergency response teams.<sup>206</sup>

The FEIS Addendum also provided information that supported the hazard assessments and impact predictions in the FEIS for the Approved Project, resulting from a shipping risk assessment workshop convened by Baffinland in June 2012, after the FEIS for the Approved Project had been submitted to the Board. The stated purpose of the workshop was to further consider possible risks, hazards and preventative measures to address accidents and malfunctions along the shipping route through Hudson Strait and Foxe Basin. Representatives from Transport Canada, the Canadian Coast Guard, the Qikiqtani Inuit Association, Fisheries and Oceans Canada and Environment Canada attended the workshop, as well as representatives of two shipping companies - Fednav and PetroNav. The minutes from this workshop were provided by Baffinland in the FEIS Addendum, Volume 9, Appendix 9B.

The key spill prevention measures identified during the workshop and to which Baffinland ascribes included: the recognition that the Ship Master is responsible for the safe navigation of vessels, regardless of whether the cargo is fuel or iron ore; the Transport Canada requirements that all tankers

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<sup>206</sup> See FEIS Addendum, Vol. 1, Section 7 at p. 77.

constructed after 1993 are required to be double-hulled in order to operate in Canadian waters; the recognition that vessels have anti-collision devices with alarms and radar to ensure that collisions are avoided and several dual/redundant backup systems such as twin engines, radar and built in redundancy for navigational systems and communication systems; and that the bathymetry in the north shipping route (that is proposed to be used for the Early Revenue Phase proposal) is well known and the routing is well established.

In addition, the Proponent indicated that the content of complying with the “Rules of the Road” for shipping were more fully discussed at the workshop and that these included acknowledging that shipping operators must abide by the established regulatory framework; that ships must sail within a known and established shipping corridor; and that ships must have a Shipboard Oil Pollution Emergency Plan (SOPEP).

Baffinland also committed to engaging in additional preventative measures, including:

- Identifying the environmentally sensitive areas along the shipping route;<sup>207</sup>
- Shipment of bulk fuel only during the open-water season; and
- Selection of suppliers with Arctic expertise and experience for delivery of fuel.

For emergency response along the shipping route, Baffinland expressly recognized that regulatory requirements dictate that Baffinland must have response capabilities to deal with a 10,000 tonne fuel spill. At the Public Hearing, Baffinland outlined its approach to this requirement as follows:

*So in terms of emergency and spill response at sea, Baffinland is committed to be self-sufficient for emergency and spill response with a capacity to escalate the response for larger marine spills of up to 10,000 tons [sic tonnes]. This is also a regulatory requirement. Baffinland will implement a tiered response approach for marine spill response. Tier 1 rests with the ship: The ship operator is the primary responder for any incident occurring at sea in which the ship is involved. The purpose of the ship oil pollution emergency plan is to outline the sequence of action and procedures to be implemented should the ship be responsible for a spill.*

*Tier 2 rests with Baffinland's emergency response team located at Milne Port: Baffinland will have an emergency team stationed at Milne Port. The emergency response equipment will also be stationed at Milne Port and will include deployment boats, booms, skimmers, barges, and other types of necessary equipment to deal with fuel spills at sea. Baffinland will also have two or three tugboats, which will also be operating at the port and will be available to assist in emergency situations. These tugboats will enable Baffinland to respond immediately to distress calls from ore carriers, should they occur.*

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<sup>207</sup> See FEIS Addendum, Vol. 9, Appendix 9F, Milne Inlet Coastal Sensitivity Report.

*Tier 3 response involves an agreement for assistance with Oil Spill Response Limited. Oil Spill Response Limited is an industry-owned cooperative which exists to respond effectively to oil spills wherever in the world they may occur. Oil Spill Response Limited membership consists of over 160 corporations, which are mostly oil majors, national or independent oil companies and energy-related companies operating in the oil supply transportation chain. Responding to spills is their area of expertise.*<sup>208</sup>

On the basis of these preventative and response capabilities, the Proponent concluded that:

- The risk of a spill along the shipping route is low or unlikely because of the prevention measures incorporated into the Project.
- If there is an accident or malfunction associated with vessels along the shipping route, Baffinland will be prepared to intervene effectively and rapidly.
- The risk of transboundary effects associated with a fuel spill along the Early Revenue Phase shipping route is considered very unlikely (very low risk) because the shipping route is entirely within Nunavut territory.<sup>209</sup>

## **6.1.2 Views and Concerns of Interested Parties**

As noted previously in Section 4.11 of this Report, at the Public Hearing for the ERP proposal, Transport Canada (TC) advised Baffinland that they should take into consideration the remoteness and reality of operations, particularly in regard to responding to a spill and seeking outside assistance, as there are no response organizations in the Arctic. Transport Canada also provided the Board with advice regarding their suggestions for an existing term and condition directed at preventing potential harm should a spill occur while ship to shore fuel transfer is taking place. TC expressed the view that the practice of “pre-booming” is largely ineffective when extending beyond 300 metres in the following summary:

*The other element concerns comments with regard to our position on pre-booming. We do not recommend pre-booming as applied to a tanker that is providing fuel from an offshore position, so that is where the tanker is anchored, approximately 1 kilometre away. Our experience and our knowledge has found that, once you're going beyond 300 metres of boom, the effectiveness of the boom and the safety considerations to deploy it are not beneficial to actually containing any spill. Even in the Gulf of Mexico disaster where thousands of -- you may have heard of reports where thousands of metres and kilometres and miles of boom were being deployed in any one application of a boom.*

*It was -- it would be about 300 metres would be the maximum extent that the boom would be deployed, so to encircle a tanker that is located 1 kilometre*

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<sup>208</sup> F. Beaulac, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, pp. 258-260, lines 23-26, 1-26 and lines 1-5.

<sup>209</sup> FEIS Addendum, Volume 1, Section 7.4.2 at p. 84.



*offshore, you're talking 2,000 metres of boom and then some to fully encircle the tanker. And to apply this safely would, first off, be a safety challenge, and secondly, the efficacy of the boom in open water with that land would be very limited, as the boom would be subject to the wave action and the likelihood of containing anything from that boom would be extremely low.*<sup>210</sup>

The Qikiqtani Inuit Association found that the risk of fuel spills or the impacts of such a spill occurring along the shipping route for the Early Revenue Phase Proposal was not adequately assessed in the FEIS Addendum. The Qikiqtani Inuit Association recommended that Baffinland assess the risk of project-related shipping accidents noting areas along the shipping route where vessels may be particularly likely to experience a spill based on environmental conditions including the presence of sea ice.<sup>211</sup>

In its technical review comments provided in October, 2013, Environment Canada (EC) recommended that spill trajectory modelling be done through Eclipse Sound and in the vicinity of Cape Graham Moore to help inform Baffinland's spill response planning.<sup>212</sup> A major fuel spill along the northern shipping route for the Early Revenue Phase proposal was identified as posing the largest threat to marine birds with the potential to cause large and long-lasting negative effects on local marine ecosystems. Baffinland committed to ongoing discussions with Environment Canada to define additional modelling requirements that would be useful in establishing priority response. At the Public Hearing Baffinland reaffirmed a previous commitment from the November 2013 Technical Meeting for the Early Revenue Phase Proposal, confirming it will consult with the Environment Canada science table to select the areas for further spill modelling.<sup>213</sup>

As noted in Section 4.12, the Marine Wildlife and Marine Habitat section of this Report, in its final written submission to the NIRB, the Government of Nunavut outlined its concerns for potential impacts to polar bears from accidents and malfunctions associated with shipping for the Early Revenue Phase proposal.<sup>214</sup> While noting that the likelihood of a tanker running aground and creating an associated fuel spill was extremely low, the Government of Nunavut believes that such an occurrence should be taken into account by the Board and addressed through a requirement for additional baseline, monitoring and establishment of a performance bond for clean-up and remediation of such occurrences.

### **6.1.3 Views of the Board**

The Board shares the concerns of parties regarding potential shipping accidents and malfunctions which could lead to fuel spills in pristine marine areas of the North Baffin Region important for marine wildlife,

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<sup>210</sup> P. Topping, Transport Canada, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 133 at lines 1-23.

<sup>211</sup> The Qikiqtani Inuit Association, Final Written Submission, January 15, 2014, at pp. 10-14.

<sup>212</sup> Environment Canada's Technical comments regarding the Addendum to the FEIS submitted by Baffinland in support of the Early Revenue Phase Proposal (NIRB: 08MN053), October 16, 2013, at p. 26.

<sup>213</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 108, lines 5-8.

<sup>214</sup> Government of Nunavut, Final Written Submission, January 13, 2014, at pp. 10-11.

harvesting, tourism and recreation. During the Public Hearing the Board expressed concern regarding the need to ensure that the Baffinland's emergency response team at the Milne Port site are able to respond to a spill in the unpredictable conditions of high seas, high wind and other adverse conditions.<sup>215</sup> The Board also recognizes and appreciates that the focus of Baffinland's efforts in this section will continue to be on accident and malfunction prevention to reduce the likelihood of occurrences, as well as emergency preparedness to reduce the severity of effects in the event that an accident or malfunction does occur.

#### **6.1.4 Conclusions and Recommendations of the Board**

Terms and conditions 170 through 177 of the existing Project Certificate address the potential for Accidents and Malfunctions.

The following existing terms and conditions require no changes: 175.

The following existing terms and conditions require no changes but should be applied to the ERP: 170, 172 and 174.

The following existing terms and conditions require minor revision and should be applied to the ERP: 171, 173, 176 and 177.

The following existing terms and conditions require minor revision and should be applied to the ERP:

**Condition 173:** revised to reference best practices and regulatory requirements for marine based fuel transfer events.

There are no new terms and conditions to be added to the Accidents and Malfunctions section.

## **6.2 Alternatives Analysis**

### **6.2.1 Summary of Key Issues**

In the FEIS Addendum, the Proponent noted that the Early Revenue Phase Proposal was in fact an alternative means of carrying out the Approved Project, and as such, an alternative to the Early Revenue Phase Proposal is the Approved Project. Given current economic feasibility, the Early Revenue Phase Proposal has now become the preferred alternative to carry out the project, at least at the initial stages of project development:

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<sup>215</sup> P. Kadlun, NIRB, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 293 at lines 11-19.

*The analysis of Project alternatives presented in FEIS Volume 3, Section 6, remains relevant for the Approved Project. Baffinland views the ERP as a means of demonstrating the technical and economical viability of a year-round operation of a large scale mine in the Arctic. The ERP will enable the Company to generate consumer interest and revenue from the exploitation of Deposit No.1, which in turn will enable the Company to secure financing and proceed with the development of the Approved Project.*<sup>216</sup>

As emphasized by the Proponent at the Public Hearing:

*Unfortunately, this rail project [the Approved Project] is capital intensive. The estimated capital investment will exceed \$5 billion. With the fallout of the recent financial crisis and the prolonged economic downturn in many regions of the world, the market demand for iron is weaker than forecasted, and the investment climate for large capital projects has changed dramatically.*

*For many corporations, the focus is now on debt reduction, rather than moving forward with large capital investments. Funding of large capital projects around the world is now very challenging, and one cannot predict how long this climate of uncertainty will last.*

*In view of this situation, the board of directors of Baffinland directed its management group to devise a strategy that would enable the development of the Mary River project. From this effort emerged the proposal for the early revenue phase of the Mary River project, which represents a phased approach to the execution of the larger project. The early revenue phase will see the early development of the mine with the production of approximately 3.5 million tons per year of iron ore; the transportation of iron ore by trucks to Milne Port; the full development of Milne Port infrastructure, including a loading dock. Approximately 3.5 million tons of iron ore will be shipped from Milne Port during the open-water season, using existing ore carriers owned and operated by other companies, which are called market vessels.*

*Undertaking this limited scope of work for the early revenue phase results in a more modest but still significant investment of approximately \$750 million, which will enable Baffinland to generate revenues from the sale of iron ore as early as 2015.*<sup>217</sup>

However as noted in Volume 9 of the FEIS Addendum, other than more detailed development of alternative of the Early Revenue Phase, there was no update to the alternative development scenarios provided in the FEIS for the original Mary River Project Proposal because Baffinland did not consider that

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<sup>216</sup> FEIS Addendum, Volume 1, Section 3.0, at p. 31.

<sup>217</sup> E. Madsen, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, pp. 37-38, lines 12-26 and lines 1-19.

there were any new alternative development scenarios to be considered at this point. As candidly outlined by Baffinland during the following exchange at the Public Hearing:

[S. Sarpinak]

*What if your approval isn't granted for this early revenue phase? And does this mean that you would have to review the Steensby Inlet port? So I'm asking what happens if this early revenue phase isn't approved?...*

[G. Missal]

*...I guess there's a fairly blunt answer to that question. It would be a very big problem for us. At the moment, we can't develop the big project that's been approved, and that's why we're asking for permission to develop this smaller project.<sup>218</sup>*

## **6.2.2 Conclusions and Recommendations of the Board**

Term and condition 178 of the existing Project Certificate addresses the area of Alternatives Analysis.

The Board had determined that existing term and condition 178 requires no changes.

## **6.3 Cumulative Effects**

### **6.3.1 Views of the Proponent**

In assessing the cumulative effects of the Early Revenue Phase Proposal, the Proponent updated the temporal boundaries of the cumulative effects assessment to reflect that the Early Revenue Phase Proposal, if it were to go ahead, would add approximately 4-5 years of mining, transporting and shipping to the original 21 year operating phase of the mine as assessed by the Board under the Approved Project timelines.<sup>219</sup>

In the Project Description and Mining Plan sections of the FEIS Addendum, the Proponent outlines the temporal boundaries of the project in more detail and clarifies that the Proponent is expecting a 21 year overlap between the Early Revenue Phase Proposal and the Approved Project as follows:

*The mining plan for the ERP will focus in an area of the open-pit with a low stripping rate. Further production details are included in Table 3-2.1 (ore and waste rock*

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<sup>218</sup> S. Sarpinak, Community Representative, Igloolik, NIRB Public Hearing File No.: 08MN053 Transcript, January 29, 2014, p. 697, lines 9-12 and response by G. Missal, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 29, 2014, p. 697, lines 17-21.

<sup>219</sup> FEIS Addendum, Volume 9, Section 1.2.2, at p. 1.

*production schedule). It is expected that the ERP will produce for five years on its own, after which time production from the Approved Project (18 Mt/a) will start and augment ERP production.*<sup>220</sup>

Table 3-2.1 in Volume 3 of the FEIS Addendum demonstrates that despite the reference to the ERP being a “Phase”, the Proponent is seeking approval to continue the activities under the Early Revenue Phase Proposal throughout all phases of the life cycle of the Approved Project. As a result, the temporal boundaries of the project would be extended under the Early Revenue Phase Proposal and the mining activity under the Early Revenue Phase Proposal would be added to the nominal mining capacity of 18 Mt/a assessed by the Board in the review of the Approved Project.

As a result, with respect to the total volumes to be mined, the Proponent’s Executive Summary states: *“With the introduction of the ERP, the Mary River Project consists of mining iron ore from the reserve at Deposit No. 1 at a production rate of 21.5 Million tonnes per year (Mt/a).”*<sup>221</sup>

Other than expanding the temporal boundaries of the assessment, only two activities introduced with the Early Revenue Phase Proposal were identified by the Proponent as having the potential to result in a change to the cumulative effects from the Approved Project:

- The transportation of ore by trucks from the Mine Site to Milne Port, and
- The shipment of 3.5 Mt/a of ore via Milne Inlet-Eclipse Sound shipping route.<sup>222</sup>

Specifically, the Proponent reviewed whether the transportation of ore by trucks via the Tote Road would result in increased cumulative effects on air quality and on terrestrial wildlife including caribou, and concluded that no significant cumulative effects would result from this activity.<sup>223</sup> With respect to the shipment of ore via Milne Port, the Proponent also reviewed the potential for cumulative effects on water and sediment quality, marine fish and habitat, as well as marine mammals. The Proponent’s assessment of these potential effects concluded that although there could be effects at the Port site, these effects would be localized (essentially only near the ore loading dock) and that the activities associated with the Early Revenue Phase Proposal would not result in cumulative effects.<sup>224</sup>

## **6.3.2 Views and Concerns of Interested Parties**

During the NIRB consultations in the communities potentially affected by the Early Revenue Phase Proposal, the NIRB heard that based on the information found in the FEIS Addendum it was very difficult for communities to understand the precise temporal scope of the Early Revenue Phase Proposal when

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<sup>220</sup> FEIS Addendum, Volume 3, Section 2.2, at p. 4.

<sup>221</sup> FEIS Addendum, Volume 1, Section 1.0, p. 1.

<sup>222</sup> FEIS Addendum, Volume 1, Section 9.2 at pp. 90-91.

<sup>223</sup> FEIS Addendum, Volume 9, Section 1.4.2 at p. 13.

<sup>224</sup> FEIS Addendum, Volume 1, Section 9.2 at p. 91.

viewed in context with the Approved Project.<sup>225</sup> The Project Schedule and Project Life section of the Popular Summary of the FEIS Addendum stated as follows:

*The construction of the ERP will commence immediately following the amendment to the Project Certificate. The operation of the ERP, expected to begin in the third quarter of 2013, will continue until the larger Approved Project (18 Mtpa) is constructed and fully operational. Based on current market forecasts for iron ore construction of the larger project could begin as early as 2015 with completion by 2019 [emphasis added].*<sup>226</sup>

The use of the word “until” was interpreted by many to mean that production, transportation and shipping under the Early Revenue Phase Proposal would cease upon the Approved Project coming into full production. However, as outlined in the preceding section, setting out the views of the Proponent, Baffinland’s intentions as included in other sections of the FEIS Addendum is to mine concurrently to support both the Early Revenue Phase Proposal and the Approved Project throughout and this was the subject of considerable concern identified at the Public Hearing. As expressed by the representative for the youth of Pond Inlet:

*The youth were shocked to learn of the 21-year shipping plan and stated that no one from the general public has -- had visited or consulted the youth of this new 21-year plan.*<sup>227</sup>

In addition to concerns with the temporal scope of the Early Revenue Phase Proposal and the potential for this scope to create cumulative effects when added to the Approved Project, the Pond Inlet Mary River Project Committee expressed concerns regarding the Proponent’s conclusions that there would be no cumulative effects in the following areas:

*As long as reclamation plans and security deposits are in place, cumulative effects on caribou movement and mortality are not expected. We disagree. Maybe for now, but maybe once the caribou come back to the area it might be a different story. It is concluded that there will be no cumulative effects associated with the increased shipping activities along the Milne Inlet/Eclipse Sound shipping route. We disagree. There may be effects after the third year of operation. I don't know.*

*Effects on marine water and sediment quality will be limited to small areas near the ore loading dock and are predicted not to be significant. We disagree, but we will soon find out if that's true if the project goes ahead. Effects on marine habitat will*

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<sup>225</sup> See for example the summary of comments provided to the NIRB by the residents of Pond Inlet during the public information sessions conducted in October and summarized in the report entitled NIRB’s Consideration of Baffinland’s Mary River Early Revenue Phase Proposal 2013—Public Information Meetings Summary Report at pp. 20-23.

<sup>226</sup> FEIS Addendum, Volume 1, Section 1.6 at p. 4.

<sup>227</sup> T. Anaviapik-Soucie, Pond Inlet, NIRB Public Hearing File No.: 08MN053 Transcript, January 31, 2014, p. 1053-1054, lines 26-27 and lines 1-2.

*be limited to a small footprint of ore and are predicted not to be significant. We disagree, but we will soon find out if that's true if the project goes ahead. Key indicator species from open-water shipping activities are not predicted to be significant. We disagree, but we will soon find out if the project goes ahead.*<sup>228</sup>

### 6.3.3 Views of the Board

For the Early Revenue Phase Proposal, the Proponent identified that the total volume of ore predicted to be present in Deposit #1 is the same as was identified in the Approved Project, as also set out in the ERP fact sheet under the column entitled "Reserves", Baffinland stated that: "The ERP is focused on Deposit No.1 with known reserves of 365 million tonnes estimated at >64 % iron"<sup>229</sup>

At the Public Hearing, the Board questioned whether the additional mining activity under the Early Revenue Phase Proposal could deplete the mine to the extent that the 21 year mine life proposed by the Proponent for the Approved Project would be reduced.

*Based on the 3.5 million tons per year production rate being proposed by the early revenue phase proposal, can Baffinland explain how this additional production is not anticipated to affect the overall 21-year mine life that was assessed under the original Mary River project at 18 million tons per annum?*<sup>230</sup>

In response to this question the Proponent stated:

*So in answer to that question, our exploration activities on deposit 1 have estimated that the activities of mining for -- of 21.5 million tons for 21 years; that's a conservative estimate. The known reserves for deposit 1 would ex -- would exceed that. So we've conservatively estimated that deposit 1 could -- could account for the mining for 21 years at that 21.5 million tons per annum.*<sup>231</sup>

As outlined in Table 6 below, based on the projected capacity of Deposit #1 being 365 million tonnes of ore in total, when the first five years of mining of the Early Revenue Phase Proposal<sup>232</sup> is added to the Approved Project for a total of 21.5 Mt/a for the 21 year mine life it appears to the Board that a total of approximately 470 million tonnes of ore would actually be mined over the course of the Early Revenue Phase Proposal and the Approved Project taking together. It should also be noted that these projections do not account for any additional amounts mined by Baffinland in excess of 3.5 Mt/a pursuant to the operational flexibility sought by the Proponent and discussed in the section that follows.

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<sup>228</sup> C. Sangoya, Pond Inlet Mary River Project Committee, NIRB Public Hearing File No.: 08MN053 Transcript, January 30, 2014, p. 758-759, lines 3-27 and lines 1-2.

<sup>229</sup> FEIS Addendum, Volume 1, ERP Fact Sheet (no page number).

<sup>230</sup> R. Barry, NIRB, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 49, lines 3-9.

<sup>231</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 49, lines 12-19.

<sup>232</sup> Based on the projected volumes of ore mined as set out in the FEIS Addendum, Volume 3, at Table 3-2.1, p. 5.

Also as illustrated in Table 6, even when the total annual production from the Early Revenue Phase combined with the Approved Project is limited to 18 Mt/a, the 365 Mt known reserve in Deposit #1 would be exhausted at approximately year 19 of the mine life.



**Table 6: Projected Mine Production Early Revenue Phase Combined with Approved Project<sup>233</sup>**

Year	Annual Volume (Mt) at up to 21.5 Mt/a	Cumulative Mined Deposit #1	Total from	Volume (Mt) if 18 Mt/a Limit Imposed	Cumulative Mined Deposit #1	Total from
2014	0.40	0.40		0.4		0.4
2015	2.67	3.07		2.67		3.07
2016	3.50	6.57		3.5		6.57
2017	3.50	10.07		3.5		10.07
2018	3.50	13.57		3.5		13.57
2019	4.80	18.37		4.8		18.37
2020	20.00	38.37		18		36.37
2021	21.50	59.87		18		54.37
2022	21.50	81.37		18		72.37
2023	21.50	102.87		18		90.37
2024	21.50	124.37		18		108.37
2025	21.50	145.87		18		126.37
2026	21.50	167.37		18		144.37
2027	21.50	188.87		18		162.37
2028	21.50	210.37		18		180.37
2029	21.50	231.87		18		198.37
2030	21.50	253.37		18		216.37
2031	21.50	274.87		18		234.37
2032	21.50	296.37		18		252.37
2033	21.50	317.87		18		270.37
2034	21.50	339.37		18		288.37
2035	21.50	360.87		18		306.37
	365 Mt Known Reserve Exceeded					
2036	21.50	382.37		18		324.37
2037	21.50	403.87		18		342.37
2038	21.50	425.37		18		360.37
				365 Mt Known Reserve Exceeded		
2039	21.50	446.87		18		378.37
2040	21.50	468.37		18		396.37

<sup>233</sup> Based on the projected volumes of ore to be mined under the Early Revenue Phase Proposal and the Approved Project, as set out in the FEIS Addendum, Volume 3, at Table 3-2.1, p. 5.

Although the Board notes that there may be other iron ore deposits in close proximity to Deposit #1 that could be accessed to ensure the mine operates at the full nominal capacity throughout the mine life, based solely on the evidence presented in this reconsideration, the Board questions the Proponent's conclusion that even a doubling of the rate of mining Deposit #1 would have no effect on the projected life of mine.

### **6.3.4 Conclusions and Recommendations of the Board**

Given the discrepancy between the projections regarding the total volume of high grade iron ore available in Deposit #1 and the total cumulative volume of ore that would be mined if the Early Revenue Phase Proposal proceeds for 5 years (even assuming mining without accounting for operational flexibility, as discussed in the section that follows) and then continues in combination with the Approved Project already approved under Project Certificate No.: 005 for the mine life of 21 years, in the Board's view the combined effect will be to exhaust the projected reserve of 365 tonnes in approximately year 15-16 of combined production under the Early Revenue Phase Proposal and the Approved Project. On the evidence before it, the Board is not persuaded that Baffinland's conclusion that the Early Revenue Phase Proposal continuing through the mine life would not reduce the mine life as assessed in the Approved Project and this conclusion does not accurately reflect the cumulative effect of the ERP Proposal on the capacity of the reserve. As noted by the Proponent, in the event that exploration specifically identifies additional reserves that may be mined to support the project, it is expected that the proposed exploitation of these reserves would require the Board to revisit the environmental assessments to date to determine whether the development of the additional reserves would be allowed to proceed.

As the "ripple effects" of a higher mining rate and shortened mine life would be felt in all potential effects associated with the mine, including socio-economic and ecosystemic, the Board has concluded that it is appropriate to recommend a limit on total mining from Deposit #1 directed at mitigating the cumulative effect of the Early Revenue Phase Proposal when combined with the Approved Project on the capacity of the reserves associated with Deposit #1. In establishing this limit, the Board recognizes that the projected 365 million tonne reserve could still be exceeded by some 10% if the Early Revenue Phase Proposal is mined at its full projected capacity prior to mining commencing under the Approved Project, but given the conservative nature of the estimate and the likely variability in being able to mine at full capacity in any given year, the Board is confident that allowing for total mining of 18 million tonnes per annum once mining is taking place in support of both the Early Revenue Phase proposal and the Approved Project would not appreciably reduce the 21 year projected life of the mine.

The following new term and condition, **Condition 179 (c)** should be added to a Cumulative Effects section:

When mining commences under both the Approved Project and the Early Revenue Phase Proposal, the total volume of ore mined from Deposit #1 in any given calendar year shall not exceed 18 million tonnes.

## 6.4 Operational Variability/Flexibility

### 6.4.1 Views of the Proponent

Although not expressly referenced in the Proponent's FEIS Addendum, at the Technical Meetings and subsequently at the Public Hearing, Baffinland identified that due to a number of factors that may limit, in any given year, the ability of the Proponent to mine, transport and ship the full volume of ore (3.5 million tonnes per annum) proposed under the Early Revenue Phase Proposal, that no annual limits should be placed on the number of ship transits, as a certain level of "operational flexibility" is required.<sup>234</sup> Baffinland also noted that for similar reasons, operational flexibility is required with respect to the number of truck transports on the Tote Road on an annual basis. As summarized in the Proponent's closing statement:

*Regarding operation flexibility, Baffinland requires a degree of flexibility to account for potential delays caused by dock loading facilities, the availability of market vessels, and the variability of the open-water season. For these reasons, Baffinland also requests that the Nunavut Impact Review Board grant Baffinland operational flexibility when making a final recommendation to the minister.*

*On Wednesday this week, I presented the reasons underlying the need for operational flexibility, and on Thursday, I outlined how the level of operational flexibility is reflected in the environmental assessment, which covered the range of expected ore shipments along the northern shipping route and the number of haul truck transits on the tote road.<sup>235</sup>*

In response to questioning from the Board staff, the actual extent of operational flexibility requested by the Proponent for the Early Revenue Phase was described as follows:

*Secondly, we've been asked about what we mean by Baffinland's request for "operational flexibility". We've been asked to clarify operationally how much variation might there be to these numbers. A mining operation inherently has some variability due to many potential factors, including operational realities, ore production, logistics, weather -- and this includes ice coverage along the shipping -- markets for iron ore, availability and size of ships, as well as the company obligations under customer contracts.*

*The issue of flexibility has been brought up before the parties and the Nunavut Impact Review Board staff throughout the environmental assessment of this early*

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<sup>234</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, p. 71, lines 1-7.

<sup>235</sup> E. Madsen, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 31, 2014, pp. 1115 and 1116, lines 18-25 and lines 7-13.

*revenue phase and, most recently, the technical meetings in November in Iqaluit where the company showed that the actual shipping transits could vary by up to 20 percent. We have thought about this, and we would like to note that the Qikiqtani Inuit Association, who is the landowner for this region and who we have signed an Inuit Impact Benefit Agreement, has suggested a level of variability of 20 percent, [with reference to the number of ship transits] and this is found in their submission and recommendation FM2-2, page 14...*

*Besides this, Baffinland is suggesting that this 20 percent variability threshold should also be applied to ore truck transits. This threshold provides two things: It allows for a level of operational variability that is normal for an operating mine, especially for the location of the Mary River project. And two, it allows for all participants that this sets a clear threshold for when we have to come to the Nunavut Impact Review Board for an amendment.<sup>236</sup>*

Given that this level of operational flexibility was not clearly requested within the FEIS Addendum, in response to concerns expressed by parties that the potential additive effect of an additional 20% has not been fully and adequately assessed in the FEIS Addendum, Baffinland concluded:

*With the conservative approach we have used for the basis of the environmental impact assessment, Baffinland is confident that a 20 percent increase would not have a significant adverse effect on the biophysical valued ecological components, and this is why we are requesting this variability.<sup>237</sup>*

## **6.4.2 Views and Concerns of Interested Parties**

As referenced by Baffinland at the Public Hearing, the Qikiqtani Inuit Association had referred to operational flexibility in its written submissions, filed in advance of the Public Hearing, as follows:

*Part of the scope of the ERP is to increase the total production rate of the Mary River Project from 18 Mt/year to 21.5 Mt/year. QIA recognizes the need for the Proponent to retain some level of operational flexibility within a reasonable range of parameters, but note that effective limits must be placed on ship transits to ensure that they do not increase unchecked and harm the environment. An increase in ore shipments through Milne that exceeds 20% per annum of the proposed ERP quantity (3.5 Mt/year) is recommended.<sup>238</sup>*

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<sup>236</sup> E. Madsen, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, pp. 316-318, lines 19-27, lines 1-15 and lines 21-27 and lines 1-5.

<sup>237</sup> E. Madsen, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 28, 2014, p. 318, lines 6-12.

<sup>238</sup> The Qikiqtani Inuit Association, Final Written Submission, January 15, 2014, Executive Summary at p. ii.

Specifically, the Qikiqtani Inuit Association suggested the following be added to the Project Certificate to identify the upper threshold for operational flexibility with respect to ore shipping that would trigger the need for reassessment as follows:

*Shipping impacts along the northern or southern route will be reassessed if the... increases the number of annual ship transits or their total ore-carrying capacity (3.5 Mt/year) by more than 20% from Milne Inlet.*<sup>239</sup>

With respect to shipping related impacts, Environment Canada stated the following regarding Baffinland's request for operational flexibility:

*To minimize shipping-related impacts, Environment Canada also recommended limiting the number of ships going to Milne Inlet each year. Baffinland disagreed with this recommendation, indicating that they require operational flexibility because they cannot predict exactly how much ore they will need to ship in a given year or the size of vessels that will be available to carry that ore to market. Environment Canada understands that operational flexibility is necessary, but EC is of the opinion that there must be a limit to that flexibility to ensure that monitoring programs and adaptive management are appropriate.*<sup>240</sup>

The Hamlet of Pond Inlet shared similar concerns, stating as follows in their closing statement:

*During this hearing, we were also informed that Baffinland would like to have no limits to the number of ships, and while we understand that Baffinland requires operational flexibility, not having a clear understanding of how many ships would be coming through leaves too many questions in our minds and opens the door to too many impacts. We're not comfortable with that concept, so we could like some clarification and some limits to be drawn on that.*<sup>241</sup>

On the first day of the Public Hearing and prior to the Proponent clearly stating the extent of the operational variability requested, Fisheries and Oceans Canada, on behalf of several of the Federal intervenors expressed concerns about the extent to which the operational flexibility requested by Baffinland was adequately accounted for in the assessments conducted in support of the FEIS Addendum, stating:

*I guess I'll speak for other departments who also had the same concern. It goes back to the discussion we were having a little earlier about 3.5 million tons as being a nominal amount of iron ore that would be mined. And Baffinland had indicated*

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<sup>239</sup> The Qikiqtani Inuit Association, Final Written Submission, January 15, 2014, QIA Comment Reference Number FM-2 at p. 13.

<sup>240</sup> M. Dahl, Environment Canada, NIRB Public Hearing File No.: 08MN053 Transcript, January 30, 2014, p. 835, lines 3-14.

<sup>241</sup> S. Elverum, Hamlet of Pond Inlet, NIRB Public Hearing File No.: 08MN053 Transcript, File No.: 08MN053 Transcript, January 31, 2014, pp. 1102-1103, lines 20-27 and line 1.

*that the -- they required operational flexibility with this amount. And I guess what we were looking for was maybe some clarification on what that operational flexibility might look like. Are we looking at a doubling of it potentially, a tripling of it? Because, at some point, we feel that the effects assessments that have been done would not, perhaps, accurately represent a different scenario. Like, Fisheries and Oceans Canada has assessed this project based on the -- the tonnage that's going to be mined, based on the shipping frequency that was proposed to us, and that's the assessment that we've done. A doubling or tripling or whatever scenario as Baffinland may propose may or may not fall within what we feel is what we've assessed. So if maybe some additional clarification could be provided on that?*<sup>242</sup>

Baffinland deferred the question and responded with the clarification as outlined in the preceding section that 20% variability was the extent of the operational flexibility being sought by the Proponent with respect to the ore shipping and truck transport aspects of the project.

Similarly Parks Canada, asked for clarification regarding whether operational flexibility could be granted with respect to the number of vessels and transits in any given year but whether the volume of ore shipped out of Milne Inlet in any given year could be limited:

*So recognizing that it's difficult to predict the numbers of ships that are going to go through, depending on the type of ship that -- that -- like, the size of the ship, we were wondering if Baffinland is committing to a maximum amount of tonnage per year going out through Milne? So even though you're not committing to a number of ships going through, are you committing to 3.5 million tons per year? Let's say, in one year you have bad weather and not as much goes out, would you add it on to the next year? Or would you max out at 3.5 million tons per year?*<sup>243</sup>

In response to this question, Baffinland indicated the following:

*...the main point that we're making here is that there are numerous factors that affect what we're able to produce in a year, so there is --there is the mining, the operational mining, which affects production rates, so there could be slowdowns there and difficulties there where you may not get the 3.5 million tons in a year. There is also the markets overseas, which may not, you know, need that amount of ore in that year, or in certain years, they may want to make up for additional ore in a following year, so the main point is that, you know, we have done our assessment which is -- which is credible for a nominal 3.5 million tons, and we want to maintain that operational flexibility that would account for shortfalls in some years and then additional tonnage in other years. And those -- and that's -- that's just a reality of the iron ore market. There's -- there's a whole bunch of factors that need to be*

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<sup>242</sup> G. Williston, Fisheries and Oceans Canada, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, pp. 160-161, lines 7-27 and line 1.

<sup>243</sup> A. Stoddart, Parks Canada, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, pp. 130-131, lines 19-27 and lines 1-5.

*considered, so when we're talking about operational flexibility, that's what we're talking about.*<sup>244</sup>

In addition, representatives from the Qikiqtani Inuit Association also questioned the extent to which operational flexibility also applied to the amount of ore actually mined, not just shipped from Milne Inlet in any given year:

*This 20 percent flexibility you're referring to, you want to add it to your estimate? Is that what it implies? Whenever -- if you need to use 20 percent flexibility on an annual basis, 3.5 million tons of ore, plus 20 percent would be 4 point -- over 4 million tons, if you add that 20 percent flexibility. 3.5 million tons with the 20 percent flexibility would be about 60 ships. I don't know if that can be supported by the communities. That's my other question. How -- how are you going to try to utilize that on an annual basis?*<sup>245</sup>

Baffinland responded as follows:

*...the reality with any project where in certain years we may not have the customer demand for our ore, or we may run into operational issues where we're not able to produce enough ore. So in some years we could be below 3.5 million tons, and we recognize that, and in some years, we may have to make up for that demand, and so because of that reason, we've assessed that -- that difference, and Enookie is right, 20 percent, in addition to 3.5, is an extra tonnage, but that extra tonnage is well within the range of what we've assessed for ship transits. So to be very specific, we've assessed ships up to 110,000 deadweight tons and 64 transits, so if you do the math on that, that number of ships can more than account for the 20 percent variability in tonnage. So in other words, Enookie, if we were to ship 20 percent more ore, 20 percent more than 3.5 million tons, that amount of ore could fit within the size of the ship and the number of ships that we've assessed. But to reiterate, in any environmental assessment, you're assessing a reasonable case and an average case of what's reasonable, and you're also being conservative to account for more environmental effects than you predict may actually occur. So our assessment has done just that. We've assessed more tonnage than we expect to actually move in any given year.*<sup>246</sup>

### 6.4.3 Views of the Board

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<sup>244</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 27, 2014, pp. 131-132, lines 9-27 and lines 1-2.

<sup>245</sup> E. Inuarak, Qikiqtani Inuit Association, NIRB Public Hearing File No.: 08MN053 Transcript, January 31, 2014, p. 1027, lines 13-23.

<sup>246</sup> O. Curran, Baffinland, NIRB Public Hearing File No.: 08MN053 Transcript, January 31, 2014, p. 1029, lines 1-27.

While the Board recognizes that there are a number of factors that are outside the Proponent's control that could create the need for operational flexibility and indeed, the Board recognizes that some of the recommended revised terms and conditions in Project Certificate No. 005 such as ceasing shipping activities to avoid aggregations of marine mammals, etc. may also pose external limits on the ore volumes that may be shipped on an annual basis via the Milne Port site, the Board is not comfortable with allowing complete and on-going operational flexibility throughout the Early Revenue Phase Proposal as sought by the Proponent. However, in contrast to the Approved Project, Baffinland does not yet know the size or numbers of vessels for ore shipment during the open water season that will be available for the Early Revenue Phase Proposal and therefore terms and conditions limiting the number of transits is not a practical means of establishing appropriate limits on the project activities while balancing the need for operational flexibility.

On this basis, the Board finds that it is appropriate to place a limit on operational flexibility on the basis of the total ore volume that may be transported via the Tote Road and shipped from Milne Inlet in any given year.

#### **6.4.4 Conclusions and Recommendations of the Board**

Term and condition 179 of the existing Project Certificate addresses Operational Variability/Flexibility.

The following existing term and condition requires no changes: 179

The following new terms and conditions **Condition 179(a)** and **Condition 179(b)** should be added to the Operational Variability/Flexibility section:

**Condition 179(a):** In any given calendar year, the total volume of ore shipped via Milne Inlet, shall not exceed 4.2 million tonnes.

**Condition 179(b):** In any given calendar year, the total volume of ore transported by truck on the Milne Inlet Tote Road shall not exceed 4.2 million tonnes.

### **7. RECOMMENDATION TO THE MINISTER**

After due consideration and in accordance with the process for reconsidering an existing Project Certificate established under Article 12, Part 8, Section 12.8.2 of the Nunavut Land Claims Agreement and reflecting the primary objectives of the Nunavut Land Claims Agreement, the Board has determined that Baffinland Iron Mines Corporation's Early Revenue Phase Proposal, NIRB File No.: 08MN053 can proceed in accordance with the Board's Public Hearing Report and recommended.

### **8. RECOMMENDED PROJECT SPECIFIC TERMS AND CONDITIONS**



As set out in Sections 12.7.1 and 12.7.2 of the NLCA the NIRB has the jurisdiction to establish a project-specific monitoring program to: measure the ecosystemic and socioeconomic effects of a project; assess whether the project is in compliance with the prescribed project terms and conditions; share information with regulatory agencies to support the enforcement of land, water or resource use approvals and agreements; and to assess the accuracy of predictions contained in the environmental impact statements. Given the Board's application of the precautionary approach to several aspects of this Early Revenue Phase Proposal, in the Board's view project-specific monitoring will play a crucial role in addressing the uncertainty regarding project effects and enabling all parties to adapt mitigation measures on an ongoing basis to ensure the approved Mary River Project Proposal and the associated Early Revenue Phase Proposal's negative effects are prevented or limited to the extent possible.

The role of the Board with respect to the establishment of monitoring programs is to focus the terms and conditions in relation to the Project. With respect to existing or future general regional and territorial monitoring programs that may include some of the same monitoring parameters/indicators as the project-specific monitoring program, the NLCA also directs the NIRB to avoid duplication but facilitate co-ordination and integration between the project-specific monitoring programs required by the NIRB and more general programs such as the Nunavut General Monitoring Program. Where the requirements of regional or territorial programs are more extensive or substantively different than those established through the Project Certificate, at all times the Proponent must ensure compliance with the Project Certificate terms and conditions.

The NIRB's monitoring program for the approved Mary River Project was developed after consultation with responsible authorities, the resource and land owners and the proponent following a Regulators' Meeting held in Iqaluit, Nunavut on December 18-19, 2012 after the Minister has issued a decision that the project could proceed to obtain regulatory authorizations and providing the Minister's direction regarding recommended terms and conditions. A short time after the Regulators' Meeting, on December 28, 2012 the NIRB issued Project Certificate 005 for the Mary River Project.

The project-specific monitoring program, typically issued as an appendix to the Project Certificate may not be issued in final form until some months after key regulatory authorizations, including land use permits, water licences, mineral leases, etc. are issued so that the monitoring program supplements and supports but does not duplicate the monitoring requirements in regulatory and land use instruments. Given the timing of the Proponent's notice to the NIRB regarding the application for the Early Revenue Phase Proposal, the NIRB postponed finalization of the monitoring program for the approved Mary River Project to follow the reconsideration of terms and conditions of Project Certificate 005 for the Early Revenue Phase Proposal.

It is important to remember that the NIRB's monitoring program will have varying requirements over the course of the project lifecycle, and that monitoring requirements will apply from construction to eventual abandonment and reclamation. In areas where there may be a need for flexibility in relation to the terms and conditions of the Project Certificate or their application, the NIRB has endeavoured to reflect this in the associated language and/or acknowledge that objectives may be achieved through various means. In addition, in the event that the monitoring program needs to be modified to better achieve its purpose, the Board, the Proponent, the Designated Inuit Organization or other interested parties may cause the Board, under Section 12.8.2 of the NLCA to revisit the monitoring program, or any other terms and conditions in the NIRB Project Certificate.

As set out in Sections 12.7.1 and 12.7.2 of the NLCA the NIRB has the jurisdiction to establish a project-specific monitoring program to: measure the ecosystemic and socioeconomic effects of a project; assess whether the project is in compliance with the prescribed project terms and conditions; share information with regulatory agencies to support the enforcement of land, water or resource use approvals and agreements; and to assess the accuracy of predictions contained in the environmental impact statements. Given the Board's application of the precautionary approach to several aspects of the terms and conditions of the approved Project Certificate for the Mary River Project and the reconsideration of these terms and conditions in light of the ERP proposal, in the Board's view project-specific monitoring will play a crucial role in addressing the uncertainty regarding project effects and enabling all parties to adapt mitigation measures on an ongoing basis to ensure the Project's negative effects are prevented or limited to the extent possible.

The role of the Board with respect to the establishment of monitoring programs is to focus the terms and conditions in relation to the Project. With respect to existing or future general regional and territorial monitoring programs that may include some of the same monitoring parameters/indicators as the project-specific monitoring program, the NLCA also directs the NIRB to avoid duplication but facilitate co-ordination and integration between the project-specific monitoring programs required by the NIRB and more general programs such as the Nunavut General Monitoring Program.<sup>247</sup> Where the requirements of regional or territorial programs are more extensive or substantively different than those established through the Project Certificate, at all times the Proponent must ensure compliance with the Project Certificate terms and conditions.

In order to co-ordinate, integrate and avoid duplication with other monitoring programs, but also to ensure that the NIRB's project-specific monitoring program yields the information required to measure effects and adequately assess compliance with terms, conditions, regulatory instruments and agreements, the NIRB's monitoring program is developed after consultation with responsible authorities, the resource and land owners and the proponent following a Regulators' Meeting that typically occurs within several weeks after the Minister has issued a decision that the project can proceed to obtain regulatory authorizations and providing the Minister's direction regarding recommended terms and conditions. A short time after the Regulators' Meeting, the NIRB issues the Project Certificate, but the project-specific monitoring program, which is usually issued as an Appendix to the Project Certificate may not be issued in final form until some months after key regulatory authorizations, including land use permits, water licences, mineral leases, etc. are issued so that the monitoring program supplements and supports but does not duplicate the monitoring requirements in regulatory and land use instruments.

Given the timing of the submission to the NIRB of the Proponent's NLCA Section 12.8.2 application for the ERP Proposal, the NIRB's monitoring program for the approved Mary River project has yet to be finalized. Should the Minister of Aboriginal Affairs and Northern Development Canada accept the Board's report, the NIRB will be required to amend Project Certificate No.: 005 to include the accepted

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<sup>247</sup> See Sections 12.7.4 and 12.7.5 of the NLCA.

changes; following this, and the final issuance of key regulatory authorizations for the ERP Proposal, the NIRB will finalize the monitoring program for the Mary River Project and associated ERP Proposal.

It is important to remember that the NIRB's monitoring program will have varying requirements over the course of the project lifecycle, and that monitoring requirements will apply from construction to eventual abandonment and reclamation. In areas where there may be a need for flexibility in relation to the terms and conditions of the Project Certificate or their application, the NIRB has endeavoured to reflect this in the associated language and/or acknowledge that objectives may be achieved through various means. In addition, in the event that the monitoring program needs to be modified to better achieve its purpose, the Board, the Proponent, the Designated Inuit Organization or other interested parties may cause the Board, under Section 12.8.2 of the NLCA to revisit the monitoring program, or any other terms and conditions in the NIRB Project Certificate.

### 8.4.1 Format of Recommendations

Wherever possible, the NIRB has continued to implement the following format for the project-specific terms and conditions set out within this report, so as to maintain consistency with the existing Project Certificate and provide clear direction on the intended application, objectives and reporting requirements:

**Category:** Identifies the relevant environmental component or project activity to which the term and condition applies. Wherever possible categories have been labelled so as to directly associate back to the Final Environmental Impact Statement and Environmental Impact Statement Guidelines prepared for the Project.

**Responsible Parties:** Identifies the parties responsible for implementation of the term and condition. While this is generally the Proponent, at times other agencies have been implicated as appropriate.

**Project Phase:** Identifies the phase(s) of Project development to which the term and condition is applicable. Project phase may include any one or more of the following:

- Construction – includes site preparation and staging of materials and equipment in advance of construction
- Operations
- Temporary Closure /Care and Maintenance
- Closure and Post-Closure Monitoring – includes abandonment, decommissioning and reclamation

**Objective:** Provides a short description of the impact or effect being mitigated. Where relevant, expectations regarding the timing for when terms and conditions will be deemed to be satisfied (i.e. sunset clause), who has discretion for determining it is satisfied has been provided.

**Term or Condition:** Provides specific direction on the required action or follow up. In most instances the NIRB has endeavoured to use generalized wording to allow for maximum flexibility in achieving the stated objective, however more explicit direction has been provided where deemed necessary.

**Reporting Requirements:** Sets out any specific reporting parameters required to measure achievement of objectives or to demonstrate compliance, as well as the required frequency of reporting. Consideration will be given to coordination of Project Certificate reporting requirements with reporting requirements as established by other regulatory instruments associated with the Project.

It should be noted that, for some of the existing terms and conditions of Project Certificate No.: 005, a non-binding **Commentary** section had also been added following the specific term and condition as an aid to interpretation. The Commentary section reflects clarification of the term and condition, recording the common understanding and interpretation resulting from discussions and guidance provided at the Project Certificate Workshop held in Iqaluit on December 18-19, 2012. The Commentary section has been omitted from the revised terms and conditions set out in section 8.2 below; should this report be accepted by the Minister of Aboriginal Affairs and Northern Development, a Regulators' Meeting would be scheduled by the NIRB to revisit all associated commentary required to ensure effective implementation of approved terms and conditions moving forward.

## 8.5 Recommended Terms and Conditions

The NIRB recommends that all of the project-specific terms and conditions of approved Project Certificate No.: 005, be applied to the Early Revenue Phase Proposal, with the exclusion of the following 13 specific conditions:

- Marine Environment, Marine Water/Ice and Sediment Quality: 78, 82, 84, 85, and 93-96.
- Marine Wildlife and Marine Habitat: 119
- Accidents and Malfunctions: 175
- Alternatives Analysis: 178
- Transboundary Effects: 180-182

## GENERAL TERMS AND CONDITIONS

### NIRB Monitoring Responsibilities

1. The NIRB will appoint Monitoring Officers as required to monitor the Project in accordance with the purpose of a monitoring program as set out in section 12.7.2 of the Nunavut Land Claims Agreement for the full life of the Project, including closure and restoration. Subject to direction from the NIRB, the responsibilities of the NIRB Monitoring Officers will include:
  - a. Providing direction to the Proponent, the Terrestrial and Marine Environment Working Groups, regulatory agencies, and the Qikiqtaaluk Socio-Economic Monitoring

- Committee to supply NIRB with reports and information respecting the Project's operations, impacts and the implementation of mitigative measures;
- b. Conducting a periodic evaluation of the monitoring program for the Project;
  - c. Compiling a report on the adequacy of the monitoring program and on the ecosystemic and socio-economic impacts of the Project; and
  - d. Where appropriate, recommending to the NIRB reconsideration of Project Certificate Terms and Conditions in accordance with section 12.8.2 of the Nunavut Land Claims Agreement.
2. The NIRB will report annually (in English and Inuktitut) on the results of its Monitoring Program for the Project.
  3. The NIRB will schedule periodic updates regarding its Monitoring Program for the communities most affected by the Project.
  4. The NIRB Monitoring Officers will schedule periodic site inspections at the Project, coordinating with other regulatory agencies to the extent possible.

### **General Regulatory Requirements**

5. The Proponent must obtain all required federal and territorial permits and other approvals, and shall comply with the requirements of such regulatory instruments.
6. The Proponent shall take prompt and appropriate action to remedy any occasion of non-compliance with environmental laws and regulations and/or regulatory instruments, and shall report any non-compliance as required by law immediately. A description of all instances of non-compliance and associated follow up is to be reported annually to the NIRB.
7. The Proponent shall meet with respective licensing authorities prior to the commencement of construction to discuss the posting of adequate performance bonding. Licensing authorities are encouraged to take every measure to require that sufficient security is posted before construction begins.

### **Monitoring Records**

8. All monitoring information collected pursuant to the Project Certificate and various regulatory requirements for the Project shall contain the following information:
  - a. The name of the person(s) who performed the sampling or took the measurements including any relevant accreditations;
  - b. The date, time and place of sampling or measurement, and weather conditions;
  - c. The date of analysis;
  - d. The name of the person(s) who performed the analysis including any relevant accreditations;
  - e. A description of the analytical methods or techniques used; and
  - f. A discussion of the results of any analysis.

9. The Proponent shall make its monitoring results available, to the fullest extent possible, in English and Inuktitut.
10. The Proponent shall keep and maintain the records, including results, of all Project-related monitoring data and analysis for the life of the Project, including closure and post-closure monitoring.
11. The Proponent shall maintain the Final Environmental Impact Statement (including the FEIS Addendum submitted in support of the Early Revenue Phase Proposal) and the Environmental Effects Monitoring program developed for the Project, with predictions updated as new baseline data is collected.

The Proponent shall establish a Project-specific web portal or web page as a means of making all non-confidential monitoring and reporting information associated with the Project available to the general public. This does not limit what the Proponent may be required to submit to the NIRB or other regulatory authorities to meet reporting requirements.

The NIRB further recommends inclusion of the following *new* terms and conditions and *revisions* to existing terms and conditions of Project Certificate No.: 005, as set out in sections 8.2.1 through 8.2.20 below, for application to the Mary River Project Proposal and associated Early Revenue Phase Proposal.

## ECOSYSTEMIC TERMS AND CONDITIONS

### 8.5.1 Meteorology and Climate (including Climate Change)

<b>ORIGINAL Term and Condition No. 1</b>	<b>1</b>
<b>Category:</b>	Meteorology and Climate – Climate Monitoring
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To provide feedback on the impacts that climate change might be having on the port facilities.
<b>Term or Condition:</b>	The Proponent shall use GPS monitoring or a similar means of monitoring at both port sites and will also use tide gauges at the Steensby Port site to monitor the relative sea levels and storm surges at these sites.
<b>Reporting Requirements:</b>	The Proponent shall summarize and supply these monitoring results to NIRB in the annual project report.

<b>REVISED Term and Condition No. 1</b>	<b>1</b>
<b>Category:</b>	Meteorology and Climate – Climate Monitoring

<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To provide feedback on the impacts that climate change might be having on the port facilities.
<b>Term or Condition:</b>	The Proponent shall use GPS monitoring or a similar means of monitoring at both <b><u>Steensby Port and Milne Port, with tidal</u></b> gauges to monitor the relative sea levels and storm surges at these sites.
<b>Reporting Requirements:</b>	The Proponent shall summarize and supply these monitoring results to NIRB in the annual project report.

## 8.5.2 Air Quality

<b>ORIGINAL Term and Condition No. 7</b>	<b>7</b>
<b>Category:</b>	Air Quality – Monitoring
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To provide feedback on the Project's emissions.
<b>Term or Condition:</b>	The Proponent shall update its Air Quality and Noise Abatement Management Plan to include an expanded regional study area and provide for land-based monitoring stations designed to capture operations phase ship-generated SO <sub>2</sub> and NO <sub>2</sub> emissions through Foxe Basin and along the Hudson Strait.
<b>Reporting Requirements:</b>	The updated plan shall be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

<b>REVISED Term and Condition No. 7</b>	<b>7</b>
<b>Category:</b>	Air Quality – Monitoring
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To provide feedback on the Project's emissions.
<b>Term or Condition:</b>	The Proponent shall update its Air Quality and Noise Abatement Management Plan to provide for <b><u>continuous monitoring at</u></b> land-based monitoring stations designed to capture operations phase ship-generated SO <sub>2</sub> and NO <sub>2</sub> emissions <b><u>at Steensby Port and Milne Port. Continuous monitoring is to be carried out through several shipping seasons at each port as required to determine that emissions are at acceptable levels.</u></b>
<b>Reporting Requirements:</b>	The updated plan shall be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

<b>ORIGINAL Term and Condition No. 8</b>	<b>8</b>
<b>Category:</b>	Air Quality – Greenhouse Gas Emissions
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction and Operations.
<b>Objective:</b>	To provide feedback on the Project's emissions.
<b>Term or Condition:</b>	The Proponent shall demonstrate through monitoring of air quality at the mine site and at the Steensby Inlet Port site that SO <sub>2</sub> and NO <sub>2</sub> emissions remain within predicted levels and, where applicable, within limits established by all applicable guidelines and regulations. In cases where exceedances are manifested, the Proponent shall provide an explanation for the exceedance, a description of planned mitigation, and shall conduct additional monitoring to evaluate the effectiveness of mitigative measures.
<b>Reporting Requirements:</b>	To be included in the Proponent's annual reporting to the NIRB.

<b>REVISED Term and Condition No. 8</b>	<b>8</b>
<b>Category:</b>	Air Quality – Greenhouse Gas Emissions
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction and Operations.
<b>Objective:</b>	To provide feedback on the Project's emissions.
<b>Term or Condition:</b>	The Proponent shall demonstrate through monitoring of air quality at the mine site and at the Steensby Inlet <b><u>and Milne Inlet port sites</u></b> that SO <sub>2</sub> and NO <sub>2</sub> emissions remain within predicted levels and, where applicable, within limits established by all applicable guidelines and regulations. In cases where exceedances are manifested, the Proponent shall provide an explanation for the exceedance, a description of planned mitigation, and shall conduct additional monitoring to evaluate the effectiveness of mitigative measures.
<b>Reporting Requirements:</b>	To be included in the Proponent's annual reporting to the NIRB.

<b>ORIGINAL Term and Condition No. 9</b>	<b>9</b>
<b>Category:</b>	Air Quality – Greenhouse Gas Emissions
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction and Operations.
<b>Objective:</b>	To provide feedback on the Project's emissions.
<b>Term or Condition:</b>	The Proponent shall provide calculations of greenhouse gas emissions generated by activities at the Steensby Inlet port and other Project sources



	including aircraft associated with the Project. Calculations shall take into consideration, fuel consumption as measured by Baffinland's purchase and use as well as the fuel use of its contractors and sub-contractors.
<b>Reporting Requirements:</b>	To be included in the Proponent's annual reporting to the NIRB.

<b>REVISED Term and Condition No. 9</b>	<b>9</b>
<b>Category:</b>	Air Quality – Greenhouse Gas Emissions
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction and Operations.
<b>Objective:</b>	To provide feedback on the Project's emissions.
<b>Term or Condition:</b>	The Proponent shall provide calculations of greenhouse gas emissions generated by activities at the Steensby Inlet <b>and Milne Inlet</b> port <b>sites</b> and other Project sources including aircraft associated with the Project. Calculations shall take into consideration, fuel consumption as measured by Baffinland's purchase and use as well as the fuel use of its contractors and sub-contractors.
<b>Reporting Requirements:</b>	To be included in the Proponent's annual reporting to the NIRB.

<b>ORIGINAL Term and Condition No. 10</b>	<b>10</b>
<b>Category:</b>	Air Quality –Dust Management and Monitoring Plan
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To prevent impacts to air quality from dust dispersion.
<b>Term or Condition:</b>	The Proponent shall update its Dust Management and Monitoring Plan to address and/or include the following additional items: <ul style="list-style-type: none"> <li>a) Outline the specific plans for monitoring dust along the first few kilometres of the rail corridor leaving the Mary River mine site.</li> <li>b) Identify the specific adaptive management measures to be considered should monitoring indicate that dust deposition from trains transporting along the rail route is greater than initially predicted.</li> </ul>
<b>Reporting Requirements:</b>	To be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

<b>REVISED Term and Condition No. 10</b>	<b>10</b>
<b>Category:</b>	Air Quality –Dust <b>Management</b> and Monitoring Plan
<b>Responsible Parties:</b>	The Proponent

<b>Project Phase:</b>	Construction
<b>Objective:</b>	To prevent impacts to air quality from dust dispersion.
<b>Term or Condition:</b>	<p>The Proponent shall update its Dust Management and Monitoring Plan to address and/or include the following additional items:</p> <ul style="list-style-type: none"> <li>a) Outline the specific plans for monitoring dust along the first few kilometres of the rail corridor leaving the Mary River mine site.</li> <li>b) Identify the specific adaptive management measures to be considered should monitoring indicate that dust deposition from trains transporting along the rail route is greater than initially predicted.</li> <li>c) <u>Outline specific plans for monitoring dustfall at intervals along and in the vicinity of the Milne Inlet Tote Road to determine the amount and extent of dustfall.</u></li> <li>d) <u>Identify the specific adaptive management measures to be considered should monitoring indicate that dust deposition from traffic on the Milne Inlet Tote Road is greater than initially predicted.</u></li> </ul>
<b>Reporting Requirements:</b>	To be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

### 8.5.3 Noise and Vibration

<b>NEW Term and Condition No. 14 (a)</b>	<b>14 (a)</b>
<b>Category:</b>	Noise and Vibration- Noise and Vibration Adaptive Management
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To mitigate potential impacts of noise to marine wildlife during project construction
<b>Term or Condition:</b>	The Proponent, through coordination with the MEWG as may be appropriate, shall demonstrate appropriate adaptive management for construction activities at Milne Inlet that have the potential to disrupt marine mammal species, including pile driving and ore dock construction, are undertaken.
<b>Reporting Requirements:</b>	To be included in the Annual Report submitted to the NIRB

<b>NEW Term and Condition No. 14 (b)</b>	<b>14 (b)</b>
<b>Category:</b>	Noise and Vibration- Noise and Vibration Adaptive Management
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Operations
<b>Objective:</b>	To mitigate potential impacts of noise to wildlife and people during project

	operations
<b>Term or Condition:</b>	The Proponent, through coordination with the TEWG as may be appropriate, shall demonstrate appropriate adaptive management for project activities during operations which have the potential to produce noise and sensory disturbance to wildlife and other users of project areas.
<b>Reporting Requirements:</b>	To be included in the Annual Report submitted to the NIRB

<b>ORIGINAL Term and Condition No. 15</b>	<b>15</b>
<b>Category:</b>	Noise and Vibration- Noise and Vibration Monitoring
<b>Responsible Parties:</b>	The Proponent, Qikiqtani Inuit Association, local Hamlet organizations
<b>Project Phase:</b>	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To enhance public safety when travelling around the Project area.
<b>Term or Condition:</b>	The Proponent shall collaborate to the extent possible with the Qikiqtani Inuit Association and local Hamlet organizations when undertaking consultation with all affected communities regarding railway operations. During these consultations, it is recommended that the Proponent provide information including video, audio, and photographic representation as well as any other aids (i.e. models) that may enhance the general public's understanding of railway operations, as well as all safety considerations for members of the public who may be travelling around the project area.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No. 15</b>	<b>15</b>
<b>Category:</b>	Noise and Vibration- Noise and Vibration Monitoring
<b>Responsible Parties:</b>	The Proponent, Qikiqtani Inuit Association, local Hamlet organizations
<b>Project Phase:</b>	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To enhance public safety when travelling around the Project area.
<b>Term or Condition:</b>	The Proponent shall collaborate to the extent possible with the Qikiqtani Inuit Association and local Hamlet organizations when undertaking consultation with all affected communities regarding railway, <b><u>tote road and marine shipping</u></b> operations. During these consultations, it is recommended that the Proponent provide information including video, audio, and photographic representation as well as any other aids (i.e. models) that may enhance the general public's understanding of railway, <b><u>tote road and marine shipping</u></b> operations, as well as all safety considerations for members of the public who may be travelling around the project area.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

## 8.5.4 Hydrology and Hydrogeology

<b>ORIGINAL Term and Condition No. 16</b>	<b>16</b>
<b>Category:</b>	Hydrology and Hydrogeology – Water Infrastructure
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To provide assurance that the potential impacts to flow and quantity of water in the Project area are minimized.
<b>Term or Condition:</b>	The Proponent shall ensure that the water related infrastructure or facilities that are designed and constructed, including the modification of culverts, diversion of watercourses, and diversion of runoff into watercourses along the railway, access roads, the Milne Tote Road, and other areas of the Project site, are consistent with those proposed in the FEIS in terms of type, location, and scope and that the requirements of all relevant regulatory authorities are satisfied advance of constructing those facilities.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No. 16</b>	<b>16</b>
<b>Category:</b>	Hydrology and Hydrogeology – Water Infrastructure
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To provide assurance that the potential impacts to flow and quantity of water in the Project area are minimized.
<b>Term or Condition:</b>	The Proponent shall ensure that the water related infrastructure or facilities that are designed and constructed, including the modification of culverts, diversion of watercourses, and diversion of runoff into watercourses along the railway, access roads, <b>port sites</b> , the Milne Tote Road, and other areas of the Project site, are consistent with those proposed in the FEIS <b>and FEIS Addendum</b> in terms of type, location, and scope and that the requirements of all relevant regulatory authorities are satisfied advance of constructing those facilities.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

## 8.5.5 Groundwater/Surface Water

<b>Original Term and Condition No. 21</b>	<b>21</b>
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<b>Category:</b>	Groundwater/Surface Waters – Aquatic Effects Monitoring Plan
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To mitigate potential impacts to surface and ground waters.
<b>Term or Condition:</b>	The Proponent shall ensure that the scope of the Aquatic Effects Monitoring Plan (AEMP) includes, at a minimum, monitoring of non-point sources of discharge, selection of appropriate reference sites, measures to ensure the collection of adequate baseline data and the mechanisms proposed to monitor and treat runoff, and sample sediments.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No. 21</b>	<b><u>21</u></b>
<b>Category:</b>	Groundwater/Surface Waters – Aquatic Effects Monitoring Plan <b><u>and dustfall monitoring</u></b>
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, <b><u>Operations</u></b>
<b>Objective:</b>	To mitigate potential impacts to surface and ground waters.
<b>Term or Condition:</b>	<p>The Proponent shall ensure that the scope of the Aquatic Effects Monitoring Plan (AEMP) includes, at a minimum:</p> <ul style="list-style-type: none"> <li>a. monitoring of non-point sources of discharge, selection of appropriate reference sites, measures to ensure the collection of adequate baseline data and the mechanisms proposed to monitor and treat runoff, and sample sediments; <b><u>and</u></b></li> <li>b. <b><u>measures for dustfall monitoring designed as follows:</u></b> <ul style="list-style-type: none"> <li>i. <b><u>To establish a pre-trucking baseline and collect data during Project operation for comparison;</u></b></li> <li>ii. <b><u>To facilitate comparison with existing guidelines and potentially with thresholds to be established using studies of Arctic char egg survival and/or other studies recommended by the Terrestrial Environment Working Group (TEWG); and,</u></b></li> <li>iii. <b><u>To assess the seasonal deposition (rates, quantities) and chemical composition of dust entering aquatic systems along representative distance transects at right angles to the Tote Road and radiating outward from Milne Port and the Mine Site.</u></b></li> </ul> </li> </ul>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

### 8.5.6 Landforms, Geology and Geomorphology, Soils and Permafrost

***Note: Terms and conditions 25 through 30 of the existing Project Certificate address potential impacts to Landforms, Geology and Geomorphology, Soils and Permafrost, and all of these should apply to the ERP. The Board has not identified any new terms and conditions to be added to this section.***

## 8.5.7 Vegetation

*Note: Terms and conditions 31 through 40 of the existing Project Certificate address potential impacts to Vegetation, and all of these should apply to the ERP. The Board has not identified any new terms and conditions to be added to this section.*

## 8.5.8 Freshwater Aquatic Environment including Biota and Habitat

<b>NEW Term and Condition No. 48 (a)</b>	<b>48 (a)</b>
<b>Category:</b>	Freshwater Aquatic Environment – Arctic char
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations
<b>Objective:</b>	To determine presence and health of arctic char in freshwater aquatic habitat.
<b>Term or Condition:</b>	The Proponent develop plans to conduct additional surveys for the presence of arctic char in freshwater bodies and ongoing monitoring of arctic char health where applicable, within watersheds proximal to the mine, tote road and Milne Inlet Port project development areas, including but not limited to, Phillips Creek, Tugaat and Qurluktuk. The Proponent shall consult with the MHTO regarding the design, timing, and location of proposed surveys and ongoing monitoring.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

## 8.5.9 Terrestrial Wildlife

<b>ORIGINAL Term and Condition No. 51</b>	<b>51</b>
<b>Category:</b>	Terrestrial Wildlife and Habitat - General
<b>Responsible Parties:</b>	The Proponent and/or TWEG
<b>Project Phase:</b>	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To promote coordination of monitoring efforts.
<b>Term or Condition:</b>	The Proponent, either directly or as part of the TEWG, shall consider and, where appropriate, cooperate with relevant regional and/or community-based monitoring initiatives that raise issues or produce information pertinent to mitigating project-induced impacts.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and</b>	<b>51</b>
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<b>Condition No. 51</b>	
<b>Category:</b>	Terrestrial Wildlife and Habitat - General
<b>Responsible Parties:</b>	The Proponent and/or TWEG
<b>Project Phase:</b>	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To promote coordination of monitoring efforts.
<b>Term or Condition:</b>	The Proponent, either directly or as part of the TEWG, shall consider and, where appropriate, cooperate with relevant regional and/or community-based monitoring initiatives that raise issues or produce information pertinent to mitigating project-induced impacts. <b><u>The Proponent shall give special consideration for supporting regional studies of population health and harvest programs for North Baffin caribou which help address areas of uncertainty for Project impact predictions.</u></b>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No. 53</b>	<b>53</b>
<b>Category:</b>	Terrestrial Wildlife and Habitat - Caribou
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To mitigate impacts to caribou from Project-related traffic.
<b>Term or Condition:</b>	<p>The Proponent shall demonstrate consideration for the following:</p> <ol style="list-style-type: none"> <li>Steps taken to prevent caribou mortality and injury as a result of train and vehicular traffic, including operational measures meant to maximize the potential for safe traffic relative to operations on the railway, Milne Inlet tote road and associated access roads.</li> <li>Monitoring and mitigation measures at points where the railway, roads, trails and flight paths pass through caribou calving areas, particularly during caribou calving times.</li> <li>Evaluation of the effectiveness of proposed caribou crossings over the railway, Milne Inlet tote road and access roads as well as the appropriate number.</li> <li>Development of a surveillance system along the railway corridor to identify the presence of caribou in proximity to the train tracks and operational protocols for the train to avoid collisions and enable caribou to cross the train tracks unimpeded.</li> <li>Protocols for documentation and reporting of all caribou collisions and mortalities, as well as mechanisms for adaptive management responses designed to prevent further such interactions.</li> </ol>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and</b>	<b>53</b>
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<b>Condition No. 53</b>	
<b>Category:</b>	Terrestrial Wildlife and Habitat - Caribou
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To mitigate impacts to caribou from Project-related traffic.
<b>Term or Condition:</b>	<p>The Proponent shall demonstrate consideration for the following:</p> <ul style="list-style-type: none"> <li>a. Steps taken to prevent caribou mortality and injury as a result of train and vehicular traffic, including operational measures meant to maximize the potential for safe traffic relative to operations on the railway, Milne Inlet tote road and associated access roads. <ul style="list-style-type: none"> <li>i. <u>Specific measures intended to address the reduced effectiveness of visual protocols for the Milne Inlet Tote Road and access roads/trails during times of darkness and low visibility must be included.</u></li> </ul> </li> <li>b. Monitoring and mitigation measures at points where the railway, roads, trails and flight paths pass through caribou calving areas, particularly during caribou calving times. <u>The details of these monitoring and mitigation measures shall be developed in conjunction with the Terrestrial Environment Working Group.</u></li> <li>c. Evaluation of the effectiveness of proposed caribou crossings over the railway, Milne Inlet tote road and access roads as well as the appropriate number.</li> <li>d. Development of a surveillance system along the railway corridor to identify the presence of caribou in proximity to the train tracks and operational protocols for the train to avoid collisions and enable caribou to cross the train tracks unimpeded.</li> <li>e. Protocols for documentation and reporting of all caribou collisions and mortalities, as well as mechanisms for adaptive management responses designed to prevent further such interactions.</li> </ul>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No. 54</b>	<b>54</b>
<b>Category:</b>	Terrestrial Wildlife and Habitat - Caribou
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction – within six (6) months of issuance of Project Certificate
<b>Objective:</b>	To Update the Terrestrial Environmental Management and Monitoring Plan
<b>Term or Condition:</b>	<p>The Proponent shall provide an updated Terrestrial Environmental Management and Monitoring Plan which shall include, but not be limited to the following:</p> <ul style="list-style-type: none"> <li>a. Details of the methods and rationale for conducting monitoring prior to the commencement of construction;</li> <li>b. Monitoring for caribou presence and behavior during railway</li> </ul>



	<p>construction;</p> <p>c. Description and justification of statistical design or other means of determining effect and proposed analyses to support the conclusions drawn from monitoring impacts of the mine and related infrastructure on wildlife;</p> <p>d. Details of monitoring and mitigation activities, including:</p> <ol style="list-style-type: none"> <li>Dust fall (fugitive and Total Suspended Particulates), that addresses methods to reduce risk to caribou forage from dust fall;</li> <li>Snow track surveys during construction and the use of video-surveillance to improve the predictability of caribou exposure to the railway. Using the result of this information, an early warning system for caribou on the railway shall be developed for operation.</li> </ol> <p>e. Details of monitoring thresholds related to level of mitigation and management; and</p> <p>f. Details of a comprehensive hunter harvest survey to determine the effect on caribou populations and potential effects on caribou behaviour resulting from increased human access caused by upgrades to the Milne Inlet tote road (and any other roads if they are shifted from private to public use) and increase local knowledge of the mine site, including establishing pre-construction baseline harvesting data.</p>
<b>Reporting Requirements:</b>	Plan to be submitted to the NIRB and the TEWG within 6 months of issuance of a Project Certificate.

<b>REVISED Term and Condition No. 54</b>	<b>54</b>
<b>Category:</b>	Terrestrial Wildlife and Habitat - Caribou
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction – within six (6) months of issuance of Project Certificate
<b>Objective:</b>	To Update the Terrestrial Environmental Management and Monitoring Plan
<b>Term or Condition:</b>	<p>The Proponent shall provide an updated Terrestrial Environmental Management and Monitoring Plan which shall include, but not be limited to the following:</p> <ol style="list-style-type: none"> <li>Details of the methods and rationale for conducting monitoring prior to the commencement of construction;</li> <li>Monitoring for caribou presence and behavior during railway <b><u>and Tote Road</u></b> construction;</li> <li>Description and justification of statistical design or other means of determining effect and proposed analyses to support the conclusions drawn from monitoring impacts of the mine and related infrastructure on wildlife;</li> <li>Details of monitoring and mitigation activities, <b><u>which should be established in collaboration with the Terrestrial Environment</u></b></li> </ol>

	<p><b><u>Working Group and are expected to include</u></b> including:</p> <ul style="list-style-type: none"> <li>i. Dust fall (fugitive and Total Suspended Particulates), that addresses methods to reduce risk to caribou forage from dust fall;</li> <li>ii. Snow track surveys during construction and the use of video-surveillance to improve the predictability of caribou exposure to the railway <b><u>and Tote Road</u></b>. Using the result of this information, an early warning system for caribou on the railway <b><u>and Tote Road</u></b> shall be developed for operation.</li> <li>e. Details of monitoring thresholds related to level of mitigation and management; and</li> <li>f. Details of a comprehensive hunter harvest survey to determine the effect on caribou populations and potential effects on caribou behaviour resulting from increased human access caused by upgrades to the Milne Inlet tote road (and any other roads if they are shifted from private to public use) and increase local knowledge of the mine site, including establishing pre-construction baseline harvesting data.</li> </ul>
<b>Reporting Requirements:</b>	Plan to be submitted to the NIRB and the TEWG within 6 months of issuance of a Project Certificate.

<b>ORIGINAL Term and Condition No.</b>	<b>58</b>
<b>Category:</b>	Terrestrial Wildlife and Habitat - Reporting
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To mitigate and monitor for impacts to wildlife.
<b>Term or Condition:</b>	<p>Within its annual report to the NIRB, the Proponent shall incorporate a review section which includes:</p> <ul style="list-style-type: none"> <li>a. An examination for trends in the measured natural variability of Valued Ecosystem Components in the region relative to the baseline reporting;</li> <li>b. A detailed analysis of wildlife responses to operations with emphasis on calving and post-calving caribou behaviour and displacements (if any), and caribou responses to and crossing of the railway;</li> <li>c. A description of the extent of dust fall based on measured levels of dust fall (fugitive and finer particles such as TSP) on lichens and blueberries, and ash content of caribou fecal pellets;</li> <li>d. A demonstration and description of how the monitoring results contribute to cumulative effects of the project;</li> <li>e. Any proposed changes to the monitoring survey methodologies, statistical approaches or proposed adaptive management stemming from the results of the monitoring program;</li> </ul>

	f. Any updates to information regarding caribou migration trails. Maps of caribou migration trails, primarily obtained through any new collar and snow tracking data, shall be updated (at least annually) in consultation with the Qikiqtani Inuit Association and affected communities, and shall be circulated as new information becomes available.
<b>Reporting Requirements:</b>	To be included in the Annual Report submitted to the NIRB

<b>REVISED Term and Condition No.</b>	<b>58</b>
<b>Category:</b>	Terrestrial Wildlife and Habitat - Reporting
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To mitigate and monitor for impacts to wildlife.
<b>Term or Condition:</b>	<p>Within its annual report to the NIRB, the Proponent shall incorporate a review section which includes:</p> <ul style="list-style-type: none"> <li>a. An examination for trends in the measured natural variability of Valued Ecosystem Components in the region relative to the baseline reporting;</li> <li>b. A detailed analysis of wildlife responses to operations with emphasis on calving and post-calving caribou behaviour and displacements (if any), and caribou responses to and crossing of the railway, <b><u>the Milne Inlet Tote Road and associated access roads/trails;</u></b></li> <li>c. A description of the extent of dust fall based on measured levels of dust fall (fugitive and finer particles such as TSP) on lichens and blueberries, and ash content of caribou fecal pellets;</li> <li>d. A demonstration and description of how the monitoring results, <b><u>including the railway, road traffic, air traffic and dustfall</u></b> contribute to cumulative effects of the project;</li> <li>e. Any proposed changes to the monitoring survey methodologies, statistical approaches or proposed adaptive management stemming from the results of the monitoring program;</li> <li>f. Any updates to information regarding caribou migration trails. Maps of caribou migration trails, primarily obtained through any new collar and snow tracking data, shall be updated (at least annually) in consultation with the Qikiqtani Inuit Association and affected communities, and shall be circulated as new information becomes available.</li> </ul>
<b>Reporting Requirements:</b>	To be included in the Annual Report submitted to the NIRB

<b>ORIGINAL Term and Condition No.</b>	<b>59</b>

<b>Category:</b>	Terrestrial Wildlife and Habitat – Aircraft Disturbances
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To mitigate aircraft disturbance to wildlife.
<b>Term or Condition:</b>	The Proponent shall ensure that aircraft maintain, whenever possible (except for specified operational purposes such as drill moves, take offs and landings), and subject to pilot discretion regarding aircraft and human safety, a cruising altitude of at least 610 metres during point to point travel when in areas likely to have migratory birds, and 1,000 metres vertical and 1,500 metres horizontal distance from observed concentrations of migratory birds (or as otherwise prescribed by the Working Group) and use flight corridors to avoid areas of significant wildlife importance.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No.</b>	<b>59</b>
<b>Category:</b>	Terrestrial Wildlife and Habitat – Aircraft Disturbances
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To mitigate aircraft disturbance to wildlife <b>and Inuit harvesting.</b>
<b>Term or Condition:</b>	The Proponent shall ensure that aircraft maintain, whenever possible (except for specified operational purposes such as drill moves, take offs and landings), and subject to pilot discretion regarding aircraft and human safety, a cruising altitude of at least 610 metres during point to point travel when in areas likely to have migratory birds, and 1,000 metres vertical and 1,500 metres horizontal distance from observed concentrations of migratory birds (or as otherwise prescribed by the <b>Terrestrial Environment</b> Working Group) and use flight corridors to avoid areas of significant wildlife importance. <b><u>The Proponent, in collaboration with the Terrestrial Environment Working Group shall develop a program or specific measures to ensure that employees and subcontractors providing aircraft services to the Project are respectful of wildlife and Inuit harvesting that may occur in and around project areas.</u></b>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

### 8.5.10 Birds

***Note: Terms and conditions 65 through 75 of the existing Project Certificate address potential impacts to Birds, and all of these should apply to the ERP. The Board has not identified any new terms and conditions to be added to this section.***

### 8.5.11 Marine Environment, Marine Water/Ice and Sediment Quality

<b>ORIGINAL Term and Condition No.</b>	<b>77</b>
<b>Category:</b>	Marine Environment – Working Group
<b>Responsible Parties:</b>	The Proponent, Environment Canada, Fisheries and Oceans Canada, the Government of Nunavut, the Qikiqtani Inuit Association and interested parties.
<b>Project Phase:</b>	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	The MEWG will consult with, and provide advice and recommendations to the Proponent in connection with mitigation measures for the protection of the marine environment, monitoring of effects on the marine environment and the consideration of adaptive management plans. The role of the MEWG is not intended to either duplicate or to affect the exercise of regulatory authority by appropriate government agencies and departments.
<b>Term or Condition:</b>	A Marine Environment Working Group ("MEWG") shall be established to serve as an advisory group in connection with mitigation measures for the protection of the marine environment, and in connection with the Project Environmental Effects Monitoring program, as it pertains to the marine environment. Membership on the MEWG will include the Proponent, Environment Canada, Fisheries and Oceans Canada, the Government of Nunavut, the Qikiqtani Inuit Association and other agencies or interested parties as determined to be appropriate by these key members. Makivik Corporation shall also be entitled to membership on the MEWG at its election. The MEWG members may consider the draft terms of reference for the MEWG filed in the Final Hearing, but they are not bound by them.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No.</b>	<b>77</b>
<b>Category:</b>	Marine Environment – Working Group
<b>Responsible Parties:</b>	The Proponent, Environment Canada, Fisheries and Oceans Canada, the Government of Nunavut, the Qikiqtani Inuit Association and interested parties.
<b>Project Phase:</b>	Construction, Operations, Temporary Closure /Care and Maintenance,

	Closure and Post-Closure Monitoring
<b>Objective:</b>	The MEWG will consult with, and provide advice and recommendations to the Proponent in connection with mitigation measures for the protection of the marine environment, monitoring of effects on the marine environment and the consideration of adaptive management plans. The role of the MEWG is not intended to either duplicate or to affect the exercise of regulatory authority by appropriate government agencies and departments.
<b>Term or Condition:</b>	A Marine Environment Working Group ("MEWG") shall be established to serve as an advisory group in connection with mitigation measures for the protection of the marine environment, and in connection with the Project Environmental Effects Monitoring program, as it pertains to the marine environment. Membership on the MEWG will include the Proponent, Environment Canada, Fisheries and Oceans Canada, <u>Parks Canada</u> , the Government of Nunavut, the Qikiqtani Inuit Association, <u>the Mittimatilik Hunters and Trappers Organization</u> , and other agencies or interested parties as determined to be appropriate by these key members. Makivik Corporation shall also be entitled to membership on the MEWG at its election. The MEWG members may consider the draft terms of reference for the MEWG filed in the Final Hearing, but they are not bound by them.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No.</b>	<b>83</b>
<b>Category:</b>	Marine Environment – Shoreline Effects and Sediment Redistribution
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations
<b>Objective:</b>	To monitor relative sea level and storm surges.
<b>Term or Condition:</b>	The Proponent shall install tidal gauges at the Steensby Inlet Port site to monitor relative sea level and storm surges.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No.</b>	<b>83</b>
<b>Category:</b>	Marine Environment – Shoreline Effects and Sediment Redistribution
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations
<b>Objective:</b>	To monitor relative sea level and storm surges.

<b>Term or Condition:</b>	The Proponent shall install tidal gauges at the Steensby Inlet Port <b>and Milne Inlet Port</b> sites to monitor relative sea level and storm surges.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>NEW Term and Condition No.</b>	<b>83(a)</b>
<b>Category:</b>	Marine Environment – Shoreline Effects and Sediment Redistribution
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations
<b>Objective:</b>	To identify potential for and conduct monitoring to identify effects of sediment redistribution associated with construction and operation of the Milne Port.
<b>Term or Condition:</b>	<b><u>The Proponent shall conduct hydrodynamic modelling in the Milne Inlet Port area to determine the potential impacts arising from disturbance to sediments including re-suspension and subsequent transport and deposition of sediment. The modelling results shall be used to update the marine water and sediment quality monitoring and mitigation program to include activities associated with the construction and operation of the Milne Inlet Port. The monitoring program shall include an ongoing assessment of the potential introduction of metals that bio-accumulate in the marine food chain.</u></b>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No.</b>	<b>86</b>
<b>Category:</b>	Marine Environment – Ballast Water
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To update ballast water discharge impact predictions.
<b>Term or Condition:</b>	Prior to commercial shipping of iron ore, the Proponent shall use more detailed bathymetry collected from Steensby Inlet to model the anticipated ballast water discharges from ore carriers. The results from this modeling shall be used to update ballast water discharge impact predictions and should account for density dependent flow and annual timescales over the project life. Additional sampling should also be undertaken to validate the model and to inform sampling sites and the monitoring plan.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and</b>	<b>86</b>
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<b>Condition No.</b>	
<b>Category:</b>	Marine Environment – Ballast Water
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To update ballast water discharge impact predictions.
<b>Term or Condition:</b>	Prior to commercial shipping of iron ore, the Proponent shall use more detailed bathymetry collected from Steensby Inlet <b>and Milne Inlet</b> to model the anticipated ballast water discharges from ore carriers. The results from this modeling shall be used to update ballast water discharge impact predictions and should account for density dependent flow and annual timescales over the project life. Additional sampling should also be undertaken to validate the model and to inform sampling sites and the monitoring plan.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No.</b>	<b>87</b>
<b>Category:</b>	Marine Environment – Ballast Water
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To prevent invasive species introductions resulting from Project shipping.
<b>Term or Condition:</b>	The Proponent shall develop a detailed monitoring program at a number of sites over the long term to evaluate changes to marine habitat and organisms and to monitor for non-native introductions resulting from Project-related shipping. This program needs to be able to detect changes that may have biological consequences and should be initiated several years prior to any ballast water discharge into Steensby Inlet to collect sufficient baseline data and should continue over the life of the Project.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No.</b>	<b>87</b>
<b>Category:</b>	Marine Environment – Ballast Water



<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To prevent invasive species introductions resulting from Project shipping.
<b>Term or Condition:</b>	The Proponent shall develop a detailed monitoring program at a number of sites over the long term to evaluate changes to marine habitat and organisms and to monitor for non-native introductions resulting from Project-related shipping. This program needs to be able to detect changes that may have biological consequences and should be initiated several years prior to any ballast water discharge into Steensby Inlet <b>and Milne Inlet</b> to collect sufficient baseline data and should continue over the life of the Project.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No.</b>	<b>88</b>
<b>Category:</b>	Marine Environment – Ballast Water
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To prevent invasive species introductions resulting from Project shipping.
<b>Term or Condition:</b>	<p>Prior to commercial shipping of iron ore and in conjunction with the Marine Environment Working Group, the Proponent shall complete a risk analysis regarding ballast water discharge to assess the adequacy of treatment and implications on the receiving environment. This risk analysis shall consider, but not be limited to:</p> <ul style="list-style-type: none"> <li>a. Invasive species;</li> <li>b. Seasonal oceanography;</li> <li>c. Ballast water quality and quantity;</li> <li>d. Receiving water quality;</li> <li>e. Residual physical, chemical, and/or biological effects.</li> </ul>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No.</b>	<b>88</b>
<b>Category:</b>	Marine Environment – Ballast Water
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction

<b>Objective:</b>	To prevent invasive species introductions resulting from Project shipping.
<b>Term or Condition:</b>	<p>Prior to commercial shipping of iron ore and in conjunction with the Marine Environment Working Group, the Proponent shall <del>complete a</del> <b><u>provide an updated</u></b> risk analysis regarding ballast water discharge to assess the adequacy of treatment and implications on the receiving environment. This risk analysis shall consider, but not be limited to:</p> <ul style="list-style-type: none"> <li>a. Invasive species;</li> <li>b. Seasonal oceanography;</li> <li>c. Ballast water quality and quantity;</li> <li>d. Receiving water quality;</li> <li>e. Residual physical, chemical, and/or biological effects; <b>and</b></li> <li>f. <b><u>Any risk assessment analysis regarding ballast water exchange and treatment efficacy in arctic waters.</u></b></li> </ul>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No.</b>	<b>89</b>
<b>Category:</b>	Marine Environment – Ballast Water
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To prevent impacts to marine water quality resulting from ballast water exchange.
<b>Term or Condition:</b>	The Proponent shall develop and implement an effective ballast water management program that may include the treatment and monitoring of ballast water discharges in a manner consistent with applicable regulations and/or exceed those regulations if they are determined to be ineffective for providing the desired and predicted results.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No.</b>	<b>89</b>
<b>Category:</b>	Marine Environment – Ballast Water
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations, Temporary Closure/Care and Maintenance,

	Closure and Post-Closure Monitoring
<b>Objective:</b>	To prevent impacts to marine water quality resulting from ballast water exchange.
<b>Term or Condition:</b>	The Proponent shall develop and implement an effective ballast water management program that may include the treatment and monitoring of ballast water discharges in a manner consistent with applicable regulations and/or exceed those regulations if they are determined to be ineffective for providing the desired and predicted results. <u>The ballast water management program shall include, without limitation, a provision that requires ship owners to test their ballast water to confirm that it meets the salinity requirements of the applicable regulations prior to discharge at the Milne Port, and a requirement noting that the Proponent, in choosing shipping contractors will, whenever feasible, give preference to contractors that use ballast water treatment in addition to ballast water exchange.</u>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No.</b>	<b>90</b>
<b>Category:</b>	Marine Environment – Ballast Water
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To prevent impacts to marine water quality resulting from ballast water exchange.
<b>Term or Condition:</b>	The Proponent shall incorporate into its Shipping and Marine Mammals Management Plan provisions to achieve compliance with the requirements under the International Convention for the Control and Management of Ship's Ballast Water and Sediment (2004).
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No.</b>	<b>90</b>
<b>Category:</b>	Marine Environment – Ballast Water
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To prevent impacts to marine water quality resulting from ballast water

	exchange.
<b>Term or Condition:</b>	The Proponent shall incorporate into its Shipping and Marine Mammals Management Plan provisions to achieve compliance with the requirements under the International Convention for the Control and Management of Ship's Ballast Water and Sediment (2004) <b><u>or its replacement and as implemented by the Canadian Ballast Water and Control Regulations as may be amended from time to time.</u></b>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No.</b>	<b>91</b>
<b>Category:</b>	Marine Environment – Ballast Water
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To prevent impacts to marine water quality in Steensby Inlet.
<b>Term or Condition:</b>	The Proponent shall develop a detailed monitoring plan for fouling that includes sampling areas on ships where antifouling treatment is not applied such as the areas where non-native species are most likely to occur.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No.</b>	<b>91</b>
<b>Category:</b>	Marine Environment – Ballast Water
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To prevent impacts to marine water quality in Steensby Inlet <b><u>and Milne Inlet.</u></b>
<b>Term or Condition:</b>	The Proponent shall develop a detailed monitoring plan for <b><u>Steensby Inlet and Milne Inlet for</u></b> fouling that <b><u>complies with all applicable regulatory requirements and guidelines as issued by Transport Canada, and</u></b> includes sampling areas on ships where antifouling treatment is not applied such as the areas where non-native species are most likely to occur.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and</b>	<b>97</b>
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<b>Condition No.</b>	
<b>Category:</b>	Marine Environment – Spill Prevention
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To prevent impacts to the marine environment along the shipping route.
<b>Term or Condition:</b>	<p>Prior to the commercial shipping of iron ore, the Proponent shall conduct fuel spill dispersion modeling that will, at a minimum, consider:</p> <ul style="list-style-type: none"> <li>a. Modeling of oil spills in the following areas: <ul style="list-style-type: none"> <li>i. Pinch points, including: the mouth of Hudson Strait, the Resolution Island Area, the West End of Hudson Strait and Nottingham Island Area;</li> <li>ii. The approach into Steensby Inlet;</li> <li>iii. Shallow water and shorelines; and,</li> <li>iv. Areas that have been identified as having high flows and/or high concentrations of marine mammals, marine fish or seabirds.</li> </ul> </li> <li>b. Open water and ice-covered conditions;</li> <li>c. Spill volumes up to and including loss of a full tanker cargo; and,</li> <li>d. Differences in the quantity and properties of each type of bulk fuel transported by vessels when they are at, or in transit to, the port at Steensby Inlet.</li> </ul>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No.</b>	<b>97</b>
<b>Category:</b>	Marine Environment – Spill Prevention
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To prevent impacts to the marine environment along the shipping route.
<b>Term or Condition:</b>	<p>Prior to the commercial shipping of iron ore, the Proponent shall conduct fuel spill dispersion modeling that will, at a minimum, consider:</p> <ul style="list-style-type: none"> <li>a. Modeling of oil spills <b>for both the Northern and Southern Shipping Routes, in the following areas <u>representative locations, identified by the Proponent, in consultation with the Marine Environment Working Group along both Shipping Routes, and including :</u></b></li> </ul>

	<ul style="list-style-type: none"> <li>i. Pinch points, including: <del>the mouth of Hudson Strait, the Resolution Island Area, the West End of Hudson Strait and Nottingham Island Area;</del></li> <li>ii. The approaches into Steensby Inlet <b>and Milne Inlet;</b></li> <li>iii. Shallow water and shorelines; and,</li> <li>iv. Areas that have been identified as having high flows and/or high concentrations of marine mammals, marine fish or seabirds.</li> </ul> <ul style="list-style-type: none"> <li>b. Open water and, <b>where applicable,</b> ice-covered conditions;</li> <li>c. Spill volumes up to and including loss of a full tanker cargo; and,</li> <li>d. Differences in the quantity and properties of each type of bulk fuel transported by vessels when they are at, or in transit to, the ports at Steensby Inlet <b>and Milne Inlet.</b></li> </ul>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

### 8.5.12 Marine Wildlife and Marine Habitat

<b>ORIGINAL Term and Condition No. 99</b>	<b>99</b>
<b>Category:</b>	Marine Environment – Supplemental Baseline Assessments
<b>Responsible Parties:</b>	The Proponent, Marine Environment Working Group
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To supplement baseline information and improve predictions for potential impacts to marine wildlife.
<b>Term or Condition:</b>	<p>The Proponent, working with the Marine Environment Working Group, shall consider and identify priorities for conducting the following supplemental baseline assessments:</p> <ul style="list-style-type: none"> <li>b. Establish an all-season, inter-annual baseline in Steensby Inlet that enables effective monitoring of physical and chemical effects of ballast water releases, sewage outfall, and bottom scour by ship props, particularly downslope and downstream from the docks. This shall include the selection and identification of physical, chemical, and biological community/indicator components. The biological indicators shall include both pelagic and benthic species but with emphasis on relatively sedentary benthic species (e.g., sculpins).</li> <li>c. The collection of additional baseline data in Steensby Inlet on walrus, beluga, bearded seal anadromous Arctic Char abundance, distribution ecology and habitat use.</li> <li>d. Enhance baseline data on marine wildlife (fish,</li> </ul>

	<p>invertebrates, birds, mammals, etc.) and to provide more details on species abundance and distribution found in the Project area. This shall include, but not be limited to the following:</p> <ul style="list-style-type: none"> <li>i. Aerial surveys for basking ringed seals throughout the landfast ice of Steensby Inlet and at appropriate control location;</li> <li>ii. Shore-based observations of pre-Project narwhal behavior in Milne Inlet.</li> </ul> <p>Enhance the baseline for affected freshwater systems, which includes control sites to detect Project-related changes before they cause significant harm.</p>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No. 99</b>	<b>99</b>
<b>Category:</b>	Marine Environment – Supplemental Baseline Assessments
<b>Responsible Parties:</b>	The Proponent, Marine Environment Working Group
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To supplement baseline information and improve predictions for potential impacts to marine wildlife.
<b>Term or Condition:</b>	<p>The Proponent, working with the Marine Environment Working Group, shall consider and identify priorities for conducting the following supplemental baseline assessments:</p> <ul style="list-style-type: none"> <li>e. Establish <del>an all-season</del> <b>shipping season</b>, inter-annual baseline in Steensby Inlet <b>and Milne Inlet</b> that enables effective monitoring of physical and chemical effects of ballast water releases, sewage outfall, and bottom scour by ship props, particularly downslope and downstream from the docks. This shall include the selection and identification of physical, chemical, and biological community/indicator components. The biological indicators shall include both pelagic and benthic species but with emphasis on relatively sedentary benthic species (e.g., sculpins).</li> <li>f. The collection of additional baseline data: <ul style="list-style-type: none"> <li>i. in Steensby Inlet on walrus, beluga, bearded seal anadromous Arctic Char abundance, distribution ecology and habitat use; <b>and</b></li> <li>ii. <b><u>In Milne Inlet on narwhal, bowhead and anadromous Arctic Char abundance, distribution ecology and habitat use.</u></b></li> </ul> </li> <li>g. Enhance baseline data on marine wildlife (fish, invertebrates, birds, mammals, etc.) and to provide more details on species abundance and distribution found in the Project area. This shall include, but not be limited to the following: <ul style="list-style-type: none"> <li>i. Aerial surveys for basking ringed seals throughout</li> </ul> </li> </ul>

	<p>the landfast ice of Steensby Inlet and at <u>an</u> appropriate control location;</p> <p>ii. Shore-based observations of pre-Project narwhal <u>and bowhead whale</u> behavior in Milne Inlet <u>that continues at an appropriate frequency throughout the Early Revenue Phase and for not less than three consecutive years.</u></p> <p>Enhance the baseline for affected freshwater systems, which includes control sites to detect Project-related changes before they cause significant harm.</p>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No. 101</b>	<b>101</b>
<b>Category:</b>	Marine Environment – Monitoring
<b>Responsible Parties:</b>	The Proponent, Marine Environment Working Group
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To monitor for potential impacts to marine wildlife and marine habitat.
<b>Term or Condition:</b>	<p>The Proponent shall incorporate into the appropriate monitoring plans the following items:</p> <ul style="list-style-type: none"> <li>a. A monitoring program that focuses on walrus use of Steensby Inlet and their reaction to disturbance from construction activities, aircraft, and vessels;</li> <li>b. Efforts to involve Inuit in monitoring studies at all levels;</li> <li>c. Monitoring protocols that are responsive to Inuit concerns;</li> <li>d. Marine monitoring protocols are to consider the use of additional detecting devices to ensure adequate monitoring through changing seasonal conditions and daylight;</li> <li>e. Schedule for periodic aerial surveys as recommended by the Marine Environment Working Group;</li> <li>f. Periodic aerial surveys for basking ringed seals throughout the landfast ice of Steensby Inlet, and a suitable control location. Surveys shall be conducted at an appropriate frequency to detect change inter-annual variability;</li> <li>g. Shore-based observations of pre-Project narwhal behavior in Milne Inlet;</li> <li>h. Conduct landfast ice monitoring for the duration of the Project Operations phase, which will include: <ul style="list-style-type: none"> <li>i. The number of ship transits that are able to use the same track; and,</li> <li>ii. The area of landfast ice disrupted annually by ship traffic; and</li> </ul> </li> <li>i. Monitoring strategy focused on assessing and mitigating interaction between humans and wildlife at the port site(s).</li> </ul>



<b>Reporting Requirements:</b>	To be provided in the Annual Report to the NIRB.
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<b>REVISED Term and Condition No. 101</b>	<b>101</b>
<b>Category:</b>	Marine Environment – Monitoring
<b>Responsible Parties:</b>	The Proponent, Marine Environment Working Group
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To monitor for potential impacts to marine wildlife and marine habitat.
<b>Term or Condition:</b>	<p>The Proponent shall incorporate into the appropriate monitoring plans the following items:</p> <ul style="list-style-type: none"> <li>a. A monitoring program that focuses on walrus use of Steensby Inlet and their reaction to disturbance from construction activities, aircraft, and vessels;</li> <li>b. Efforts to involve Inuit in monitoring studies at all levels;</li> <li>c. Monitoring protocols that are responsive to Inuit concerns;</li> <li>d. Marine monitoring protocols are to consider the use of additional detecting devices to ensure adequate monitoring through changing seasonal conditions and daylight;</li> <li>e. Schedule for periodic aerial surveys as recommended by the Marine Environment Working Group;</li> <li>f. Periodic aerial surveys for basking ringed seals throughout the landfast ice of Steensby Inlet, and a suitable control location. Surveys shall be conducted at an appropriate frequency to detect change inter-annual variability;</li> <li>g. Shore-based observations of pre-Project narwhal behavior in Milne Inlet, <b><u>that continues at an appropriate frequency throughout the Early Revenue Phase (not less than three years);</u></b></li> <li>h. Conduct landfast ice monitoring for the duration of the Project Operations phase, which will include: <ul style="list-style-type: none"> <li>i. The number of ship transits that are able to use the same track; and,</li> <li>ii. The area of landfast ice disrupted annually by ship traffic; and</li> <li>iii. Monitoring strategy focused on assessing and mitigating interaction between humans and wildlife at the port site(s).</li> </ul> </li> </ul>
<b>Reporting Requirements:</b>	To be provided in the Annual Report to the NIRB.

<b>ORIGINAL Term and Condition No. 102</b>	<b>102</b>
<b>Category:</b>	Marine Environment – Traffic Log and Shipping Information
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To promote public awareness of Project shipping activities for the general

	public.
<b>Term or Condition:</b>	The Proponent shall ensure that routing of project vessels is tracked and recorded, with data made accessible in real time to communities in Nunavut and Nunavik. A summary of all ship tracks shall be submitted annually to the NIRB.
<b>Reporting Requirements:</b>	To be provided in the Annual Report to the NIRB.

<b>REVISED Term and Condition No. 102</b>	<b>102</b>
<b>Category:</b>	Marine Environment – Traffic Log and Shipping Information
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To promote public awareness of Project shipping activities for the general public.
<b>Term or Condition:</b>	The Proponent shall ensure that routing of project vessels is tracked and recorded <b>for both the southern and northern shipping routes</b> , with data made accessible in real time to communities in Nunavut and Nunavik. <del>A summary of all ship tracks shall be submitted annually to the NIRB.</del>
<b>Reporting Requirements:</b>	To be provided in the Annual Report to the NIRB.

<b>ORIGINAL Term and Condition No. 104</b>	<b>104</b>
<b>Category:</b>	Marine Environment – Traffic Log and Shipping Information
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations
<b>Objective:</b>	To prevent impacts to marine wildlife from Project shipping activities.
<b>Term or Condition:</b>	Subject to safety considerations and the potential for conditions as determined by the crew of transiting vessels, to result in route deviations, the Proponent shall require project vessels to maintain a route to the south of Mill Island to prevent disturbance to walrus and walrus habitat on the northern shore of Mill Island. Where project vessels are required to transit to the north of Mill Island owing to environmental or other conditions, an incident report is to be provided to the Marine Environment Working Group and the NIRB within 30 days, noting all wildlife sightings and interactions as recorded by shipboard monitors. The Proponent shall summarize all incidences of deviations from the nominal shipping route as presented in the FEIS to the NIRB annually, with corresponding discussion regarding justification for deviations and any observed environmental impacts.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No. 104</b>	<b>104</b>

<b>Category:</b>	Marine Environment – Traffic Log and Shipping Information
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations
<b>Objective:</b>	To prevent impacts to marine wildlife from Project shipping activities.
<b>Term or Condition:</b>	<p>Subject to safety considerations and the potential for conditions as determined by the crew of transiting vessels, to result in route deviations,</p> <ol style="list-style-type: none"> <li>the Proponent shall require, <b>for shipping to/from Steensby Port</b>, project vessels to maintain a route to the south of Mill Island to prevent disturbance to walrus and walrus habitat on the northern shore of Mill Island. Where project vessels are required to transit to the north of Mill Island owing to environmental or other conditions, an incident report is to be provided to the Marine Environment Working Group and the NIRB within 30 days, noting all wildlife sightings and interactions as recorded by shipboard monitors.</li> <li>The Proponent shall summarize all incidences of <b>significant</b> deviations from the nominal shipping routes <b>for traffic to/from Milne Port and Steensby Port</b> as presented in the FEIS and <b>FEIS Addendum</b> to the NIRB annually, with corresponding discussion regarding justification for deviations and any observed environmental impacts.</li> </ol>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No. 105</b>	<b>105</b>
<b>Category:</b>	Marine Environment – Traffic Log and Shipping Information
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To prevent impacts to marine wildlife from Project shipping activities.
<b>Term or Condition:</b>	<p>The Proponent shall ensure that measures to reduce the potential for interaction with marine mammals, particularly in Hudson Strait, are identified and implemented prior to commencement of shipping operations. These measures could include, but are not limited to:</p> <ol style="list-style-type: none"> <li>Changes in the frequency and timing (including periodic suspensions) of shipping during winter months, i.e., when interactions with marine mammals are likely to be the most problematic;</li> <li>Reduced shipping speeds where ship-marine mammal interactions are most likely; and</li> <li>Identification of alternate shipping routes through Hudson Strait for use when conflicts between the proposed routes and marine mammals could arise. Repeated winter aerial survey results showing marine mammal distribution and densities in Hudson Strait would greatly assist in this task.</li> </ol>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No. 105</b>	<b>105</b>
<b>Category:</b>	Marine Environment – Traffic Log and Shipping Information
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To prevent impacts to marine wildlife from Project shipping activities.
<b>Term or Condition:</b>	<p>The Proponent shall ensure that measures to reduce the potential for interaction with marine mammals, particularly in Hudson Strait <b><u>and Milne Inlet</u></b>, are identified and implemented prior to commencement of shipping operations. These measures could include, but are not limited to:</p> <ul style="list-style-type: none"> <li>a. Changes in the frequency and timing (including periodic suspensions) of shipping during winter months <b><u>in Hudson Strait and during the open water season in Milne Inlet</u></b>, i.e., when interactions with marine mammals are likely to be the most problematic;</li> <li>b. Reduced shipping speeds where ship-marine mammal interactions are most likely; and</li> <li>c. Identification of alternate shipping routes through Hudson Strait for use when conflicts between the proposed routes and marine mammals could arise. Repeated winter aerial survey results showing marine mammal distribution and densities in Hudson Strait would greatly assist in this task.</li> </ul>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No. 106</b>	<b>106</b>
<b>Category:</b>	Marine Environment – Shipboard Observers
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To ensure that interactions with marine mammals and Project shipping activities are effectively monitored.
<b>Term or Condition:</b>	The Proponent shall ensure that shipboard observers are employed through all seasons and provided with the means to effectively carry out assigned duties. The role of shipboard observers in shipping operations should be taken into consideration during the design of ore carriers, with climate controlled stations and shipboard lighting incorporated to permit visual sightings by shipboard observers during all seasons and conditions.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No. 106</b>	<b>106</b>
<b>Category:</b>	Marine Environment – Shipboard Observers
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To ensure that interactions with marine mammals and Project shipping activities are effectively monitored.
<b>Term or Condition:</b>	The Proponent shall ensure that shipboard observers are employed <del>through all seasons</del> <b>during seasons where shipping occurs</b> and provided with the means to effectively carry out assigned duties. The role of shipboard observers in shipping operations should be taken into consideration during the design of <b>any</b> ore carriers <b>purpose-built for the Project</b> , with climate controlled stations and shipboard lighting incorporated to permit visual sightings by shipboard observers during all seasons and conditions.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>Original Term and Condition No. 107</b>	<b>107</b>
<b>Category:</b>	Marine Environment – Shipboard Observers
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To ensure that interactions with marine mammals are effectively monitored for.
<b>Term or Condition:</b>	The Proponent shall revise the proposed “surveillance monitoring” to improve the likelihood of detecting strong marine mammal responses occurring too far ahead of the ship to be detectable by observers aboard the ore carriers. A baseline study early in the shipping operations could employ additional surveillance to detect potential changes in distribution patterns and behavior. At an ambitious scope, this might be achieved using unmanned aircraft flown well ahead of ships, or over haul-out sites in the case of walruses.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No. 107</b>	<b>107</b>
<b>Category:</b>	Marine Environment – Shipboard Observers
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, <b>Operations</b>
<b>Objective:</b>	To <b>determine the presence of, and</b> ensure that interactions with marine mammals, <b>seabirds and seaducks</b> are effectively monitored for, <b>along the northern and southern shipping routes, as applicable.</b>

<b>Term or Condition:</b>	The Proponent shall revise the proposed “surveillance monitoring” to improve the likelihood of detecting strong marine mammal, <u>seabird or seaduck</u> responses occurring too far ahead of the ship to be detectable by observers aboard the ore carriers. A baseline study early in the shipping operations could employ additional surveillance to detect potential changes in distribution patterns and behavior. At an ambitious scope, this might be achieved using unmanned aircraft flown well ahead of ships, or <u>over known areas of importance for seabirds or</u> haul-out sites in the case of walruses.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>Original Term and Condition No. 108</b>	<b>108</b>
<b>Category:</b>	Marine Environment – Shipboard Observers
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations
<b>Objective:</b>	To ensure that interactions with marine mammals are effectively monitored for.
<b>Term or Condition:</b>	The Proponent shall ensure that data produced by the surveillance monitoring program is analysed rigorously by experienced analysts (in addition to being discussed as proposed in the FEIS) to maximize their effectiveness in providing baseline information, and for detecting potential effects of the project on marine mammals in the Regional Study Area. It is expected that data from the long-term monitoring program be treated with the same rigor.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No. 108</b>	<b>108</b>
<b>Category:</b>	Marine Environment – Shipboard Observers
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations
<b>Objective:</b>	To ensure that interactions with marine mammals, <u>seabirds, and seaducks</u> are effectively monitored for <u>along the southern and northern shipping routes, as applicable.</u>
<b>Term or Condition:</b>	The Proponent shall ensure that data produced by the surveillance monitoring program is analysed rigorously by experienced analysts (in addition to being discussed as proposed in the FEIS) to maximize their effectiveness in providing baseline information, and for detecting potential effects of the project on marine mammals, <u>seabirds and seaducks</u> in the Regional Study Area. It is expected that data from the long-term monitoring program be treated with the same rigor.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No. 109</b>	<b>109</b>
<b>Category:</b>	Marine Environment – Ship Noise
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To prevent impacts to marine mammals from Project shipping activities.
<b>Term or Condition:</b>	The Proponent shall conduct a monitoring program to confirm the predictions in the FEIS with respect to disturbance effects from ships noise on the distribution and occurrence of marine mammals. The survey shall be designed to address effects during all seasons of the year, and include locations in Hudson Strait and Foxe Basin. The survey shall continue over a sufficiently lengthy period to determine the extent to which acclimation occurs for narwhal, beluga, bowhead and walrus.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No. 109</b>	<b>109</b>
<b>Category:</b>	Marine Environment – Ship Noise
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To prevent impacts to marine mammals from Project shipping activities.
<b>Term or Condition:</b>	The Proponent shall conduct a monitoring program to confirm the predictions in the FEIS with respect to disturbance effects from ships noise on the distribution and occurrence of marine mammals. The survey shall be designed to address effects during <u>the shipping</u> <del>all seasons of the year</del> , and include locations in Hudson Strait and Foxe Basin, <u>Milne Inlet, Eclipse Sound and Pond Inlet</u> . The survey shall continue over a sufficiently lengthy period to determine the extent to which <u>habituation</u> <del>acclimation</del> occurs for narwhal, beluga, bowhead and walrus.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No. 110</b>	<b>110</b>
<b>Category:</b>	Marine Environment – Ship Noise
<b>Responsible Parties:</b>	The Proponent, Marine Environment Working Group
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To prevent impacts to marine mammals from Project shipping activities.
<b>Term or Condition:</b>	The Proponent shall develop a monitoring protocol that includes, but is not limited to, acoustical monitoring, to facilitate assessment of the potential short term, long term, and cumulative effects of vessel noise on marine mammals and marine mammal populations. The Proponent is expected to

	work with the Marine Environment Working Group to determine appropriate early warning indicator(s) that will ensure rapid identification of negative impacts.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No. 110</b>	<b>110</b>
<b>Category:</b>	Marine Environment – Ship Noise
<b>Responsible Parties:</b>	The Proponent, Marine Environment Working Group
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To prevent impacts to marine mammals from Project shipping activities.
<b>Term or Condition:</b>	The Proponent shall <b>immediately</b> develop a monitoring protocol that includes, but is not limited to, acoustical monitoring, to facilitate assessment of the potential short term, long term, and cumulative effects of vessel noise on marine mammals and marine mammal populations. The Proponent is expected to work with the Marine Environment Working Group to determine appropriate early warning indicator(s) that will ensure rapid identification of negative impacts <b><u>along the southern and northern shipping routes.</u></b>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No. 113</b>	<b>113</b>
<b>Category:</b>	Marine Environment – Arctic Char
<b>Responsible Parties:</b>	The Proponent, Marine Environment Working Group
<b>Project Phase:</b>	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To prevent impacts to marine fish in Steensby Inlet.
<b>Term or Condition:</b>	The Proponent shall conduct monitoring of marine fish and fish habitat, which includes but is not limited to, monitoring for Arctic Char stock size and health condition in Steensby Inlet, as recommended by the Marine Environment Working Group.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No. 113</b>	<b>113</b>
<b>Category:</b>	Marine Environment – Arctic Char
<b>Responsible Parties:</b>	The Proponent, Marine Environment Working Group
<b>Project Phase:</b>	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring



<b>Objective:</b>	To prevent impacts to marine fish in Steensby Inlet.
<b>Term or Condition:</b>	The Proponent shall conduct monitoring of marine fish and fish habitat, which includes but is not limited to, monitoring for Arctic Char stock size and health condition in Steensby Inlet <b>and Milne Inlet</b> , as recommended by the Marine Environment Working Group.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No. 114</b>	<b>114</b>
<b>Category:</b>	Marine Environment – Arctic Char
<b>Responsible Parties:</b>	The Proponent, Marine Environment Working Group
<b>Project Phase:</b>	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To prevent impacts to marine fish in Steensby Inlet.
<b>Term or Condition:</b>	In the event of the development of a commercial fishery in the Steensby Inlet area, the Proponent, in conjunction with the Marine Environment Working Group, shall update its monitoring program for marine fish and fish habitat to ensure that the ability to identify Arctic Char stock(s) potentially affected by Project activities and monitor for changes in stock size and structure of affected stocks and fish health (condition, taste) is maintained.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No. 114</b>	<b>114</b>
<b>Category:</b>	Marine Environment – Arctic Char
<b>Responsible Parties:</b>	The Proponent, Marine Environment Working Group
<b>Project Phase:</b>	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To prevent impacts to marine fish in Steensby Inlet.
<b>Term or Condition:</b>	In the event of the development of a commercial fishery in the Steensby Inlet area <b>or Milne Inlet-Eclipse Sound areas</b> , the Proponent, in conjunction with the Marine Environment Working Group, shall update its monitoring program for marine fish and fish habitat to ensure that the ability to identify Arctic Char stock(s) potentially affected by Project activities and monitor for changes in stock size and structure of affected stocks and fish health (condition, taste) is maintained <b>to address any additional monitoring issues identified by the MEWG relating to the commercial fishery.</b>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and</b>	<b>115</b>
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<b>Condition No. 115</b>	
<b>Category:</b>	Marine Environment – Arctic Char
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To prevent impacts to marine fish in Steensby Inlet.
<b>Term or Condition:</b>	The Proponent is encouraged to continue to explore off-setting options in both the freshwater and marine environment to offset the Harmful Alteration, Disruption or Destruction of Fish and Fish Habitat (HADD).
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No. 115</b>	<b>115</b>
<b>Category:</b>	Marine Environment – Arctic Char
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To prevent impacts to marine fish in Steensby Inlet.
<b>Term or Condition:</b>	The Proponent is encouraged to continue to explore off-setting options in both the freshwater and marine environment to offset the <b><u>serious harm to fish which will result from the construction and infrastructure associated with the Project.</u></b> <del>Harmful Alteration, Disruption or Destruction of Fish and Fish Habitat (HADD)</del>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No.</b>	<b>116</b>
<b>Category:</b>	Marine Environment – Blasting
<b>Responsible Parties:</b>	The Proponent, Fisheries and Oceans Canada
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To prevent impacts to marine fish and fish habitat from explosives.
<b>Term or Condition:</b>	Prior to construction, the Proponent shall develop additional mitigation measures to minimize the effects of blasting on marine fish and fish habitat, marine water quality and wildlife that includes, but is not limited to compliance with the Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky, 1998) as modified by Fisheries and Oceans Canada for use in the North.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No.</b>	<b>116</b>
<b>Category:</b>	Marine Environment – Blasting

<b>Responsible Parties:</b>	The Proponent, Fisheries and Oceans Canada
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To prevent impacts to marine fish and fish habitat from explosives.
<b>Term or Condition:</b>	Prior to construction, the Proponent shall develop <del>additional</del> mitigation measures to minimize the effects of blasting on marine fish and fish habitat, marine water quality and wildlife that includes, but is not limited to compliance with the Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky, 1998) as modified by Fisheries and Oceans Canada for use in the North <u>and as revised from time to time.</u>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>ORIGINAL Term and Condition No. 125</b>	<b>125</b>
<b>Category:</b>	Marine Environment – Public Engagement
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To assess acceptability of acoustic deterrent devices for the general public.
<b>Term or Condition:</b>	Prior to use of acoustic deterrent devices, the Proponent shall carry out consultations with communities along the shipping route to assess the acceptability of these devices. Feedback received from community consultations shall be incorporated into the appropriate mitigation plan.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No. 125</b>	<b>125</b>
<b>Category:</b>	Marine Environment – Public Engagement
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To assess acceptability of acoustic deterrent devices for the general public.
<b>Term or Condition:</b>	Prior to use of acoustic deterrent devices, the Proponent shall carry out consultations with communities along the shipping routes <u>and nearest to Steensby Inlet and Milne Inlet ports</u> to assess the acceptability of these devices. Feedback received from community consultations shall be incorporated into the appropriate mitigation plan.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>NEW Term and Condition No.</b>	<b>125 (a)</b>

<b>Category:</b>	Marine Environment – Public Engagement
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	To ensure public acceptability of project vessel anchor sites and reduce potential conflicts between project marine shipping and local harvesting.
<b>Term or Condition:</b>	The Proponent shall consult with potentially-affected communities and groups, particularly Hunters’ and Trappers’ Organizations regarding the identification of project vessel anchor sites and potential areas of temporary refuge for project vessels along the shipping routes within the Nunavut Settlement Area. Feedback received from community consultations shall be incorporated into the most appropriate mitigation or management plans.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

## SOCIO-ECONOMIC TERMS AND CONDITIONS

### 8.5.13 Education and Training

*Note: Terms and conditions 135 through 141 of the existing Project Certificate address potential impacts to Livelihood and Employment, and all of these should apply to the ERP. The Board has not identified any new terms and conditions to be added to this section.*

### 8.5.14 Livelihood and Employment

*Note: Terms and conditions 142 through 149 of the existing Project Certificate address potential impacts to Livelihood and Employment, and all of these should apply to the ERP. The Board has not identified any new terms and conditions to be added to this section.*

<b>Term and Condition No.</b>	<b>139</b>
<b>Category:</b>	Education and Training – Hiring southern Canadians and foreign employees
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	With the unknown availability of labour from the North Baffin region and Nunavut as a whole to provide employment to the Project, the need to employ southern Canadians or foreign workers may implicate the Proponent’s on-site language, cross-cultural awareness, and other programming. Having information available regarding the sourcing of labour for the Project is important to ensuring the Proponent and others are prepared for any influx of southern or foreign employees.
<b>Term or Condition:</b>	Prior to commencing construction, the Proponent is requested to undertake and provide the results of a detailed labour market analysis which provides quantitative predictions of the number of employees that may reasonably need to be sourced from southern Canada and from foreign markets,

	identifying where applicable, the country of origin for the foreign labour. <b><u>Within 90 days of the issuance of the Project Certificate, the Proponent is required to submit an updated Labour Market Analysis which considers requirements of ERP as well as hiring points within Nunavut and outside of the North Baffin region and RSA.</u></b>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister

### 8.5.15 Economic Development and Self-reliance, and Contracting and Business Opportunities

<b>ORIGINAL Term and Condition No. 149</b>	<b>149</b>
<b>Category:</b>	Economic Development and Self-Reliance, and Contracting and Business Opportunities – Impacts of temporary closure
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To further the understanding of how a temporary closure may impact on the well-being of the residents and businesses of the North Baffin region.
<b>Term or Condition:</b>	Prior to the commencement of operations, the Proponent is required to undertake an analysis of the risk of temporary mine closure, giving consideration to how communities in the North Baffin region may be affected by temporary and permanent closure of the mine, including economic, social and cultural effects.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister

<b>REVISED Term and Condition No. 149</b>	<b>149</b>
<b>Category:</b>	Economic Development and Self-Reliance, and Contracting and Business Opportunities – Impacts of temporary closure
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction
<b>Objective:</b>	To further the understanding of how a temporary closure may impact on the well-being of the residents and businesses of the North Baffin region.
<b>Term or Condition:</b>	Prior to the commencement of operations, the Proponent is required to undertake an analysis of the risk of temporary mine closure, giving consideration to how communities in the North Baffin region may be affected by temporary and permanent closure of the mine, including economic, social and cultural effects <b><u>and taking into consideration the potential drop in employment between the construction and operations phases of the Project.</u></b>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister

<b>ORIGINAL Term and Condition No. 150</b>	<b>150</b>
<b>Category:</b>	Economic Development and Self-Reliance, and Contracting and Business Opportunities – Impacts to visitors of Sirmilik National Park
<b>Responsible Parties:</b>	The Proponent, Parks Canada
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To limit potential of Project impacts upon visitors, researchers and/or beneficiary users of the Sirmilik National Park.
<b>Term or Condition:</b>	<p>The Proponent will ensure the following:</p> <ul style="list-style-type: none"> <li>a. The Proponent will maintain, where possible, a minimum flying altitude of 2,000 feet over the park, except for approaches to land, take-off or for safety reasons.</li> <li>b. The Proponent will ensure that certification of noise compliance is current, where compliance is applicable.</li> <li>c. The Proponent is encouraged to provide Parks Canada with regular flight and shipping schedules that can be used to brief Park visitors.</li> <li>d. The Proponent is strongly encouraged to provide due consideration to wilderness experience during its operations in the open water season, especially during the month of August which is typically a time of high use by sea kayakers.</li> </ul>
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

<b>REVISED Term and Condition No. 150</b>	<b>150</b>
<b>Category:</b>	Economic Development and Self-Reliance, and Contracting and Business Opportunities – Impacts to visitors of Sirmilik National Park
<b>Responsible Parties:</b>	The Proponent, Parks Canada
<b>Project Phase:</b>	Construction and Operations
<b>Objective:</b>	To limit potential of Project impacts upon visitors, researchers and/or beneficiary users of the Sirmilik National Park.
<b>Term or Condition:</b>	<p>The Proponent will ensure the following:</p> <ul style="list-style-type: none"> <li>a. The Proponent will maintain, where possible, a minimum flying altitude of 2,000 feet over the park, except for approaches to land, take-off or for safety reasons.</li> <li>b. The Proponent will ensure that certification of noise compliance is current, where compliance is applicable.</li> <li>c. <del>The Proponent is encouraged to provide Parks Canada with regular flight and shipping schedules that can be used to brief Park visitors.</del> <b><u>For the purpose of briefing Park visitors, the Proponent will provide Parks Canada (1) prior to commencing the shipping season, with planned daily shipping schedules, and (2) annually, with air traffic information, and (3) to provide updates when significant variations from these are expected.</u></b></li> </ul>

	d. The Proponent is strongly encouraged to provide due consideration to wilderness experience during its operations in the open water season, especially during the month of August which is typically a time of high use by sea kayakers.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister.

### 8.5.16 Human Health

**Note: Terms and conditions 153 through 157 of the existing Project Certificate address potential impacts to Human Health, and all of these should apply to the ERP. The Board has not identified any new terms and conditions to be added to this section.**

### 8.5.17 Culture, Resources and Land Use

<b>ORIGINAL Term and Condition No. 164</b>	<b>164</b>
<b>Category:</b>	Socio-Economic Impacts – Shipping notification
<b>Responsible Parties:</b>	The Proponent, Elders and community members of the North Baffin communities
<b>Project Phase:</b>	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
<b>Objective:</b>	In order to inform members of North Baffin communities of planned Project shipping transits such that community members' planned travel routing may be adjusted to avoid interaction with Project ships and/or ship tracks.
<b>Term or Condition:</b>	The Proponent is required to provide notification to communities regarding scheduled ship transits throughout the regional study area, real-time data regarding ships in transit and any changes to the proposed shipping schedule.
<b>Reporting Requirements:</b>	The information required shall be provided on a monthly basis at a minimum or more often as the Proponent determines necessary and is to be provided to the Proponent's community liaison officers and those of the Qikiqtani Inuit Association as well as the Hunters and Trappers Organizations and Hamlet organizations of the North Baffin communities, Coral Harbour, and the NIRB's Monitoring Officer. Where deviations from the proposed schedule or routing are required, this information shall be provided as soon as possible.

<b>REVISED Term and Condition No. 164</b>	<b>164</b>
<b>Category:</b>	Socio-Economic Impacts – Shipping notification
<b>Responsible Parties:</b>	The Proponent, Elders and community members of the North Baffin communities
<b>Project Phase:</b>	Construction, Operations, Temporary Closure / Care and Maintenance,

	Closure and Post-Closure Monitoring
<b>Objective:</b>	In order to inform members of North Baffin communities of planned Project shipping transits such that community members' planned travel routing may be adjusted to avoid interaction with Project ships and/or ship tracks.
<b>Term or Condition:</b>	The Proponent is required to provide notification to communities regarding scheduled ship transits throughout the regional study area <b><u>including Eclipse Sound and Milne Inlet</u></b> , real-time data regarding ships in transit and any changes to the proposed shipping schedule <b><u>to the MEWG and agencies within Pond Inlet on a weekly basis during open water shipping, and to the RSA communities on a monthly basis.</u></b>
<b>Reporting Requirements:</b>	The information required shall be provided on a monthly basis at a minimum or more often as the Proponent determines necessary and is to be provided to the Proponent's community liaison officers and those of the Qikiqtani Inuit Association as well as the Hunters and Trappers Organizations and Hamlet organizations of the North Baffin communities, Coral Harbour, and the NIRB's Monitoring Officer. Where deviations from the proposed schedule or routing are required, this information shall be provided as soon as possible.

## 8.5.18 Accidents and Malfunctions

<b>Original Term and Condition No. 171</b>	<b>171</b>
<b>Category:</b>	Accidents and Malfunctions – Terrestrial Wildlife Management and Monitoring Plan
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Pre-Construction
<b>Objective:</b>	Updates to plan in order to minimize potential for caribou-railway interactions.
<b>Term or Condition:</b>	The Proponent shall include within its updated Terrestrial Wildlife Management and Monitoring Plan, a commitment to establish deterrents along the railway embankment at any areas where it is determined that caribou are utilizing the embankment to facilitate movement and where such movement presents a likelihood of caribou mortality to occur.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister

<b>REVISED Term and Condition No. 171</b>	<b>171</b>
<b>Category:</b>	Accidents and Malfunctions – Terrestrial Wildlife Management and Monitoring Plan
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Pre-Construction
<b>Objective:</b>	Updates to plan in order to minimize potential for caribou-railway



	interactions.
<b>Term or Condition:</b>	The Proponent shall include within its updated Terrestrial Wildlife Management and Monitoring Plan, a commitment to establish deterrents along the railway embankment at any areas where it is determined that caribou are utilizing the embankment <u>and Tote Road</u> to facilitate movement and where such movement presents a likelihood of caribou mortality to occur.
<b>Reporting Requirements:</b>	To be developed following approval of the Project by the Minister

<b>Original Term and Condition No. 173</b>	<b>173</b>
<b>Category:</b>	Accidents and Malfunctions – Use of containment booms
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations, Closure
<b>Objective:</b>	To provide additional spill contingency measures for spills in marine areas.
<b>Term or Condition:</b>	The Proponent shall employ full containment booms during all ship-to-shore and other marine-based fuel transfer events.
<b>Reporting Requirements:</b>	To be determined following approval of the Project by the Minister

<b>REVISED Term and Condition No. 173</b>	<b>173</b>
<b>Category:</b>	Accidents and Malfunctions – Use of containment booms
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Construction, Operations, Closure
<b>Objective:</b>	To provide additional spill contingency measures for spills in marine areas.
<b>Term or Condition:</b>	The Proponent shall employ <u>best practices and meet all regulatory requirements</u> during all ship-to-shore and other marine-based fuel transfer events.
<b>Reporting Requirements:</b>	To be determined following approval of the Project by the Minister

<b>Original Term and Condition No. 176</b>	<b>176</b>
<b>Category:</b>	Accidents and Malfunctions – Revised spill modeling
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Pre-Construction, Construction Operations, Closure
<b>Objective:</b>	To improve community ability to assist in spill response.
<b>Term or Condition:</b>	The Proponent is required to revise its spill planning to include additional trajectory modeling for areas of Hudson Strait, such as Mill Island, where walrus concentrate, as well as for mid-Hudson Strait during winter conditions.
<b>Reporting Requirements:</b>	The updated modeling shall be provided to the NIRB and to Fisheries and

	Oceans Canada for review at least 3 months prior shipment of bulk fuel to Steensby Inlet.
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<b>REVISED Term and Condition No. 176</b>	<b>176</b>
<b>Category:</b>	Accidents and Malfunctions – Revised spill modeling
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Pre-Construction, Construction Operations, Closure
<b>Objective:</b>	To improve community ability to assist in spill response.
<b>Term or Condition:</b>	The Proponent is required to revise its spill planning to include additional trajectory modeling for areas of Hudson Strait, such as Mill Island, where walrus concentrate, as well as for mid-Hudson Strait during winter conditions <b>as well as for the northern shipping route, including Milne Inlet, Eclipse Sound and Pond Inlet.</b>
<b>Reporting Requirements:</b>	The updated modeling shall be provided to the NIRB, Fisheries and Oceans Canada, <b>and Environment Canada</b> for review at least 3 months prior shipment of bulk fuel to Steensby Inlet <b>or Milne Inlet.</b>

### 8.5.19 Cumulative Effects

<b>NEW Term and Condition No. 179 (c)</b>	<b>179(c)</b>
<b>Category:</b>	Cumulative Effects
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Operations
<b>Objective:</b>	Mitigating the cumulative effect of the Early Revenue Phase Proposal when combined with the Approved Project on the capacity of the reserves associated with Deposit #1
<b>Term or Condition:</b>	When mining commences under both the Approved Project and the Early Revenue Phase Proposal, the total volume of ore mined from Deposit #1 in any given calendar year shall not exceed 18 million tonnes.
<b>Reporting Requirements:</b>	For each year after the Proponent commences mining of Deposit #1, the Proponent shall include, in the Annual Report to the NIRB, a summary of the total amount of ore mined from Deposit #1 for the previous calendar year.

### 8.5.20 Operational Variability/Flexibility

<b>NEW Term and Condition No. 179 (a)</b>	<b>179 (a)</b>
<b>Category:</b>	Operational Variability/Flexibility

<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Operations
<b>Objective:</b>	To ensure that there are appropriate limits on the Early Revenue Phase Proposal marine shipping component in order to limit and manage likely project effects, while balancing the need for operational flexibility.
<b>Term or Condition:</b>	In any given calendar year, the total volume of ore shipped via Milne Inlet, shall not exceed 4.2 million tonnes.
<b>Reporting Requirements:</b>	For each year after the Proponent commences shipping ore via Milne Inlet under the Early Revenue Phase Proposal, the Proponent shall include in the Annual Report to the NIRB, a summary of the total amount of ore shipped via Milne Inlet for the previous calendar year.

<b>NEW Term and Condition No. 179 (b)</b>	<b>179 (b)</b>
<b>Category:</b>	Operational Variability/Flexibility
<b>Responsible Parties:</b>	The Proponent
<b>Project Phase:</b>	Operations
<b>Objective:</b>	To ensure that there are appropriate limits on the Early Revenue Phase Proposal project land transportation component in order to limit and manage likely project effects, while balancing the need for operational flexibility.
<b>Term or Condition:</b>	In any given calendar year, the total volume of ore transported by truck on the Milne Inlet Tote Road shall not exceed 4.2 million tonnes.
<b>Reporting Requirements:</b>	For each year after the Proponent commences transportation of ore via the Tote Road under the Early Revenue Phase Proposal, the Proponent shall include in the Annual Report to the NIRB, a summary of the total amount of ore shipped via the Tote Road for the previous calendar year.

**APPENDIX A: NIRB Contribution to the NPC/NIRB Joint Review  
of the Transportation Corridor Component under the North  
Baffin Regional Land Use Plan**



**NIRB File No.: 08MN053**

February 24, 2014

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Nunavut Planning Commission  
P.O. Box 2101  
Cambridge Bay, NU X0B 0C0

Sent via email: [pkabloona@nunavut.ca](mailto:pkabloona@nunavut.ca)

**Re: NIRB Contribution to the NPC/NIRB Joint Review of the NBRLUP Transportation Corridor Application for Baffinland Iron Mines Corporation's "Early Revenue Phase" proposal**

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Dear Percy Kabloona:

Please find enclosed a summary report provided by the Nunavut Impact Review Board (NIRB) to the Nunavut Planning Commission (NPC) to outline information relevant for the NPC's consideration of the North Baffin Regional Land Use Plan (NBRLUP) transportation corridor application associated with Baffinland Iron Mines Corporation's (BIMC or Proponent) Early Revenue Phase Proposal. This information has been collected through the NIRB's reconsideration of the terms and conditions of Project Certificate 005 associated with Baffinland's Mary River Project (NIRB File No. 08MN053), pursuant to section 12.8.2 of the Nunavut Land Claims Agreement (NLCA).

All documentation associated with the NIRB's reconsideration of the terms and conditions of Project Certificate 005 can be accessed online from the NIRB's public registry at the following location:

<http://ftp.nirb.ca/03-MONITORING/08MN053-MARY%20RIVER%20IRON%20MINE/01-PROJECT%20CERTIFICATE/04-AMENDMENTS/ERP/>

This summary report is not offered as, nor should it be construed as an indication or other form of decision by the NIRB regarding the acceptability of the transportation corridor application for the Early Revenue Phase Proposal. Further, this summary report is not indicative of the ultimate disposition of the NIRB's reconsideration process for the terms and conditions of Project Certificate 005 under NLCA s. 12.8.2, which will be reported directly to the relevant Minister in a decision report in the near future.

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If you have any questions regarding the enclosed report, please contact Ryan Barry, NIRB Executive Director at (867) 983-4608 or via email at [rbarry@nirb.ca](mailto:rbarry@nirb.ca).

Sincerely,



Elizabeth Copland  
Chairperson  
Nunavut Impact Review Board

cc: The Honourable Bernard Valcourt, Minister of Aboriginal Affairs and Northern Development  
Erik Madsen, Baffinland Iron Mines Corporation  
Sharon Ehaloak, Nunavut Planning Commission  
Mary River Distribution List

Enclosed: NIRB Contribution to the NPC/NIRB Joint Review of the NBRLUP Transportation Corridor  
Application for Baffinland Iron Mines Corporation's "Early Revenue Phase" proposal



# **NIRB Contribution to the NPC/NIRB Joint Review of the Transportation Corridor Application under the North Baffin Regional Land Use Plan for Baffinland Iron Mines Corporation's "Early Revenue Phase" Proposal**

## ***Overview***

This summary has been provided to the Nunavut Planning Commission (NPC) to outline information relevant for the NPC's consideration of the North Baffin Regional Land Use Plan (NBRLUP) transportation corridor application associated with Baffinland Iron Mines Corporation's (BIMC or Proponent) Early Revenue Phase (ERP) Proposal. This information has been collected through the Nunavut Impact Review Board's (NIRB) reconsideration of the terms and conditions of Project Certificate No.: 005 associated with Baffinland's Mary River Project (NIRB File No.: 08MN053), pursuant to Article 12, Section 12.8.2 of the Nunavut Land Claims Agreement (NLCA).

Recognizing that the NPC has the expertise to consider the land use planning aspects of the transportation corridor application and is the authority established under the NLCA with jurisdiction to consider the transportation corridor application, the sole focus of the NIRB summary is on the ecosystemic and socio-economic issues that may be linked to the transportation corridor application that were identified during the course of the NIRB's reconsideration of Project Certificate No.: 005. This summary is not offered as, nor should it be construed as an indication or other form of decision by the NIRB regarding the acceptability of the transportation corridor application for the ERP Proposal. Further, this summary is not indicative of the ultimate disposition of the NIRB's reconsideration process for the terms and conditions of Project Certificate No.: 005 under NLCA Article 12, Section 12.8.2, which will be reported directly to the relevant Minister in a decision report in the near future.

## ***Procedural History***

On February 7, 2013 in correspondence to the NIRB, the NPC confirmed that the routing of ore shipments along the Milne Inlet Tote Road (Tote Road) proposed by BIMC in the ERP Proposal was not included in the NPC's positive conformity determination for the original Mary River Project issued by the NPC on April 30, 2008 (NIRB File No.: 08MN053). On this basis, the NPC indicated that a new conformity determination was required by the NPC for the development option proposed in the ERP. In response, the NIRB confirmed on February 12, 2013 that the NPC conformity determination constituted a key precondition to the NIRB's initiation of the Board's internal review process of BIMC's Final Environmental Impact Assessment Addendum (FEIS Addendum).



On June 24, 2013, the NPC received an application from Fisheries and Oceans Canada requesting a conformity determination for Baffinland's ERP proposal, with the ERP Proposal (FEIS Addendum) also provided for the NPC's consideration. On August 6, 2013, the NPC requested that BIMC make an application for the development of a transportation corridor under Section 3.5.11 of the NBRLUP. BIMC submitted the requested application for an amendment to the NBRLUP for the development of a transportation corridor to the NPC on August 9, 2013. On August 13, 2013 the NPC forwarded Baffinland's application to amend the NBRLUP to the NIRB for reference.

On August 13, 2013 the NPC issued a conditional conformity determination for the ERP Proposal advising the Proponent that pursuant to Section 3.5.12 of the NBRLUP, a joint review process was required to be conducted between the NPC and the NIRB which would address the development of the transportation corridor associated with the ERP Proposal. NPC directed that as the ERP seeks to amend the approved Mary River project by incorporating, among other activities, increased usage of the existing Milne Inlet Tote Road and shipping through a port at Milne Inlet during the open water season to allow for transport of up to 3.5 million tons of iron ore each year, the ERP triggered the requirement for an application and joint NPC-NIRB review of the transportation corridor under the NBRLUP.

On August 15, 2013, having received the NPC's conditional conformity determination, the NIRB commenced the technical review period for the ERP. During the technical review period, on September 23, 2013 the NIRB issued a specific invitation for parties to provide technical review comments to address whether the requirements of NBRLUP Appendix K had been met by BIMC's FEIS Addendum and NBRLUP application. Specifically parties were asked to comment on the following aspects of the proposed transportation corridor:

- Acceptability of the corridor width;
- Proposed measures for mitigation of potential adverse impacts; and
- Likelihood of maximizing access to other resources while minimizing the overall footprint.

Following the October 18, 2013 deadline for receiving technical review comments, the NIRB identified comments regarding the information requirements of Appendix K of the NBRLUP in the submissions of:

- Aboriginal Affairs and Northern Development Canada;
- Parks Canada; and
- Transport Canada.

On November 14, 2013 the NIRB forwarded the relevant technical review comments to the NPC for its consideration. On November 18, 2013 the NPC issued public notice of oral hearings to be held in





January 2014 by NPC in the communities of Clyde River, Grise Fiord, Resolute Bay, Arctic Bay and Pond Inlet for the purpose of soliciting feedback to be considered by the NPC to determine whether to recommend an amendment to the NBRLUP to allow the proposed transportation corridor to proceed. On November 26, 2013 the NIRB confirmed that although the Board would not be participating directly in the NPC's oral hearings, the NIRB would continue to participate in the joint review by providing the NPC with its input regarding the transportation corridor application as facilitated through the NIRB's ongoing assessment of the ERP Proposal.

On November 26-27, 2013 the NPC attended the meeting of technical experts facilitated by the NIRB as the next step in the Board's Section 12.8.2 reconsideration process and was present to hear technical review comments discussed during the meeting. In the early part of January 2014 the NPC conducted its own oral hearings regarding the transportation corridor application.

On January 27-29, 2014 the NPC participated in the NIRB Public Hearing in respect of the Board's assessment of the ERP Proposal, including making a presentation and asking and answering questions during the technical presentations portion of the Public Hearing.

All documentation associated with the NIRB's reconsideration of the terms and conditions of Project Certificate No.: 005 can be accessed online from the NIRB's public registry at the following location:

<http://ftp.nirb.ca/03-MONITORING/08MN053-MARY%20RIVER%20IRON%20MINE/01-PROJECT%20CERTIFICATE/04-AMENDMENTS/ERP/>

## ***Comment Submissions***

As noted above, Aboriginal Affairs and Northern Development Canada stated, in its technical review comments provided to the NIRB on October 18, 2013 and forwarded to the NPC on November 14, 2013 that: "AANDC finds that the requirements of NBRLUP Appendix K appear to be met by Baffinland's FEIS Addendum and NBRLUP amendment application."

The technical review comments of Parks Canada with respect to the transportation corridor received by the NIRB on October 18, 2013 emphasized that the NPC and the NIRB should give due consideration to the fact that the process to establish a National Marine Conservation Area in Lancaster Sound is underway when the NPC and the NIRB consider the transportation corridor application. The submission also highlighted that pursuant to Article 8, Part 2, section 8.2.10 of the NLCA, the NBRLUP does not apply within National Parks, so any amendment to the NBRLUP recommended by the NPC would not change the application of the Plan within Sirmilik National Park.



The technical review comments of Transport Canada provided to the NIRB on October 18, 2013 identified that various aspects of the proposed transportation corridor may be governed by several Acts and Regulations administered by Transport Canada, including:

- *Arctic Waters Pollution Prevention Act*
- *Canada Shipping Act, 2001*
- *Coasting Trade Act*
- *Marine Liability Act*
- *Marine Transportation Security Act*
- *Marine Transportation Security Regulations*
- *Navigable Waters Protection Act*
- *Transportation of Dangerous Goods Act*
- *Transportation of Dangerous Goods Regulations*

At that time, Transport Canada also preserved the right to identify specific mitigation measures as further information and details on the transportation corridor became available during the ongoing environmental assessment.

Technical review comments were also received from the World Wildlife Foundation (WWF) that indicated that a central component of the review of the ERP Proposal would be the assessment of the potential for narwhal displacement from what WWF recognized to be very important natural summering habitat for thousands of narwhal. Furthermore, WWF noted that despite the assurances and conclusions presented in the FEIS and ERP FEIS Addendum, its position was that it is likely that there would be loss and reduced quality of Milne Inlet habitat for narwhal, and that this is not in conformity with the current regional NBRLUP (Sections 3.5.11 and 3.5.12, and Appendices G, J and K), and that it would be contrary to the purpose of the proposed Lancaster Sound National Marine Conservation Area.

In addition, at the NIRB Public Hearing, comments relevant to the following aspects of Appendices J and K were discussed:

- Item J 2: A comparison of the proposed route with alternative routes in terms of environmental and social factors as well as technical and cost considerations;
- Item K 1: physical and biophysical conditions;



- Item K 2: minimize negative impacts on community lifestyles;
- Item K 3: in keeping with existing legal and legislative requirements, including the NLCA, corridors shall not negatively impact:
  - important fish and wildlife harvesting areas;
  - key habitat for fish and wildlife species, especially areas used by endangered species; and
  - areas of high scenic, historic, cultural and archaeological value.

Table B-1 summarizes the additional relevant information about the potential impacts of the transportation corridor (Tote Road) that was provided during the NIRB's Public Hearing:

**Table B-1: Relevant Information from the NIRB Public Hearing**

**NPC Transportation Corridor Application: Tote Road**

Section of Appendix K	Comment	References
Item K 1: physical and biophysical condition	<ul style="list-style-type: none"> <li>• Concerns regarding the potential impacts to vegetation, human health, wildlife and surface water quality associated with dust emissions along the Tote Road</li> </ul>	<p>See for example the discussions of these issues in NIRB Public Hearing File No.: 08MN053, Early Revenue Phase Proposal, Transcripts:</p> <ul style="list-style-type: none"> <li>• January 27, 2014, pp. 177, 179, 188-189, 222-223, 235-236 and 244-245</li> <li>• January 28, 2014, pp. 342, 347 and 419</li> <li>• January 29, 2014, pp. 678-681, 683 and 684</li> <li>• January 30, 2014, p. 834</li> <li>• January 31, 2014, pp. 1007, 1015 and 1114</li> </ul>
Item K 1: physical and biophysical condition	<ul style="list-style-type: none"> <li>• Concerns regarding effects of permafrost degradation on road</li> </ul>	<p>See for example the discussions of these issues in NIRB Public Hearing</p>



	over the life of the project	<p>File No.: 08MN053, Early Revenue Phase Proposal, Transcripts:</p> <ul style="list-style-type: none"> <li>• January 27, 2014, pp. 213 and 214</li> <li>• January 29, 2014, p. 530</li> <li>• January 30, 2014, p. 847</li> <li>• January 31, 2014, pp. 1008 and 1046</li> </ul>
Item K 2: minimize negative impacts on community lifestyles	<ul style="list-style-type: none"> <li>• Safety concerns for hunters crossing the road associated with the placement of rock embankments along the road in places, such as where there are sharp drop offs or tight corners, required to ensure the safety of the ore trucks</li> </ul>	<p>See for example the discussions of these issues in NIRB Public Hearing File No.: 08MN053, Early Revenue Phase Proposal, Transcripts:</p> <ul style="list-style-type: none"> <li>• January 27, 2014, pp. 186, 189 and 198</li> <li>• January 30, 2014, pp. 780, 782, 800-801 and 817</li> </ul>
Item K 2: minimize negative impacts on community lifestyles	<ul style="list-style-type: none"> <li>• Potential changes to Inuit harvesters' access to traditional harvesting areas as a result of increased road use</li> </ul>	<p>See for example the discussions of these issues in NIRB Public Hearing File No.: 08MN053, Early Revenue Phase Proposal, Transcripts:</p> <ul style="list-style-type: none"> <li>• January 29, 2014, pp. 571, 585 and 640</li> </ul>
Item K 3: impacts on important fish and wildlife harvesting areas	<ul style="list-style-type: none"> <li>• Potential for increased water use associated with dust suppression along the road</li> <li>• Potential for impacts to water quality, terrestrial habitat and terrestrial wildlife that could be associated with accidents/malfunctions along the</li> </ul>	<p>See for example the discussions of these issues in NIRB Public Hearing File No.: 08MN053, Early Revenue Phase Proposal, Transcripts:</p> <ul style="list-style-type: none"> <li>• January 27, 2014, pp. 182, 183, 235, 237, 245, 278-281 and 287-289</li> <li>• January 28, 2014, p. 320</li> </ul>



	<p>road</p> <ul style="list-style-type: none"> <li>Impacts to water quality adjacent to the road associated with the use of gravel or other substances to improve traction on the road</li> </ul>	<ul style="list-style-type: none"> <li>January 31, 2014, pp. 1005-1007, 1046, 1115 and 1117</li> </ul>
Item K 3: impacts on key habitat for fish and wildlife species, especially areas used by endangered species	<ul style="list-style-type: none"> <li>Concerns regarding caribou mortality associated with both the potential for accidents involving caribou and ore trucks and increased harvesting activity along the road</li> <li>Potential for the road and for snow build up along the road to pose a barrier to caribou movement and to interfere with caribou calving</li> </ul>	<p>See for example the discussions of these issues in NIRB Public Hearing File No.: 08MN053, Early Revenue Phase Proposal, Transcripts:</p> <ul style="list-style-type: none"> <li>January 27, 2014, pp. 186-191, 194, 196, 198, 200, 201, 211, 212, 228 and 229</li> <li>January 28, 2014, pp. 347, 392-394, 401 and 402</li> <li>January 30, 2014, pp. 799 and 800</li> <li>January 31, 2014, pp. 1049 and 1113</li> </ul>

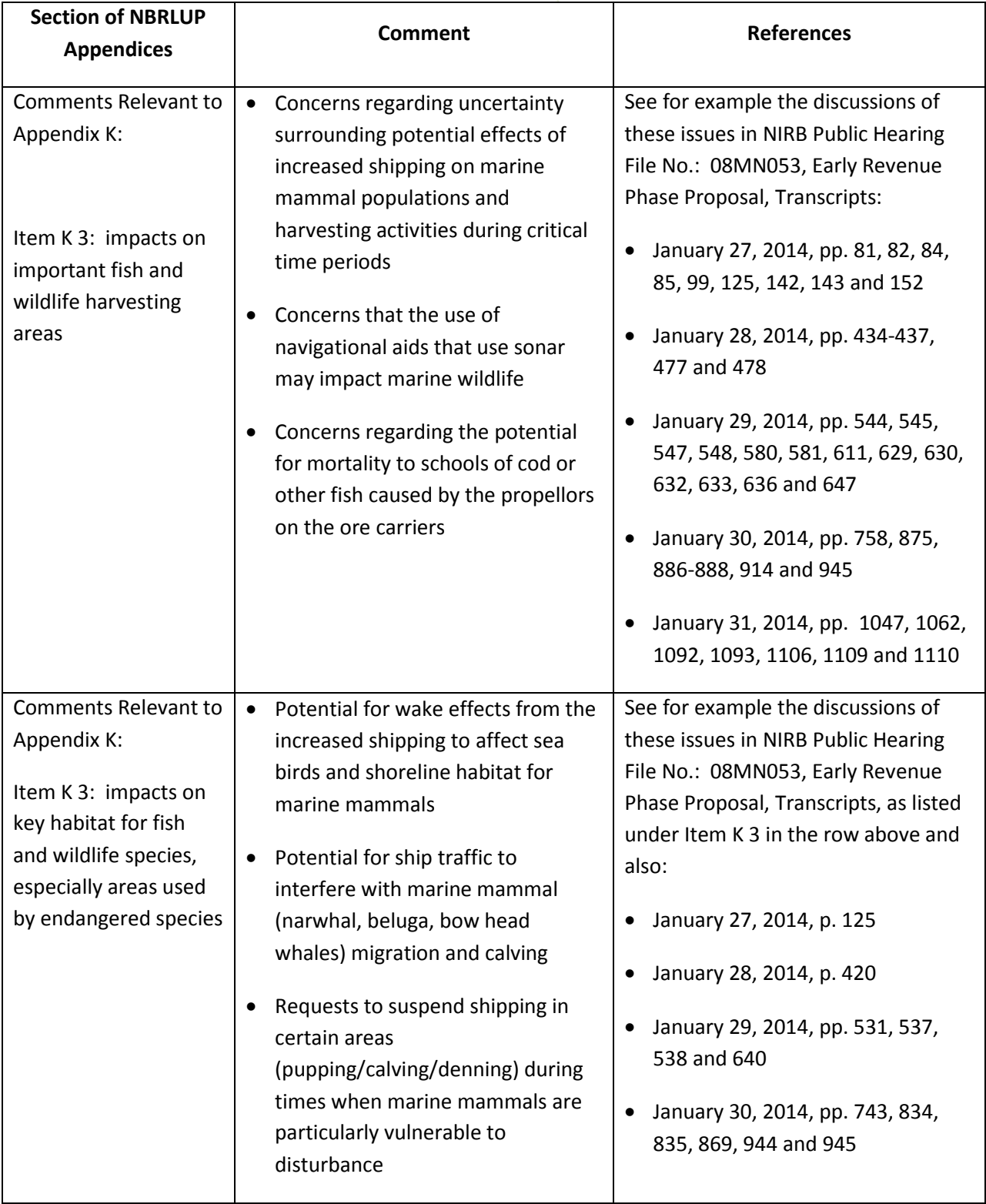
Table B-2 below summarizes the additional relevant information about the potential impacts of the transportation corridor (Shipping Route) that was provided during the NIRB's Public Hearing:

**Table B-2: Relevant Information from the NIRB Public Hearing**  
**NPC Transportation Corridor Application: Marine Shipping Route**

Section of NBRLUP Appendices	Comment	References
<p>Comments relevant to Appendix J:</p> <p>Item J 2: A comparison of the proposed route with</p>	<ul style="list-style-type: none"> <li>Concerns that ships passing too close to Button Point may impact seals that move inland in April and are particularly vulnerable to disturbance in June, July and August during mating/ pupping/</li> </ul>	<p>See for example the discussions of these issues in NIRB Public Hearing File No.: 08MN053, Early Revenue Phase Proposal, Transcripts:</p> <ul style="list-style-type: none"> <li>January 27, 2014, pp. 73, 75, 108,</li> </ul>



Section of NBRLUP Appendices	Comment	References
alternative routes in terms of environmental and social factors as well as technical and cost considerations	<p>calving and could also affect seabird colonies such as murre nesting at Button Point</p> <ul style="list-style-type: none"> <li>Concerns regarding emergency preparedness and contingency planning, as the proposed shipping route has an area that is subject to fog and also has been known to gather ice bergs</li> <li>The route transiting Eclipse Sound rather than Navy Board Inlet was chosen to reflect the prevailing ice conditions (significantly higher risk of multi-year ice in Navy Board Inlet)</li> </ul>	<p>116-18, 120-121, 132, 256-266, 275, 277, 278, 280, 293 and 294</p> <ul style="list-style-type: none"> <li>January 29, 2014, pp. 575, 580-582, 608, 609, 621 and 666-669</li> <li>January 30, 2014, p. 862</li> <li>January 31, 2014, pp. 116 and 117</li> </ul>
<p>Comments Relevant to Appendix K:</p> <p>Item K 1: physical and biophysical condition</p>	<ul style="list-style-type: none"> <li>The width of the proposed shipping corridor will be 3-6 nautical miles</li> <li>Concerns regarding the potential for deposition of soot/ash/other particulate on nearby glaciers due to air emissions associated with ships</li> </ul>	<p>See for example the discussions of these issues in NIRB Public Hearing File No.: 08MN053, Early Revenue Phase Proposal, Transcripts:</p> <ul style="list-style-type: none"> <li>January 27, 2014, pp. 163 and 164</li> <li>January 30, 2014, pp. 858-862, 881 and 882</li> </ul>
<p>Comments Relevant to Appendix K:</p> <p>Item K 2: minimize negative impacts on community lifestyles</p>	<ul style="list-style-type: none"> <li>Questions as to safety/warning system for Inuit harvesters when ships transiting Eclipse sound (e.g. whether a lighthouse or some kind of siren may be required to serve as a warning to people camping/boating in the area that a large ore ship is approaching)</li> </ul>	<p>See for example the discussions of these issues in NIRB Public Hearing File No.: 08MN053, Early Revenue Phase Proposal, Transcripts:</p> <ul style="list-style-type: none"> <li>January 27, 2014, p. 296</li> <li>January 29, 2014, p. 654</li> </ul>





Section of NBRLUP Appendices	Comment	References
	<ul style="list-style-type: none"> <li>Concerns that as open water season is exactly the timing when many different species converge in the area for critical phases in their lifecycle, mating, denning, birthing, etc. and effects at these critical points could have detrimental and lasting effects on marine mammal and sea bird populations</li> </ul>	<ul style="list-style-type: none"> <li>January 31, 2014, p. 1096</li> </ul>
Comments Relevant to Appendix K:  Item K 3: Impacts to areas of high scenic, historic, cultural and historic value	<ul style="list-style-type: none"> <li>Concerns regarding impacts to visitor and user experience in the National Park and proposed National Marine Conservation Area through sight and noise from project aircraft and ships</li> </ul>	See for example the discussions of these issues in NIRB Public Hearing File No.: 08MN053, Early Revenue Phase Proposal, Transcripts: <ul style="list-style-type: none"> <li>January 29, 2014, pp. 544 and 545</li> </ul>

## Conclusions

The Board notes that in contrast to the joint review conducted by the NPC/NIRB in association with the original Mary River Project Proposal that involved the development of a new railway, one aspect of the current joint review involves the intensification and change in use of the existing Milne Inlet Tote Road. Consequently, in respect of this aspect of the NIRB's joint review, the information to establish the routing for the transportation corridor, the site suitability for the road and alignment of the road were not considered to be relevant considerations, as the road alignment is not subject to change. The primary issue associated with the NIRB's assessment of the transportation corridor aspect of the ERP Proposal involving the Tote Road was the nature and extent of impacts likely to result from the intensification and change in use of the Tote Road.

With respect to the marine shipping route, the Board notes that ERP Proposal involves the intensification of use of an existing shipping route (used by the Proponent since 2008, receiving a positive conformity determination by the NPC in 2008 and approved for project resupply during the





## APPENDIX B: List of Exhibits from the Mary River Early Revenue Phase Public Hearing – January 27-31, 2014

Exhibit	Exhibit Description	Date	From
1	Hard Copy PowerPoint Presentation Final Hearing Presentation for the Addendum to Final Environmental Impact Statement January 27-31, 2014 English (PowerPoint)	January 27	Baffinland Iron Mines Corporation (Baffinland)
2	Hard Copy PowerPoint Presentation Final Hearing Presentation for the Addendum to Final Environmental Impact Statement January 27-31, 2014 Inuktitut (PowerPoint)	January 27	Baffinland
3	Hard Copy Baffinland Response to Final Written Submissions for the Proposed Early Revenue Phase January 25, 2014	January 27	Baffinland
4	Hard Copy PowerPoint Presentation Marine Baseline Survey Milne Inlet 2013 English	January 27	Baffinland
5	Hard Copy PowerPoint Presentation Terrestrial Effects Assessment English	January 27	Baffinland
6	Hard Copy PowerPoint Presentation Baffinland's Early Revenue Phase Proposal (ERP) English and Inuktitut	January 27	Nunavut Planning Commission
7	Hard Copy The Mary River Project Inuit Impact and Benefit Agreement between the Qikiqtani Inuit Association and Baffinland Iron Mines Corporation English	January 28	Qikiqtani Inuit Association
8	Hard Copy PowerPoint Presentation Mary River Project, Early Revenue Phase Final Hearing Presentation Inuktitut	January 28	Qikiqtani Inuit Association

<b>Exhibit</b>	<b>Exhibit Description</b>	<b>Date</b>	<b>From</b>
9	Hard Copy PowerPoint Presentation Mary River Project, Early Revenue Phase Final Hearing Presentation Inuktitut	January 28	Qikiqtani Inuit Association
10	Hard Copy Correspondence to R. Barry, NIRB from QIA Re: A Review of Project Certificate Number 005 Conformity with IIBA Hunting Rights Dated January 10, 2014	January 28	Qikiqtani Inuit Association
11	Hard Copy PowerPoint Presentation Conclusions and Recommendations of the Mary River Project Certificate for Baffinland Iron Mines Early Revenue Phase Proposal English and Inuktitut	January 28	Government of Nunavut
12	Hard Copy PowerPoint Presentation Conclusions and Recommendations of the Mary River Project Certificate for Baffinland Iron Mines Early Revenue Phase Proposal English and Inuktitut	January 28	Government of Nunavut
13	Hard Copy PowerPoint Presentation Final Hearing on Baffinland's Proposal Early Revenue Phase for the Mary River Project English and Inuktitut	January 28	Aboriginal Affairs and Northern Development Canada
14	Hard Copy PowerPoint Presentation Final Hearing on Baffinland's Proposed Early Revenue Phase for the Mary River Project French and English	January 28	Aboriginal Affairs and Northern Development Canada
15	Hard Copy PowerPoint Presentation Final Submission Regarding Baffinland Mary River Iron Ore Project Early Revenue Phase English	January 28	Environment Canada
16	Hard Copy PowerPoint Presentation Final Submission Regarding Baffinland Mary River Iron Ore Project Early Revenue Phase Inuktitut	January 28	Environment Canada

<b>Exhibit</b>	<b>Exhibit Description</b>	<b>Date</b>	<b>From</b>
17	Hard Copy PowerPoint Presentation Final Submission Regarding Baffinland Mary River Iron Ore Project Early Revenue Phase French	January 28	Environment Canada
18	Hard Copy PowerPoint Presentation Mary River Project Early Revenue Phase, Baffinland Iron Mines Corporation Public Hearing English	January 28	Fisheries and Oceans Canada
19	Hard Copy PowerPoint Presentation Mary River Project Early Revenue Phase, Baffinland Iron Mines Corporation Public Hearing Inuktitut	January 28	Fisheries and Oceans Canada
20	Hard Copy Technical Paper “National Risk Assessment for Introduction of Aquatic Nonindigenous Species to Canada by Ballast Water” Canadian Science Advisory Secretariat (CSAS) Research Document 2013/128, January 2014 English	January 28	Fisheries and Oceans Canada
21	Hard Copy PowerPoint Presentation Nunavut Impact Review Board Final Hearing Baffinland Iron Mines Corporation Mary River Project Early Revenue Phase Proposal January, 2014 English	January 28	Transport Canada
22	Hard Copy PowerPoint Presentation Nunavut Impact Review Board Final Hearing Baffinland Iron Mines Corporation Mary River Project Early Revenue Phase Proposal January, 2014 Inuktitut	January 28	Transport Canada
23	Hard Copy PowerPoint Presentation Nunavut Impact Review Board Final Hearing Baffinland Iron Mines Corporation Mary River Project Early Revenue Phase Proposal January, 2014 French	January 28	Transport Canada

<b>Exhibit</b>	<b>Exhibit Description</b>	<b>Date</b>	<b>From</b>
24	Hard Copy PowerPoint Presentations Marine Baseline Survey Milne Inlet 2013 and Terrestrial Effects Assessment (Translated copies of Exhibits 4 and 5) Inuktitut	January 29	Baffinland Iron Mines Corporation
25	Hard Copy PowerPoint Presentation NRCan Final Hearing Presentation Mary River ERP Project English	January 29	Natural Resources Canada
26	Hard Copy PowerPoint Presentation NRCan Final Hearing Presentation Mary River ERP Project Inuktitut	January 29	Natural Resources Canada
27	Hard Copy PowerPoint Presentation NRCan Final Hearing Presentation Mary River ERP Project French	January 29	Natural Resources Canada
28	Hard Copy PowerPoint Presentation Mary River Early Revenue Phase Final Hearings Parks Canada English/Inuktitut	January 29	Parks Canada
29	Hard Copy PowerPoint Presentation Mary River Early Revenue Phase Final Hearings Parks Canada French	January 29	Parks Canada
30	Hard Copy PowerPoint Presentation Hamlet of Pond Inlet Presentation to the NIRB January 28, 2014 English	January 29	Hamlet of Pond Inlet
31	Hard Copy PowerPoint Presentation Mittimatalik Hunters and Trappers Organization Inuktitut	January 29	Mittimatalik Hunters and Trappers Organization
32	Electronic Copy of Comments Presented on January 30, 2014 Presented by the Pond Inlet Mary River Project Committee Inuktitut	January 30	Pond Inlet Mary River Project Committee

<b>Exhibit</b>	<b>Exhibit Description</b>	<b>Date</b>	<b>From</b>
33	Electronic Copy of Comments Presented on January 30, 2014 Presented by the Pond Inlet Mary River Project Committee English	January 30	Pond Inlet Mary River Project Committee
34	Hard Copy PowerPoint Presentation Mary River Project Early Revenue Phase Final Hearing Presentation to Community Roundtables English	January 30	Qikiqtani Inuit Association
35	Hard Copy PowerPoint Presentation Mary River Project Early Revenue Phase Final Hearing Presentation to Community Roundtables Inuktitut	January 30	Qikiqtani Inuit Association
36	Hard Copy PowerPoint Presentation Final Submission Regarding Mary River Iron Ore Project Early Revenue Phase English	January 30	Environment Canada
37	Hard Copy PowerPoint Presentation Final Submission Regarding Mary River Iron Ore Project Early Revenue Phase Inuktitut	January 30	Environment Canada
38	Hard Copy PowerPoint Presentation Final Submission Regarding Mary River Iron Ore Project Early Revenue Phase French	January 30	Environment Canada
39	Hard Copy PowerPoint Presentation Mary River Early Revenue Phase Final Hearings English/Inuktitut	January 30	Parks Canada
40	Hard Copy PowerPoint Presentation Mary River Early Revenue Phase Final Hearings French	January 30	Parks Canada
41	Hard Copy PowerPoint Presentation NRCan Community Roundtable Presentation Mary River ERP English	January 30	Natural Resources Canada

<b>Exhibit</b>	<b>Exhibit Description</b>	<b>Date</b>	<b>From</b>
42	Hard Copy PowerPoint Presentation NRCan Community Roundtable Presentation Mary River ERP Inuktitut	January 30	Natural Resources Canada
43	Hard Copy PowerPoint Presentation NRCan Community Roundtable Presentation Mary River ERP French	January 30	Natural Resources Canada
44	Hard Copy PowerPoint Presentation Nunavut Impact Review Board Final Hearing Baffinland Iron Mines Corporation Mary River Project Early Revenue Phase Proposal, January 2014 English	January 30	Transport Canada
45	Hard Copy PowerPoint Presentation Nunavut Impact Review Board Final Hearing Baffinland Iron Mines Corporation Mary River Project Early Revenue Phase Proposal, January 2014 Inuktitut	January 30	Transport Canada
46	Hard Copy PowerPoint Presentation Nunavut Impact Review Board Final Hearing Baffinland Iron Mines Corporation Mary River Project Early Revenue Phase Proposal, January 2014 French	January 30	Transport Canada
47	Electronic Copy Written Submission presented orally on January 30 English	January 30	Zacharias Kunuk and Isuma TV
48	Electronic Copy E-Mail to the Nunavut Impact Review Board dated January 31, 2014 containing link to "The Arctic Marine Shipping Assessment, 2009"	January 31	Transport Canada
49	Electronic Copy "Canadian Arctic Shipping Assessment Main Report, June 2007"	January 31	Transport Canada
50	Hard Copy Joint Statement of QIA and Baffinland to the Nunavut Planning Commission and the Nunavut Impact Review Board regarding Appendix I of the	January 31	Baffinland Iron Mines Corporation and Qikiqtani

<b>Exhibit</b>	<b>Exhibit Description</b>	<b>Date</b>	<b>From</b>
	North Baffin Regional Land Use Plan		Inuit Association
51	Video clip Simulation of ore truck traffic spacing on the Mary River Tote Road	January 31	Baffinland Iron Mines Corporation
52	Hard Copy Youth Report (Perspectives)	January 31	Tim Anaviapik-Soucie Pond Inlet Youth Delegated
53	Hard Copy Government of Nunavut Recommended Amendments to Project Certificate 005 Terms and Conditions (if the amendment is approved)	January 31	Government of Nunavut
54	Hard Copy Project Certificate 005 Amendment Considerations for the Early Revenue Phase	January 31	Baffinland Iron Mines Corporation



## APPENDIX C: List of Acronyms

[illegible]



NPC	Nunavut Planning Commission ᓄᓇᖅᓴᑦ ᐸᓇᐃᓐᐸᑦ
NRCan	Natural Resources Canada ᐅᓇᑕᑦ ᓄᓇᑦᑕᑦᑕᑦᑕᑦ
NTI	Nunavut Tunngavik Incorporated ᓄᓇᖅᑦ ᑕᓐᓴᓴᐃᑦ ᐃᓐᑕᐃᑦᑕᑦ
NWB	Nunavut Water Board ᓄᓇᖅᑦ ᐃᑕᑦᑕᑦᑕᑦ ᐅᑕᑦᑕᑦ
NWMB	Nunavut Wildlife Management Board ᓄᓇᖅᓴᑦ ᐅᑕᑦᑕᑦᑕᑦᑕᑦ ᐅᑕᑦᑕᑦ
PC	Parks Canada ᐅᓇᑕᑦ ᑦᓴᑕᑦᑕᑦᑕᑦᑕᑦ
PHC	Preliminary Hearing Conference ᐃᓄᑦᑕᑦᑕᑦᑕᑦ ᐃᓄᐃᑦ ᐅᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦ ᐅᑕᑦᑕᑦ
QIA	Qikiqtani Inuit Association ᑦᑕᑦᑕᑦᑕᑦ ᐃᓄᐃᑦ ᐅᑕᑦᑕᑦᑕᑦᑕᑦ
RSA	Regional Study Area ᓄᓇᑕᑦ ᐃᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦ ᑦᐅᑕᑦᑕᑦᑕᑦ
SARA	Species at Risk Act ᐅᑕᑦᑕᑦ ᐃᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦ ᑕᑕᑦᑕᑦᑕᑦ
SEMC	Socio-Economic Monitoring Committee ᐃᓄᑕᑦᑕᑦᑕᑦ -ᐃᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦ ᑕᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦ ᑦᐅᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦ ᐅᑕᑦᑕᑦᑕᑦ
TC	Transport Canada ᐅᓇᑕᑦ ᐃᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦ
TDS	Total Dissolved Solids ᑕᑕᑦᑕᑦᑕᑦ ᐃᑕᑦᑕᑦᑕᑦᑕᑦ ᐅᑕᑦᑕᑦ
TK	Traditional Knowledge ᐃᓄᑦᑕᑦ ᑦᐅᑕᑦᑕᑦᑕᑦ
VEC	Valued Ecosystem Component ᐅᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦ ᐃᑕᑦᑕᑦᑕᑦᑕᑦ ᐃᓄᑦᑕᑦ ᐃᑕᑦᑕᑦᑕᑦᑕᑦ
VSEC	Valued Socio-Economic Component ᐃᓄᑕᑦᑕᑦᑕᑦ -ᐃᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦᑕᑦ ᐃᓄᑦᑕᑦ ᐃᑕᑦᑕᑦᑕᑦᑕᑦ