IR Number: *1*
Source: *Parks Canada*
To: *Baffinland Iron Mines Corporation (Baffinland)*
Subject: Implications of project on "Wilderness Experience" in context of Sirmilik National Park and proposed Lancaster Sound National Marine Conservation Area.
Preamble:
PC specified EIS Guidelines subsection 8.2.4.2 Potential impact on tourism from mine development which impairs the "wilderness experience" of tourism in the Project region. BIM will provide a more complete explanation and rationale that includes the proximity of the Park in relation to the project activities and includes a variety of perspectives. The number of eco-tourists is not seen as the only factor as a Park should be available for the "wilderness" experience no matter who chooses to come. A brief description of the shipping frequency is required. As well, it may be appropriate to offer to mitigate the potential surprise someone may have in expecting wilderness and seeing the ships by informing Parks when shipments are expected so they can pass on that information to visitors. In addition, there is a concern around the potential for frequent over flights of a key fjord in the Park by flights from Mary River to Pond Inlet. A better understanding of the frequency of these flights, altitude over the fjord and options for moving this path outside or to a more remote part of the Park may be considered. John Olyslager provided the following considerations he would like to see addressed: Based on information provided by Baffinland, it appears that the air-route between Pond Inlet and Baffinland crosses Oliver Sound and Paquette Bay. Oliver Sound in particular is used by people from the community, and there has been interest in use of this area by kayakers. We know from feedback from visitors to Auyuittuq National Park that the air traffic between Pangnirtung and Qikiqtarjuaq detracts from the wilderness experience, particularly annually. Feedback from visitors at Gwaii Haanas National Park Reserve also identifies air traffic as a negative influence on their experience, especially as the sound is amplified over water."

Request:

1. *Please assess the implications of the project on 'wilderness' experience', particularly in the context of the presence of Sirmilik National Park and the proposed Lancaster Sound National Marine Conservation Area.*

BAFFINLAND RESPONSE

Background

While the Mary River mine site is a considerable distance from the boundary of Sirmilik National Park (approximately 80 km from the southern portion of the park), some transportation routes to the project area will be in closer proximity to park boundaries. Aircraft will be used to move employees to and from the mine site, while freight vessels and fuel tankers will service the mine, sailing through to Milne Port and Steensby Port. The presence of over-flights and shipping routes can have the potential to affect the wilderness experience of visitors to the park.

The Canada National Parks Act states that "The national parks of Canada are hereby dedicated to the people of Canada for their benefit, education and enjoyment...." Parks Canada is committed to offering high-quality visitor services by ensuring that park resources do not deteriorate and that quality visitor experiences are not diminished. With the Mary River project

having air and shipping routes that will pass in close proximity to the Sirmilik National Park boundary, artificial disturbances such as over-flights and shipping need to be examined in terms of how these activities will affect visitor satisfaction and their overall "wilderness experience" within the park.

Methodology

The anticipated affects of air and water traffic associated with the Project are currently being evaluated using a combination of literature review and key informant interviews with staff from Parks Canada. The selection of respondents from Parks Canada was based on selecting individuals who had intimate knowledge of visitation within Sirmilik National Park and on-the-ground experience and familiarity with park management. Carey Elverum (Sirmilik National Park Manager in Pond Inlet) and Pauline Scott (Visitor Experience Manager & Prevention Coordinator in Iqaluit) have been contacted and have expressed interest in taking part in the interviews. Interviews will involve a mapping exercise, and a combination of written and telephone interviews. Maps have been developed that depict the anticipated flight and shipping paths in association with the park boundaries. Through discussions with Parks Canada staff, the maps will be reviewed and areas of concerns (i.e. those areas of recreational importance that may be in closest proximity to flights and shipping) will be discussed.

Respondents from Parks Canada will also be asked to characterize visitation within the park. This will involve providing visitation numbers, primary destinations of visitors, primary activities of visitors, seasons of use and number of guided tours. The respondents will be asked to discuss how they expect park visitors to respond to the added presence of more over-flights and shipping traffic. The discussions from Parks Canada will then be corroborated with findings from other outdoor recreation studies and literature that focus on wilderness experience and man-made disturbances. Based on the findings of the interviews and literature review, mitigation methods will be proposed to minimize the disturbance of these project-related activities on visitor experience in the park.

Over-flight and Shipping

The Mary River project will be supported by a variety of modes of transportation, including aircraft flights and shipping. Air transportation includes flights by helicopter, Boeing 737, Dash-8 and small fixed wing planes. The general routes followed by these various modes of air transportation are depicted in Map 1. More specific to the Sirmilik National Park, two flight lines come are shown in relation to the park boundary, both along a Dash-8 route (see Map 2). The first route flies from the mine site to Arctic Bay, south of the park boundary, crossing inland over Borden Peninsula. The second route flies from the mine site through Pond Inlet then to

Clyde River. This route is loosely projected to fly over the southern section of Sirmilik National Park, near Oliver Sound and Paquet Bay.

The frequency of flights is not known with certainty, as this will depend in part on the number of workers that will be employed from each of the communities, although in the first two years of construction, it is anticipated that seven flights will service the mine site per week. Of these seven flights, it is estimated at this stage that one would bring employees from Pond Inlet and one would bring employees from Arctic Bay. Thus, only two over-flights a week (i.e., flight to the mine and flight away from the mine) would be anticipated along the flight lines near Sirmilik National Park. After the first two years, the frequency of flights is anticipated to be lower. It is expected that Dash 8 aircraft will service the flights from Arctic Bay and Pond Inlet. At normal cruising altitude a Dash 8 aircraft will fly at 16 000 feet which is not audible to wildlife or humans. This altitude does vary with approach, take off, weather conditions and distance travelled.

Table 1. Air Traffic near Sirmilik National Park Boundary.

Route	Aircraft	Frequency				
		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5 - 25**
Mine Site – Arctic Bay	Dash-8	1 each week	1 each week	1 each week or less	1 each week or less	1 each week or less
Mine Site – Pond Inlet – Clyde River	Dash-8	1 each week	1 each week	1 each week or less	1 each week or less	1 each week or less

Baffinland will also use shipping to move freight and fuel to the mine site. Of the two shipping routes, only the Milne Port shipping route will be in close proximity to Sirmilik National Park and the Lancaster Sound National Marine Conservation Area (NMCA). The Milne Port shipping route goes from Milne Inlet through Eclipse Sound out into Baffin Bay. Shipping frequency from Milne Inlet is described in Table 2 and depicted in Map 3. Peak shipping of freighters will occur in Year 1 of the construction phase with an estimated 10 freight vessels over the year. Approximately 3–6 fuel tankers are expected annually for most years for the duration of the project.

Table 2. Shipping Traffic from Milne Inlet near Sirmilik National Park Boundary.

Shipping of Freight and Fuel	Construction Phase				Operation Phase
	Year 1	Year 2	Year 3	Year 4	Year 5 - 25
Freight vessels	10	6	3	3	3
Fuel tankers	2	3-6	3-6	3-6	3-6

Park Visitation

Sirmilik National Park offers a variety of wilderness experiences. Visitation typically occurs in spring (late April to early June) for winter activities, and after ice break-up in summer (late July to early September) for hiking and camping. The park is not accessible during ice break-up (mid-June to late July) and freeze-up (mid-October to early November). Hiking and camping opportunities are available at Bylot Island, the Borden Peninsula, and Oliver Sound during the short summer season. Oliver Sound has good opportunities for sea kayaking or canoeing, but only for those who are very experienced. Boat transportation to drop-off and pick-up points is typical. Several cruise ships also visit Pond Inlet every summer. During the spring, visitors will often ski-tour on the sea ice. Ski-touring and glacier travel is also possible in the mountain and icefield regions of the park.

Effects on Wilderness Experience

Over-flights by aircraft can result in reduced wilderness experience by park visitors, as witnessed in other northern parks including Kluane, Auyuittuq and Quttinirpaaq National Parks (Lachapelle, McCool and Watson, 2005). Visitor satisfaction has frequently been demonstrated to be negatively influenced by the presence of overflights. The degree of dissatisfaction or annoyance often is typically related to the volume of noise and the frequency of overflights (Gramann, 1999). An increasing number of overflights is typically correlated with a decrease in visitor satisfaction.

Other northern parks have chosen to set indicators of what is acceptable for encounters with air traffic in order to ensure that “wilderness experience” is maintained. For example, on the Alsek River Corridor in Kluane National Park and Reserve, a target for aircraft encounters has been set at three flights over the course of two days (Parks Canada 2010). In the icefields of

Kluane, the target for mean number of encounters with aircrafts has been set at less than 1.6 per day along routes, and less than 3.7 per day at (base) camps.

As described in Table 1, Baffinland estimates that one flight per week could fly from both Pond Inlet and Arctic Bay at the construction stage of the project, and even fewer flights during mine operations. While overflights could result in a slight negative effect on visitor satisfaction, the frequency should be so low that this will not affect their overall wilderness experience significantly, nor influence the behaviour or destination choice of visitors within the park. Oliver Sound likely will be the area most affected by the sounds of over-flights due to its popularity as a destination and its position under the flight path. Kayakers, canoers and backcountry hikers could all have encounters with aircrafts. The effects of overflights can be further minimized by incorporating various mitigation methods, to be discussed below.

Unlike the affects of air traffic, the affect of shipping traffic on wilderness experience and visitor satisfaction is not discussed in detail in the outdoor recreation literature. As in terrestrial systems, increased human presence in a marine environment, such as shipping, will generally result in a negative impact on the overall quality of wilderness experience (Barr 2001). Similar principals likely apply as with air traffic, where the frequency of interactions with ships is correlated with negative impacts on visitor satisfaction and wilderness experience.

In the context of the Mary River project, shipping traffic is maintained at a low frequency and is restricted specifically to the Milne Inlet and Eclipse Sound. Eclipse Sound falls within the boundaries of the proposed Lancaster Sound Marine Conservation Area. Interactions with recreationists will largely be limited to other boaters using Eclipse Sound, such as tourists on arctic cruise ships. As reported in Table 2, Baffinland estimates that a maximum of 3–10 freight ships and 2–6 fuel tankers will use this route each year. Encounters with ships will likely result in a negative effect on visitor satisfaction. However, the low frequency should prevent significant affects to wilderness experience. These effects can likely be mitigated by various management techniques.

Mitigation of Impacts

Various mitigation techniques can be applied to minimize any significant effect of air and shipping traffic on the wilderness experience of visitors. Several mitigation techniques specific to management of noise from air traffic are consistent with those identified in the "Replacement Class Screening Report for Aircrafts Landing in the Northern National Parks of Canada" (Parks Canada, 2004).

Recommended mitigation techniques to ensure that there is no significant impacts on the wilderness experience of visitors include the following:

- Maintain a minimum flying altitude of 2000 feet (cruising altitude of a Dash 8 aircraft is 16 000 feet) when in the air space over the park except for approach to land, take-off or for safety reasons.
- Ensure certification of noise compliance, if applicable, is current.
- Provide Parks Canada with regular flight and shipping schedules that can be provided to visitors to the park. Briefing visitors on flight and shipping schedules will help prepare them for possible interactions and allow visitors to practice some avoidance if so desired.

Although shipping and air flights have the potential to have a negative effect on visitor experience, the implementation of the recommended mitigation measures coupled with the low frequency of interactions should result in a negligible impact on their wilderness experience of the majority of park visitors. At this time, a precise number of flights from each of the communities can not be provided as the number of workers from each community is not known. However, as this information becomes available, the above mitigation measures could help to mitigate effects to wilderness experience in the parks.

Literature Cited

Barr, B. 2001. "Getting the job done: protecting marine wilderness". In Harmon, D. (Ed.) *Crossing Boundaries in Park Management: Proceedings of the 11th Conference on Research and Resource Management in Parks and on Public Lands*, Hancock, Michigan: The George Wright Society.

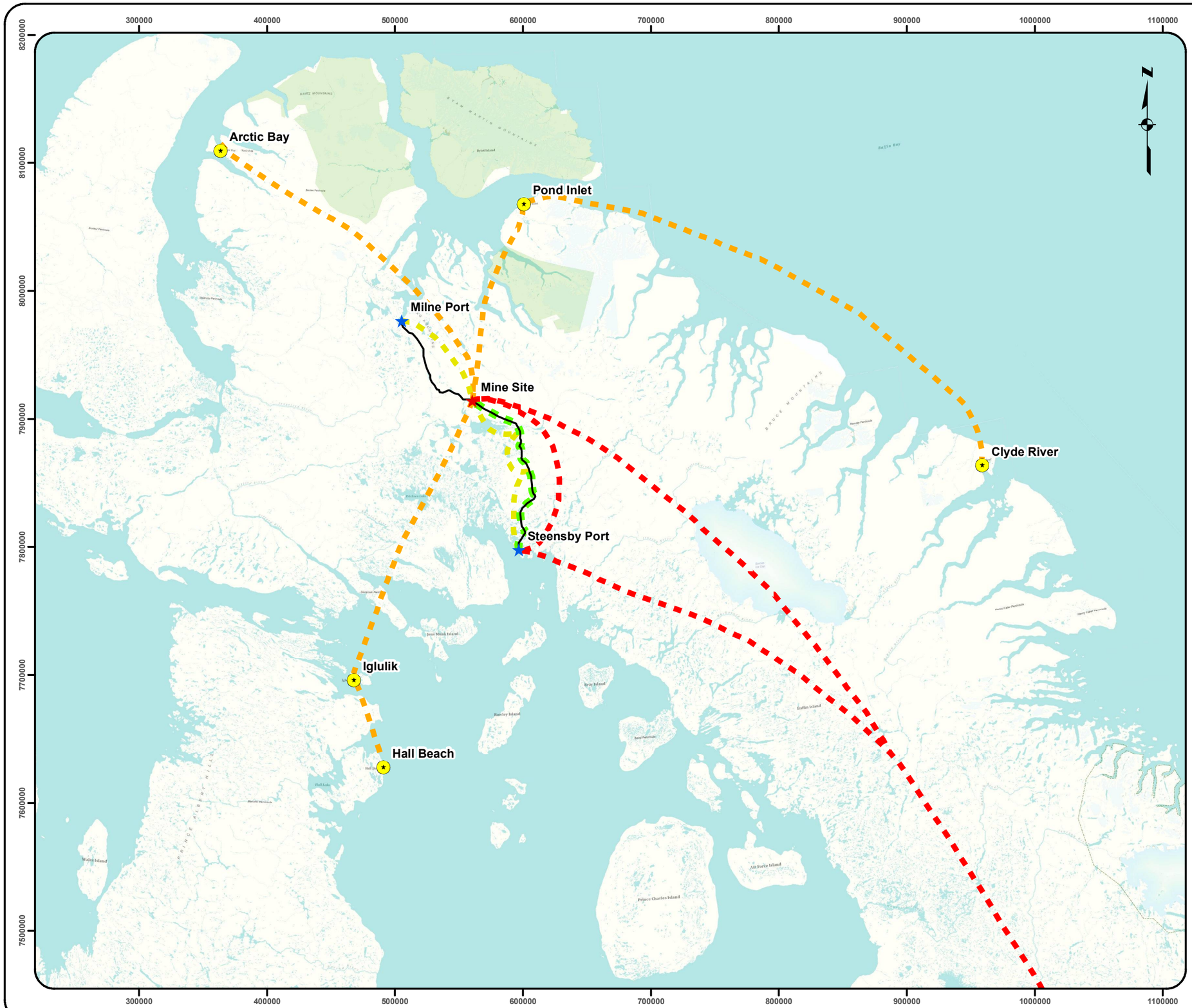
Gramann, J. 1999. "The Effect of Mechanical Noise and Natural Sound on Visitor Experiences in Units of the National Park System". Social Science Review. Volume 1, Number 1, Winter 1999.

Lachapelle, P.R., McCool, S.F, and Watson, A.E. 2005. Auyuittuq and Quttinirpaaq National Parks Summer 2004 Visitor Experience Study. University of Montana and Aldo Leopold Wilderness Research Institute. Missoula, MO.

Parks Canada. 2004. Replacement Class Screening Report for Aircraft Landings in the Northern National Parks of Canada. Viewed August 9, 2011 <http://www.ceaa.gc.ca/050/documents/5548/5548E.pdf>

Parks Canada. 2010. Kluane National Park and Reserve of Canada: Management Plan. Viewed August 9, 2011 <http://www.pc.gc.ca/eng/pn-np/yt/kluane/plan.aspx>

Map 1. Overview of all flight paths servicing the Mary River project.



LEGEND

DRAFT

- Communities

Other Sites

- Milne Port
- Mine Site
- Steensby Port

Flight Lines

- Helicopter
- 737 Flight
- Dash-8 Flight
- Small Fixed Wing
- Tote Road

National Parks

- Sirmilik

0 37.5 75 150

Kilometers

Scale: 1:3,000,000 Original Map Size 11x17in

Baffinland Iron Mines Corporation

Figure 1: Air Traffic Patterns

Drawn: D. Weber	Datum/Projection: NAD 1983 UTM Zone 17N
Checked: R. Morris	EDI Project No.: 11-Y-0128
Date: 09/08/2011	Data Sources: Refer to References Section

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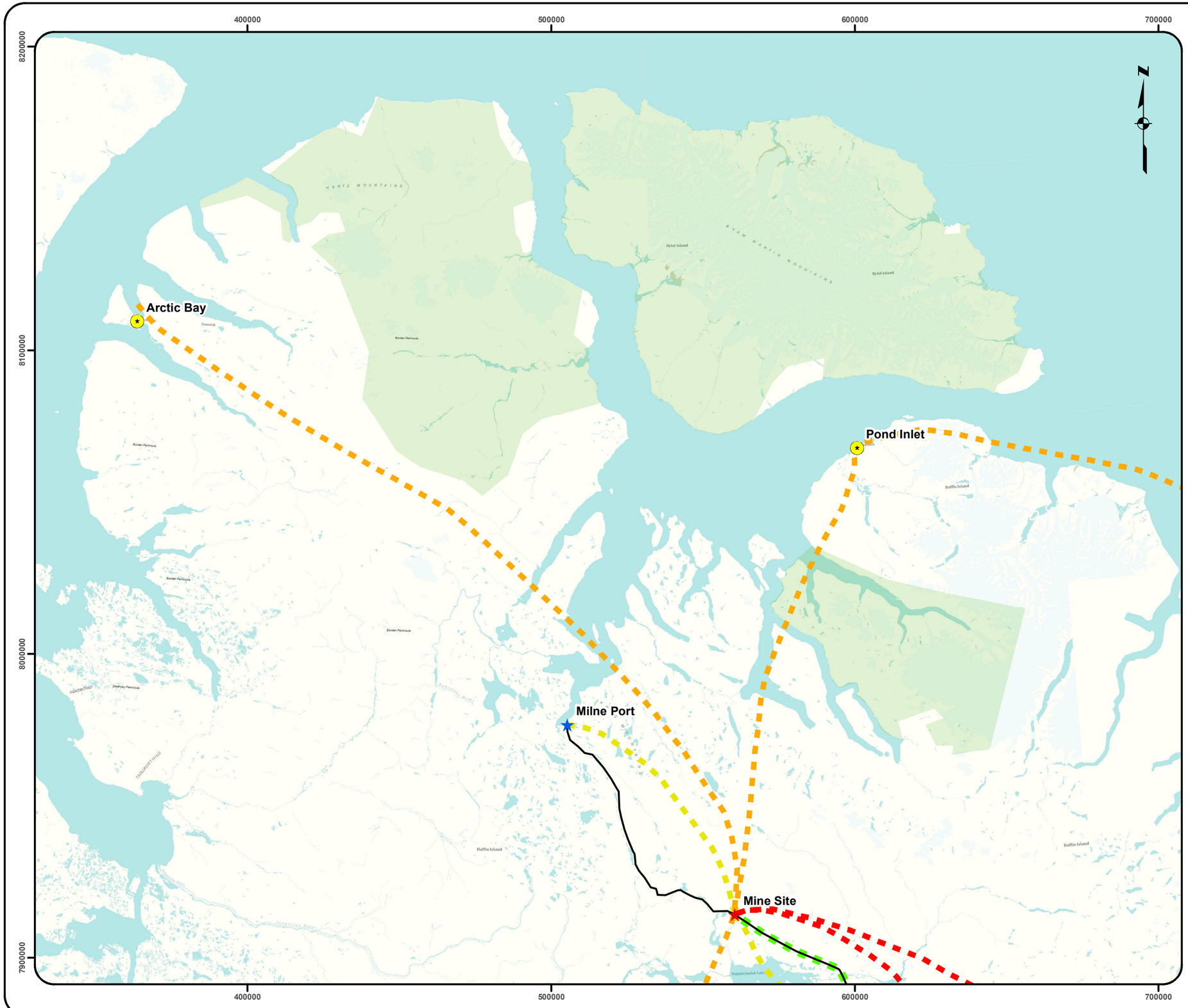
Map 2. Flight paths in close proximity to Sirmilik National Park.



LEGEND

DRAFT

- Communities

Other Sites

- Milne Port
- Mine Site
- Steensby Port

Flight Lines

- Helicopter
- 737 Flight
- Dash-8 Flight
- Small Fixed Wing
- Tote Road

National Parks

- Sirmilik

0 15 30 60
Kilometers

Scale: 1:1,260,000 Original Map Size 11x17in

Baffinland Iron Mines Corporation

Figure 2: Sirmilik National Park

Drawn: D. Weber	Datum/Projection: NAD 1983 UTM Zone 17N
Checked: R. Morris	EDI Project No.: 11-Y-0128
Date: 10/08/2011	Data Sources: Refer to References Section

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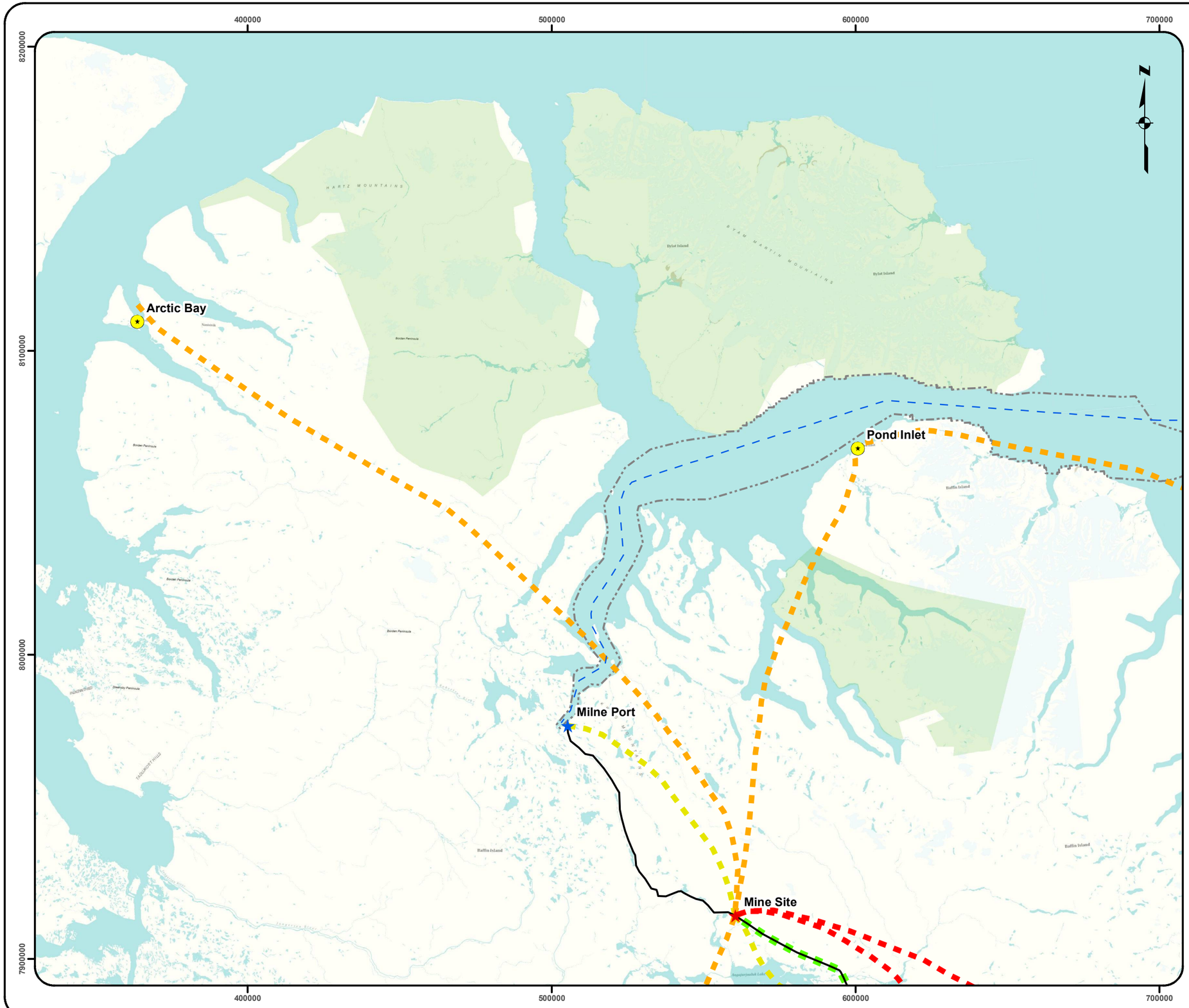
Map 3. Shipping route from Milne Port near Sirmilik National Park



LEGEND

DRAFT

- Communities

Other Sites

- Milne Port
- Mine Site
- Steensby Port

Flight Lines

- Helicopter
- 737 Flight
- Dash-8 Flight
- Small Fixed Wing
- Tote Road
- Shipping Route (Graphic Rep Only)
- Ship Route (20kmBuffer)

National Parks

- Sirmilik

0 15 30 60
Kilometers

Scale: 1:1,260,000 Original Map Size 11x17in

Baffinland Iron Mines Corporation

Figure 8a: Milne Port Shipping Route

Drawn: D. Weber	Datum/Projection: NAD 1983 UTM Zone 17N
Checked: R. Morris	EDI Project No.: 11-Y-0128
Date: 15/08/2011	Data Sources: Refer to References Section

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