Baffinland
Iron Mines Corporation

MARY RIVER PROJECT
ENVIRONMENTAL IMPACT STATEMENT

EXECUTIVE SUMMARY

SECTION 1.0 - PROJECT SUMMARY

Baffinland Iron Mines Corporation (Baffinland) has prepared an environmental impact statement (EIS) for development of its Mary River Project. The Project is located on northern Baffin Island, in the Nunavut Territory, in the Canadian arctic. The EIS has been submitted to the Nunavut Impact Review Board (NIRB) for detailed environmental and socio-economic review. This EIS will also be reviewed by the federal and territorial government agencies, Inuit organizations, local communities and other stakeholders. NIRB issued guidelines for the preparation of this EIS on November 16, 2009 and an amendment to the guidelines on November 3, 2010. These guidelines outline the information that Baffinland should include in its EIS.

1.1 THE PROPONENT

Baffinland is a publicly traded Canadian junior mineral exploration company (TSX:BIM) focused on development of its 100%-owned Mary River iron ore deposits. The corporate office of the company is in Toronto.

1.2 THE PROJECT

The Mary River Project (the Project) consists of mining high grade iron ore from Deposit No. 1 at a production rate of 21 Mt/a. The development of the Project includes the construction, operation, closure and post-closure activities associated with the mine and its associated infrastructures, the construction of a 149 km long railway to link the Mine Site to a new port facility located at Steensby Inlet, the upgrade of an existing 100-km road to link the Mine Site to a new port facility located at Milne Inlet, and construction of the Steensby and Milne ports. Approximately 3 Mt of ore will be shipped during the open water season each year from Milne Port, and approximately 18 Mt of ore will be shipped year-round from Steensby Port using ice breaking ore carriers. The main destination of the ore is Europe.

1.3 PROJECT SCHEDULE AND PROJECT LIFE

The Project construction will take an estimated 4 years. Based on current ore reserves, the mine will operate for 21 years at a production rate of 21 Mt/a. Closure of the facilities is expected to be carried out over a 3 year period and post-closure monitoring will follow for an additional 5 years. For the purpose of the EIS, the Project life, from the start of construction activities to post-closure, is 33 years.

Additional ore deposits have been identified in the Mary River area and Baffinland is hopeful that the Project life will be extended and that the production rates will increase over time.

SECTION 2.0 - HIGHLIGHTS OF THE PROJECT

The Mine Site, Milne Port, and Steensby Port are the three major Project sites. Each site will be equipped with the necessary infrastructure to ensure its operation. This includes maintenance and administrative facilities, warehouses and laydown areas, ore stockpiles and associated runoff management facilities, camps, water supply, wastewater treatment facilities, waste management facilities, landfill, power generation, fuel depots, telecommunication facilities, and, an airstrip.

In addition to these facilities, the Mine Site includes the open pit mine, the mining fleet, an explosives storage and preparation facility, a waste rock stockpile, ore sizing facilities, ore loading facilities for both trucks and rail cars. After crushing and sizing, up to 3 Mt/a of iron ore will be transported by trucks to Milne Port and up to 18 Mt/a of ore will be transported by railway to Steensby Port.

Milne Inlet Port will be operated during the open-water shipping season. The port installations will include a freight dock and a single birth ore loading dock, truck maintenance facilities. Ore will be shipped in vessels of 50 000 to 60 000 tonnes beginning in the second year of the construction phase.

The Steensby Port will operate year-round and will be accessed by a specially built fleet of ice breaking ore carriers. These carriers will have a capacity of between 160,000 to 190,000 tonnes. In addition to the facilities described above, Steensby Port will include a freight dock, a two berth ore loading dock with associated material handling/loading facilities, a rail car dumper and associated conveying equipment, an explosives storage/preparation facilities, the main fuel depot (160 000 m^3 of diesel), and, a locomotive maintenance shop. Steensby Port will be operational at the completion of railway construction.

Permanent camps varying sizes will be built at each of these three sites. The camps will include dormitories, cafeteria, medical and leisure facilities. These camps will be of modular construction and will be built at the beginning of the construction phase and later downsized to accommodate workers for the operation phase. Peak camp occupancy during construction is expected to be 1,200 beds for the Mine Site, 600 beds for Steensby Port and 165 beds for Milne Port. At least 4 additional temporary camps ranging in size from 50 to 400 beds will be required for the construction of the railway, and, one temporary camp for the upgrade of the Milne Inlet Tote Road. Permanent camp occupancy for the operation phase will drop to 475 beds at the Mine Site, 175 beds at Steensby and between 30 to 105 beds at Milne Port.

The public road linking the Mine Site to Milne Port will be upgraded at the start of the construction. The alignment will be improved to reduce the number of sharp turns, lower the grade in certain areas, and improve creek crossing structure. Five new bridges will be installed. The work will take 18 months to complete and will enable shipment of ore via Milne Port by the second year of the Project construction phase.

The railway construction will take four years to complete and will require the construction of a temporary access road and several quarries. The railway consists of a rail embankment, wooden ties, and steel rails. A total of 24 bridges will be constructed for the railway, two tunnels, and extensive rock cuts along Cockburn Lake. Level crossings will be prepared at key areas along the railway's length to enable hunters and caribou to cross the tracks safely.

2.1 ORE PRODUCTS

Because the Mary River iron ore is high-grade, processing is limited to sizing of the ore to produce smaller pieces to specifications required by the steel mills. This is accomplished by crushing and screening of the ore to produce two iron ore "products":

- a **lump ore** product in which the pieces of ore are between 6.3 mm and 31.5 mm in size, and,
- a **fine ore** product, in which the pieces of ore are less than 6.3 mm in size.

Crushers and screens will be installed inside buildings, and conveyors will be covered and equipped with wind ventilation hoods to reduce wind exposure and the potential for dust generation. All ventilation ducts will be routed to dust collectors which will limit dust emissions.

2.2 CLOSURE AND PORT-CLOSURE

Throughout all phases of the Project, Baffinland will plan and conduct operations in a manner designed to return Project sites to a safe and environmentally stable condition. Baffinland will undertake progressive reclamation throughout the mine life. Temporary facilities required for the construction camps will be decommissioned and removed at the end of their useful life. Borrow areas, quarries, temporary roads and other disturbed sites will be stabilized to limit erosion of ground surfaces and rehabilitated once they are no longer required. Environmental and safety monitoring will continue as long as necessary to ensure that closure objectives have been met.

2.3 POTENTIAL FOR FUTURE DEVELOPMENT

The current Project has been designed for a nominal 21 Mt/a of iron ore. Provisions to accommodate future expansion of up to 30 Mt/a have been incorporated in the Project design. The development of Deposits No. 2 and No. 3, located next to Deposit No. 1, could readily be accommodated by the Project infrastructure with minimal additional cost. Additional trains and the construction of a second berthing at the Steensby Port ore dock would be required. The facilities at Milne Port could accommodate up to a nominal 5 to 6 Mt/a iron ore and the Milne Tote Road could support additional trucking. All Project sites are capable of accommodating additional stockpiles, material handling equipment and personnel associated with an expansion.

Regional exploration over the past two years has enabled Baffinland to identify five additional iron ore deposits (Deposits No. 5 through 9) that appear, based on surface sampling, to be of similar high-grade iron ore mineralization as the original deposits. While these other deposits have not yet been thoroughly evaluated, Baffinland's regional exploration program points to considerable potential for additional development. Having the mine and associated shipping, road, and railway infrastructure in place will facilitate future development in the region.

SECTION 3.0 - NEED FOR THE PROJECT

Iron ore is an essential commodity for ongoing growth and development of our society. Iron ore demand is projected to increase as the economies of China, India, and other emerging countries continue to expand and as the economies of western countries continue to improve. Baffinland proposes to develop the Project to supply high quality iron ore to world markets and provide an acceptable rate of return for its investors.

For the people of Nunavut, the Project will contribute to the development of infrastructure, skills training, employment, business opportunities, and will provide increased revenue to the Government of Nunavut and Inuit birthright corporations (Qikiqtani Inuit Association and Nunavut Tunngavik Inc.). The development of the Project is consistent with the Nunavut Planning Commission's broad planning principles, policies, and goals as well as the Nunavut Exploration and Mining Strategy. By increasing the business base in Nunavut, together with a better trained workforce, the Project should help to attract additional investment to the region.

The Project also contributes to Canada's northern strategy which consists of strengthening Canada's sovereignty in the North, protecting the country's environmental heritage, promoting economic and social development in the region, and improving Northern governance.

The Project is expected to bring many benefits to local communities, by supporting both traditional lifestyle of Inuit as well as the generational shift occurring in the Inuit community as youth show an interest to participate in the wage-based lifestyle. If the Project does not proceed, the mineral resource will not be developed, and the potential effects and benefits predicted in this EIS will not be realized.

SECTION 4.0 - PROJECT DEVELOPMENT PHILOSOPHY

Baffinland will carry out the Project in an environmentally and socially responsible manner. The needs and values of other resource users will be respected throughout development and operation of the Project. Baffinland will comply, and where it is economically and technically feasible, exceed Nunavut and federal regulatory requirements by applying technically proven and economically feasible environmental protection measures for each part of the Project.

A comprehensive Environmental, Health, and Safety Management System has been developed and is an integral part of the Project. The philosophy that underlies this environmental management system is the application of the precautionary principle and Baffinland's commitment to reduce and mitigate potentially adverse effects of its operations on its employees, residents of Nunavut, and the natural environment.

Baffinland has adopted employment and business principles that will guide the Company through the life of the Project. The philosophy underlying these principles is a commitment to maximize benefits that accrue to Nunavut in terms of direct employment and procurement expenditures.

Baffinland will strive to provide an employment climate that will attract, develop, and retain qualified personnel and maximize Inuit participation. To the extent possible, the company will hire employees from the five communities closest to the Project. Baffinland will work closely with the Qikiqtani Inuit Association (QIA) and other third parties to deliver necessary training to employees and support community programs which will enhance the beneficial effects of the Project and equip local residents with skills that will sustain them beyond the life of the Project.

The construction workforce will range in size from 3,000 to 5,700 persons. The estimated workforce during the operation phase is over 1,000 persons. Throughout the Project life, it is planned that workers from Nunavut communities will work a rotation of two weeks at the site followed by two weeks off. During the construction phase, southern workers will likely work the common remote-site construction schedule of four weeks on and two weeks off.
All workers will be transported to and from Project sites by air. Baffinland will provide air transportation from the five closest communities in the North Baffin region as well as from Iqaluit and Ottawa. Other locations may be considered as necessary.

4.1 PROJECT CHALLENGES

The development of a major mining project in a remote location of Nunavut faces several important challenges:

- High costs associated with building and operating a mine operation and transportation infrastructure in the arctic.
- Logistical challenges associated with the construction and operation of the facilities: limited seasonal access to the site and lack of existing transportation infrastructure.
- Long winters and extreme cold affects efficiency of construction crews and operations.
- Difficult geotechnical conditions (permafrost, ice lenses) require specialized design and construction techniques.

The competitive nature of the steel-making industry demands a steady, consistent, and secure supply of iron ore. In order to satisfy these requirements, the Project must ensure a reliable and consistent shipping

operation throughout the year. It is expected that one ship will load ore at Steensby Port every two days throughout the year, including the ice-covered period. Winter shipping of ore is essential and the Project includes a fleet of ice-breaking ore carriers capable of reliably meeting the shipping schedule.

The Project also faces two more important requirements:

- The Project must provide tangible benefits for Baffinland as well as Inuit landowners, local communities and land users.
- Baffinland's sole revenues depends on the world commodity prices for iron ore.

These factors have shaped Project design and execution strategy.

SECTION 5.0 - COMMUNITY INVOLVEMENT

Consultation with Project stakeholders has focused on the Inuit communities near the Project sites, and has included the public, local, and regional Inuit organizations, the Government of Nunavut, and the federal agencies with a mandate relevant to the Project.

Inuit of the Baffin Region enjoy a rich oral tradition. This tradition has influenced how Baffinland has engaged local communities. The company has focused on establishing a presence in the region, meeting with community members, and recording in-person discussions. Since the dominant language is Inuktitut, with regional dialects across Baffin Island, translation using local interpreters has been an important element during the consultation process.

Community acceptance and preferences were important factors considered in the evaluation of project alternatives such as the use of Milne Inlet, the location of the Steensby Port, the shipping route in the Foxe Basin and the work rotation schedule.

SECTION 6.0 - SETTING

The Project is located in the North Baffin region of Baffin Island in the territory of Nunavut in the Canadian Arctic. The Baffin Region of Nunavut has a rich and visible archaeological heritage dating to around 4,500 years ago.

6.1 PHYSICAL SETTING

Superficial landforms and deposits in the Mary River Project area are associated with widespread glaciation on Baffin Island. Surface geology consists of locally abundant sediment deposits from glaciers and rivers. Occasional outcrops of granitic and sedimentary rock formations occur. The North Baffin region containing the Mary River area lies within the Committee Belt, a granite-greenstone terrain mixed with sedimentary and volcanic rock. 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 Project is situated in the Northern Arctic Ecozone. The climate is semi-arid and permafrost coverage is continuous extending to a depth of 500 metres, with an active layer of up to 2 metres. 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 during the winter months. Due to the combination of low temperatures, low infiltration, the vegetative cover 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. Frost-free conditions occur from late June to late August. There is continuous daylight from May to August. The months of July and August usually experience the greatest precipitation. From September to November, temperature and the number of daylight hours decreases, and by mid-October the mean daily temperature is generally well below 0^{o}C. The highest snowfall typically occurs during this period.

Air quality and noise levels in the Project area are typical of remote environment. Freshwater quality measurements in the Mary River area indicate naturally elevated concentrations of dissolved oxygen, turbidity, aluminium, and iron. Some average values for pH, as well as cadmium and mercury in fresh water are greater than levels recommended by the guidelines of Canadian Council of Ministers of the Environment.

6.2 BIOLOGICAL SETTING

Vegetation is relatively sparse in much of the Project area and is generally consistent with flora of arctic regions. No plant species considered to be “rare” in Canada were found to occur in the survey locations.

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, and 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 regional study area was 1980 to 2000, and the previous period of low abundance was the 1940s. Caribou are expected to remain at low numbers for the next couple of decades. There is evidence that caribou occur throughout the entire region.

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.

Migratory bird species observed in the Mary River study area include snow geese, ducks, eiders, loons, and mergansers. Raptors found include rough-legged hawks, peregrine falcons, gyrfalcons, and snowy owls. Relatively low densities of songbirds and shorebirds were recorded throughout the region.

There are two fish species in the freshwater environment: arctic char and a minnow species named nine-spine stickleback. The inland waters near the Project mainly contain landlocked arctic char, though anadromous or searun char are present in a lake next to Steensby Port and up the Cockburn River system next to a portion of the railway. Fish in the marine waters captured during fisheries studies included arctic char, sculpin, and Atlantic lumpfish at Steensby Inlet, and Arctic char, sculpin, and Greenland cod at Milne Inlet.

6.3 SOCIO-ECONOMIC SETTING

Harvesting from the land (hunting, trapping, and fishing) is a key livelihood component for many residents of North Baffin. Supplementing the in-kind income generated through harvest activities, residents earn money through employment and various social transfers. Other income generating activities include arts and crafts, carving, prints, tapestries, and wall hangings. Residents have expressed enthusiasm for wage-based work, even when this means working in remote locations away from the community. The annual economic value of subsistence harvesting in Nunavut has been estimated to be between $30 million and $50 million a year. Estimates put the arts and crafts industry at more than $20 million per year, with more than 2,500 people deriving all or part of their income from this industry.

A limited wage economy exists in Nunavut, but there is a difference in the way residents participate; 60% of Nunavut's adult Inuit population is in the labour force, although 28% of that group is unemployed. Comparatively, nearly 91% of Nunavut's small non-Inuit population is in the labour force, with a 4% unemployment rate.

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. The public sector accounts for a large portion of Nunavut’s economic activity. Government jobs in administration, education, and health areas account for about half of all employment earnings in the territory. Construction has been growing as the government infrastructure has been established.

The Inuit of the North Baffin region have experienced tremendous social and cultural change over the course of a few decades. Recent changes, particularly residential schools, have affected family integrity and by implication, social cohesion. Elders are becoming more engaged in community life and in the learning of the younger generation. A shift toward western middle-class expectations appears to be taking place among Inuit youth.

The five communities of northern Baffin Island in the immediate vicinity of the Mary River Project, listed alphabetically, include Arctic Bay (280 km), Clyde River (415 km), Hall Bay (192 km), Igloolik (155 km), and Pond Inlet (160 km). Each of these communities has historical socio-economic and ecosystem ties to the Project area. These communities have a subsistence economy and 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 is causing social stress. Community Elders recognize that the communities must position themselves to enter the wage economy.

For many North Baffin households, harvest of country food provides an important contribution to overall well-being. In all five communities, caribou, ringed seal, and arctic char are of major importance. In addition, walrus is a major species of importance 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.

SECTION 7.0 - ISSUE SCOPING

The public consultations efforts have enabled Baffinland to identify the key interests and concerns of the communities and stakeholders of the Project. Extensive baseline studies were carried out to establish current site conditions. Interviews of Inuit Elders provided valuable insight into their traditional knowledge. These studies and consultation effort enabled the Project team to clearly identify the valued ecosystem components (VECs) and valued socio-economic components (VSECs) of the Project.

7.1 VALUED ECOSYSTEM COMPONENTS

The biophysical VECs are:

- landforms, permafrost, and the atmospheric environment;
- freshwater, including aquatic ecosystems, fish and fish habitat;
- land, including vegetation, caribou, and migratory birds; and,
- the marine environment, including marine water and sediment quality, marine and coastal physical habitat, marine fish and invertebrates, and marine mammals.

7.2 VALUED SOCIO-ECONOMIC COMPONENTS

The VSECs identified and evaluated for possible Project significant effects include population demographics, education and training, human health and well-being, substance abuse, community infrastructure, economics and employment, and culture and land use.

7.3 VECS AND VSECS INTERACTION WITH THE PROJECT

The interactions of the Project with the various VECs and VSECs were identified. Experience acquired by similar projects enabled the Project team to define the Project components in a manner that can avoid, reduce, or minimize potential adverse effects of the Project on the VECs and VSECs. The environmental assessment of the potential effects was used to guide Project decisions. Where negative Project interactions could not be avoided, plans were developed to limit or offset these effects.

Following adjustments and mitigation measures included in the Project to limit negative effects, residual effects of the Project were then assessed for their significance on the biophysical and socio-economic environments. The EIS presents the outcome of this assessment. The study complies with the NIRB directives and includes an assessment of transboundary effects as well as cumulative effects.

SECTION 8.0 - RESIDUAL EFFECTS ON VECS

8.1 LANDFORMS AND PERMAFROST

Sensitive landforms in the Project area mainly include frozen soils that contain ice lenses or soils of low bearing capacity. To the extent possible, sensitive landforms will be avoided and appropriate designs will be used where such landforms cannot be avoided. Site preparation will include adequate drainage to prevent water pooling during thaw periods. The residual effect of the Project on land features and permafrost are assessed as non significant.

8.2 AIR QUALITY

Ore handling, as well as driving on access roads, and emissions from power plants, trucks, and camp incinerators will reduce air quality, and generate noise. Air pollution controls such as dust suppressants, enclosing facilities and the use of dust-collection equipment will prevent significant effects on air quality. Use of mufflers and regular maintenance of engines and equipment will prevent significant noise effects. The residual effect of the Project on air quality, noise, and vibration is assessed as not significant.

8.3 EFFECTS OF CLIMATE CHANGE AND GREENHOUSE GASES

Global warming is predicted to have little effect on the very cold and deep permafrost conditions in the mine site area over the planned life of the Project. The project facilities will be conservatively designed to account for changes in site conditions induced by climate change. As a result, the impact of climate change on the Project is assessed as not significant.

Over the life of the Project, the production of greenhouse gas is estimated at 12.4 Mt of CO_2 which corresponds to annual emissions of 0.443 Mt equivalent. This corresponds to 0.0211 Mt per tonne of iron ore. Although significant for Nunavut, these emissions are not significant on a national scale.

8.4 FRESHWATER QUALITY, AQUATIC ECOSYSTEMS, FISH AND FISH HABITAT

A number of proven mitigation measures have been included in the Project to reduce potential effects on water quality, freshwater fish, fish habitat, and other aquatic organisms. These mitigations are detailed in the Site Water Management Plan, Wastewater Management Plan, Waste Management Plan and Emergency and Spill Response Plan.

Runoff from fuel storage and maintenance facility areas will be contained and treated as necessary to meet regulatory requirements. Sewage and wastewater from truck and rail maintenance facilities, and explosives equipment-washing facilities will be treated to meet established standards before being discharged to the natural environment. An Emergency and Spill Response Plan will be in place to promptly clean up spills should they occur.

The roads and railway both cross a large number of watercourses, and a portion of these contain fish habitat. Culverts and bridges for stream and river crossings will be designed to limit barriers to fish movement and where possible, minimum flows will be maintained in streams important for fish habitat. Because railways cannot turn sharp corners, building sections of the railway into the edge of several lakes will be unavoidable. While some fish habitat will inevitably be lost, a compensation plan has been proposed to offset this unavoidable loss. This plan will be further developed and finalized in consultation with Fisheries and Oceans Canada and the Qikiqtani Inuit Association.

As a result of these actions, the residual effect of the Project on water quantity, water and sediment quality, aquatic ecosystems, freshwater fish and fish habitat is assessed to be not significant.

8.5 VEGETATION, TERRESTRIAL WILDLIFE AND MIGRATORY BIRDS

Project facilities have been made compact to minimize the Project footprint and dust suppression techniques will be used to limit dust emissions. As a result, the residual effects of the Project on vegetation are assessed as not significant.

Accidental kills of caribou could occur as a result of Project activities. These numbers are expected to be limited to individuals and will be not be significant compared with total numbers in the region. Several measures are in place to avoid caribou kills. Strict speed limits will be in place for trucks and trains, thus decreasing the probability of collision. Trucks will be required to stop if wildlife is observed on or next to the road. Trains cannot stop to avoid collisions with caribou, but during seasons when large herds of caribou return, the train can cease operation until caribou move through the area. Crossings will be provided at strategic locations along the railway corridor to facilitate migration of animals. Workers onsite will not be permitted to hunt. As a result of these proactive measures, the residual effect of the Project on the caribou population is assessed as not significant.

An insignificant amount of habitat loss for migratory birds is expected to result from Project activities. Effects on populations of peregrine falcons, snow geese, eiders, and loons will not be significant. Nests and nesting areas will be identified before start of activities and avoided where possible until fledging occurs, and workers are not permitted to hunt. As a result of these proactive measures, the residual effect of the Project on the migratory bird population is assessed as not significant.

8.6 MARINE ENVIRONMENT

No significant effects of Project activities are predicted on marine water and sediment quality, marine and coastal physical habitats, and marine mammals. All sewage and wastewater from maintenance facilities and explosives will be treated before discharge at the two ports. Runoff from Project areas will be contained, monitored, and treated to meet water effluent quality requirements before discharge. No waste will be discharged into the sea by ships. Fuel transfers will take place following the *Canada Shipping Act* Response Organization and Oil Handling Facilities Regulation and Project Oil Handling Facility Plans for ship-to-land fuel transfer and Project Shipboard Oil Pollution Emergency Plans. In addition, ships are required to exchange ballast water at sea before entering Canadian waters. Such practices will limit the risk of introduction of invasive species. As a result of these mitigation measures, the residual effect of the Project on marine water, marine sediments, and marine habitats is assessed as not significant.

8.7 MARINE MAMMALS

The marine mammals of concern include ringed seals, walruses, narwhals, beluga whales, and bowhead whales.

The marine mammals of concern include ringed seals, walruses, narwhals, beluga whales, and bowhead whales.

Ringed seals are present year-round along both proposed shipping routes. The stable landfast ice offers preferable seal habitat for making breathing holes and lairs. Females give birth in March and April and nurse their pups for five to eight weeks. During the open-water period seals disperse. Ringed seals are generally quite tolerant of on-ice industrial activity and shipping. However, ringed seals are thought to be susceptible to disturbance during periods when they are giving birth and nursing their pups. Icebreakers will change a

small proportion of landfast ice in Steensby Inlet along the shipping corridor and at the dock site. Small numbers of ringed seal mortalities could occur as a result of icebreaking activity. The interaction of the Project with the ringed seal population will be limited to the shipping activity and as a result, the residual effect of the Project on the ringed seal population is assessed as not significant.

Walruses occur year-round in the marine study area and are present in relatively high numbers in northern Foxe Basin. Animals summer around Jens Munk, Koch, Rowley, and the Spicer islands where they haul out, and move into Foxe Channel during winter. The degree to which walruses are present in Steensby Inlet is uncertain but traditional knowledge reports that walruses regularly are present there in small numbers. Walruses also occur in Hudson Strait. Very few walruses are present along the shipping route in Eclipse Sound and Milne Inlet. Along the southern shipping route, walruses in the open-water or hauled out on ice might respond to passing vessels several kilometres away. Walruses at terrestrial haul-out sites are not predicted to be affected by Project activities. The interaction of the Project with the walrus population will be limited to the shipping activity and as a result, the residual effect of the Project on the walrus population is assessed as not significant.

Narwhals are present along the northern shipping route primarily during the open-water period, and about 20,000 animals summer in the Eclipse Sound and Milne Inlet area. Narwhals are thought to calve and feed in this summering area. A much smaller number of narwhals are present along the southern shipping route. Relatively few narwhals have been present in Foxe Basin but narwhals are thought to overwinter in the eastern portion of Hudson Strait. There have been relatively few studies of the effects of shipping on narwhals. Based on limited observations in the Project area, narwhals do not seem to respond to vessels (including the passage of an ore carrier) in Eclipse Sound and Milne Inlet to the same extent as responses documented during a 1982–1984 icebreaking study. The interaction of the Project with the narwhal population will be limited to the shipping activities in Milne Inlet during the open water season and as a result, the residual effect of the Project on the narwhal population is assessed as not significant.

Beluga whales occur in the RSA year-round. Relatively small numbers of belugas are present in Eclipse Sound and Milne Inlet during the open-water period. Hudson Strait has been identified as an overwintering area for three populations of beluga. In Foxe Basin, small numbers of belugas are present in the vicinity of Igloolik, Hall Beach, and likely Steensby Inlet during July to early September. Studies show that belugas avoid icebreakers and vessels travelling in areas of ice at greater distances than vessels travelling in open water. It is possible that belugas will habituate to frequent shipping, including ice breaking. The interaction of the Project with the beluga whale population will be limited and as a result, the residual effect of the Project on the beluga whale population is assessed as non significant.

Bowhead whales are present seasonally in different areas of the RSA throughout the year. About 6,300 bowhead whales are estimated in the stock that is present in the study area. Along the proposed northern shipping route, bowhead whales are present during summer and fall. Bowheads congregate to feed and nurse calves in spring and summer around Southampton Island, along the western Hudson Bay coast, and in a relatively small area in northern Foxe Basin between Igloolik and Fury and Hecla Strait. A bowhead nursery area has been identified in this small area in northern Foxe Basin. Hudson Strait has been identified as a primary wintering area. Based on studies of bowhead response to ships and icebreakers, bowheads will likely avoid at least the immediate area around ships. The interaction of the Project with the bowhead whale population will be limited and as a result, the residual effect of the Project on the bowhead whale population is assessed as not significant.

8.8 POLAR BEAR

Polar bears occur in the RSA throughout the year and are abundant in northern Foxe Basin, including the shorelines of Steensby Inlet and Koch, Rowley, and Bray islands. Information on the location of denning areas has not been published, but Hall Beach Elders noted that the southeastern portion of Steensby Inlet provides good denning habitat. Polar bears also overwinter in Hudson Strait. Small numbers of polar bears are expected to be present in Milne Inlet and Eclipse Sound during the open-water period. Polar bears might avoid or approach ships and port sites. Project personnel will be educated about bear safety. Strict management of waste will reduce the chances of human-bear interactions. Polar bear monitors will be used to ensure worker safety. The interaction of the Project with the polar bear population will be limited and as a result, the residual effect of the Project on the polar bear population is assessed as not significant.

SECTION 9.0 - RESIDUAL EFFECTS ON VSECS

9.1 POPULATION DEMOGRAPHICS

The possible migration of non-Inuit employees into North Baffin was a noted concern in the communities. The potential for the Project to cause non-Inuit in-migration, as well as the potential for Inuit to move out of the communities as a result of the Project was assessed relative to preservation of the community social fabric. None of these possibilities was identified as significantly affecting the composition and numbers of the North Baffin populations. The residual effect of the Project on population demographic is assessed as not significant.

9.2 EDUCATION AND TRAINING

The Project will have a significant positive effect on education and training. Baffinland's education and training commitments will help upgrade the skills of North Baffin residents. A minimum age of 18 for Project employment will serve as an incentive for students to complete high school. Experience gained at work will also help improve life skills. The residual effect of the Project on education and training will be positive and significant.

Baffinland is also committed to supporting training programs that will enable residents of nearby communities to develop the skills needed to qualify and perform jobs at every level of the Project operation. To this end, the company has been actively pursuing education and training partnerships initiatives. Baffinland, the QIA, Qikiqtaaluk Corporation, and Kakivak Association have agreed to develop and promote the delivery of mine-related training, training related to economic and community development, labour market research, curriculum development, career development, and other related activities for the benefit of Inuit in the communities associated with the Project. A similar agreement has been signed with the Government of Nunavut and Arctic College, focusing on trades programs.

9.3 HUMAN HEALTH AND WELL-BEING

The Project will have significant positive effects on human health and well-being, including local food security. The challenges associated with fly-in/fly-out work are recognized. Steps will be taken to help workers and families to succeed in this work. Orientation and training will be provided to help workers and families adapt to the work rotations, and orientation and training related to health and well-being and money management will be offered. The shorter work rotations will limit the period of absence of workers from their families and communities and provide opportunities for them to integrate traditional activities with work at the Project. The Project is not expected to release contaminants into the environment, causing human health concerns. The residual effect of the Project on human health and well-being is assessed as positive and significant.

9.4 SUBSTANCE ABUSE

The effect of the Project on the transport of illegal substances through Project sites, on affordability of such substances, and attitudes toward substances and addictions is unclear. To counter the possibility of these negative effects, the company has a strict no drug–no alcohol policy. Drugs and alcohol are not permitted on worksites and addiction counselling will be available. Given the pro-active education programs proposed by Baffinland, the overall residual effect of the Project on substance abuse will be positive and significant.

9.5 COMMUNITY INFRASTRUCTURE AND PUBLIC SERVICE

The Project could create competition for skilled workers. Early skills training will be made available through the education and training partnerships established by Baffinland. This will increase the number of skilled workers available for work at the Project and in the community. As a result, competition for workers is not expected to significantly affect local services.

The employment experience and ongoing training provided by the Project will significantly improve labour force capacity in North Baffin and Nunavut over time, helping to equip local residents with the qualifications and experience needed to successfully compete for jobs requiring post-high school skills training and education. In addition, Baffinland will help Inuit firms, and in particular smaller Inuit firms from communities in the Baffin Region develop capacity to bid on and carry out contracts for the Project. The company will also encourage contractors to break down large subcontracts into smaller components and will work with QIA or a QIA subsidiary organization to establish a Business Capacity and Start-Up Fund.

Apart from the use of airstrips at the five nearest communities for transporting workers to and from worksites, few direct effects on services and infrastructure in the North Baffin communities are expected. Some increased demand for infrastructure is expected to arise due to the Project. For example, increased wealth might lead to more vehicles and a need for road improvements.

The residual effect of the Project on community infrastructure and public service is assessed as positive and significant.

9.6 GOVERNANCE AND LEADERSHIP

Education and training provided by Baffinland partnership initiatives as well as on-the-job work experience and counselling will develop leadership skills that will significantly improve local governance. The participation of community residents and leaders in agreement negotiations with Baffinland and in initiatives to identify key indicators for regional monitoring programs has also contributed to local community leadership development. The residual effect of the Project on governance and leadership is assessed as positive and significant.

SECTION 10.0 - EFFECTS ON NUNAVUT ECONOMY AND EMPLOYMENT

In general, the Project will produce significant positive results on livelihood and employment, economic development and self-reliance, contracting and business opportunities, benefits, taxes, and royalties.

The Project will have a significant positive effect on the economy of the region and Nunavut. About $4.1 billion will be invested in Project development. The Project will produce iron ore worth about $23 billion and pay more than $2.8 billion dollars in profits taxes to the Government of Nunavut over 21 years. More than $1.9 billion in royalties will flow to Nunavut Tunngavik Incorporated (NTI) over the life of the Project. By comparison, the Government of Nunavut's revenue from all sources was $1.3 billion in 2007. The residual effect of the Project on the economy of Nunavut is assessed as positive and significant.

The Project will produce a significant positive effect on livelihood and employment in the project development area. It will employ local residents where possible and provide job progression and career advancement opportunities. The amount of money spent on labour over the life of the Project is estimated at $1.7 billion, providing approximately 21,080 person years of employment over the Project life.

The estimated workforce on shift during the four-year construction phase will range from 3,000 to 5,700 persons, including both onsite and offsite personnel. The total estimated workforce on shift during the 21 year operation phase is 1,057, including both onsite and offsite personnel, and Baffinland and contract personnel, but not including exploration staff estimated at about 150 workers, nor workers on ships. The residual effect of the Project on employment is assessed as positive and significant.

10.1 ECONOMIC DEVELOPMENT AND SELF-RELIANCE AND BUSINESS OPPORTUNITIES

Business opportunities could increase through the supply of business services to the Project and indirectly through an expanded market for consumer goods and services. The Project will have a positive significant effect on economic development and self-reliance of individuals, communities, and the territory. The residual effect of the Project on economic development, self reliance, and business opportunities is assessed as positive and significant.

10.2 CULTURE AND LAND USE

Measures will be taken to respect and preserve the culture of Inuit employees while they are working. Policies that encourage respect of other cultures are in place and Baffinland supports the use of Inuktitut onsite, for signage and work parties. Traditional country foods will be provided in the company cafeterias. Policies encouraging safety, employment equity, and, preventing harassment will be strictly enforced.

Archaeological sites have been identified in Project areas that contain features and artifacts representing substantial degrees of area use throughout the human past to the present. A number of important archaeological sites will be avoided by relocating Project infrastructure, and others will require protection through excavation, mapping, and artifact retrieval by a licensed archaeologist. Baffinland's Cultural Resources Management Plan outlines the policies and procedures for management of archaeological sites. Given this pro-active approach, the residual effect of the Project on cultural resources is assessed as positive and significant.

The Project will interact with existing land uses by Inuit, namely travel overland and on landfast ice, wildlife harvesting, and extraction of other resources such as soapstone. Measures have been identified so that the Project can accommodate pre-existing land uses. These measures include check-in procedures at project sites and a road management plan that will focus on public safety for the Milne Inlet Tote Road and the

railway. The ship track through the landfast ice in Steensby Inlet is expected to affect existing on-ice travel routes during the winter. To mitigate this, Baffinland proposes to establish a clear and safe detour route around the port site. Baffinland will also accommodate travellers at Steensby Port and provide meal and additional gas as required by the transient hunters. Baffinland also remains open to working with the communities in order to evaluate options for establishing ship-track crossings and other safety measures. Given these pro-active measures, the residual effect of the Project with respect to current land use is assessed as not significant.

The Project will also interact with marine mammals and caribou that are important harvest species to local communities. Based on the assessment, the Project is expected to have a negligible effect on harvesting of wildlife. The residual effect of the Project on harvesting activities is assessed as not significant.

Mary River soapstone is an important resource in the region, and this soapstone deposit is located near the mining area. Special arrangements will be made for Inuit from the communities to safely access the soapstone. It is expected that these arrangements will improve accessibility of this important resource. The residual effect of the Project on the exploitation of this resource by Inuit is assessed as positive.

SECTION 11.0 - ENVIRONMENTAL, HEALTH AND SAFETY MANAGEMENT

Baffinland is committed to protection of the health and safety of employees and the environment, and to ongoing community involvement and participation in the Project. The company embraces the principle of Social Responsibility as outlined by the emerging voluntary standard of the International Standards Organization, *Guidance for Social Responsibility.* The Project will be carried out in conformance with applicable Nunavut and Canadian laws, regulatory requirements, agreements, permits, and licences. In addition, on conclusion of the EIS process, Baffinland will complete an Inuit Impact and Benefits Agreement (IIBA) under negotiation with the QIA.

Baffinland's Environment, Health, and Safety (EHS) Management System is the framework for management plans that that have been developed to address all aspects of the company's activities. These plans document the conclusions of the EIS and relevant commitments and requirements for each phase of the Project. Each management plan targets a specific VEC or VSEC and contains the detailed mitigation measures and monitoring to be implemented throughout the life of the Project in order to eliminate, limit or minimize adverse effects. All Baffinland employees and contractors are required to comply with these management plans. The reporting and documentation requirements for these management plans, auditing, and process of management review and revisions are specified in the EHS Management System.

The accountability for safety and environmental protection is shared among all employees and contractors and Baffinland is committed to providing the necessary training and awareness programs for effective implementation of its policies and management plans. These training programs will be documented, procedure manuals will be maintained, and retraining schedules will be established. Baffinland's Human Resource Management Plan outlines these commitments.

SECTION 12.0 - TRANSBOUNDARY AND CUMULATIVE RESIDUAL EFFECT

In accordance with EIS guidelines, the Project potential and residual transboundary and cumulative effects were assessed. The EIS concludes that both the transboundary residual effects and the cumulative effects of the Project are not significant.

SECTION 13.0 - RESIDUAL CONCERNS OF THE COMMUNITIES

13.1 WINTER SHIPPING

The community comments relating to the proposed shipping route through Foxe Basin and Hudson Strait have been taken into account in the assessment of the marine environment and Baffinland has adopted a number of measures to ensure the safety and reliability of winter shipping.

Although year round shipping in the Arctic is not currently done in the Canadian Arctic, year round shipping is a well established practice in Russia and the Scandinavian countries. Intermittent winter shipping has taken place with the Polaris Mine and the Nanisivik Mine and has steadily increased since the establishment of the Raglan and Voisey Bay mines. Based on worldwide practices and recent Canadian experience acquired with winter shipping, Canada is now poised to commence this activity on a larger scale.

13.2 SOCIAL CHANGES

The socioeconomic benefits offered by the Project will inevitably trigger social changes for the Inuit of the neighbourhood communities and Nunavut as a whole. The increased purchasing power of employees as well as the redistribution of wealth generated by Project activities has the potential to accelerate the changes currently being experienced by the Inuit society and families. Although such changes are inevitable and will continue to occur, with or with the Project, the rate and direction of such changes remain legitimate concerns for many Inuit.

However, the rapid population growth over the last 20 years (70% of the population under the age of 25) requires adaptation. It is generally acknowledged that the traditional lifestyle and subsistence living cannot be maintained by the rapidly increasing population without bringing undue stress to the natural environment. Underemployment and lack of opportunities is causing social stress. Furthermore, a shift toward western middle-class expectations appears to be taking place among Inuit youth. Community Elders recognize that the communities must position themselves to enter the wage economy and Elders are becoming more engaged in community life and in the learning of the younger generation. Many Inuit view the Project as a mean of achieving a balance between a wage economy and the traditional subsistence life style.

SECTION 14.0 - CONCLUSIONS OF THE EIS

The EIS for the Mary River Project includes a thorough environmental impact assessment of Project development plans. The EIS is based on extensive studies of the biophysical and socio-economic environments. Many consultations have been undertaken to identify and address the concerns and interests of local communities, regulatory agencies, and other interested stakeholders and to benefit from the Inuit knowledge of the Elders in the region. The EIS has addressed the topics identified by NIRB in the guidelines provided for the Project.

The Project will be designed to meet all relevant regulatory requirements and to avoid, limit, and, minimize negative effects where possible and to enhance socio-economic benefits. Baffinland is confident that it has proposed a Project that will provide positive economic returns to investors and benefits to the people, the Government of Nunavut, and Inuit organizations. A comprehensive management and monitoring system has been developed to ensure that the commitments in the EIS will be respected. Baffinland is committed consultations with stakeholders and address public concerns throughout the life of the Project.

No Significant Negative Impacts on the Biophysical Environment

The environmental assessment concludes that residual effects of the Project on the valued ecosystem component (VECs) of the biophysical environment will be not significant.

Concerns have been expressed over the possibility of large diesel spill associated with refuelling of the Project tank farms. In the unlikely event that it occurs, such a spill would have significant environmental effects. However, refuelling is a well mastered routine activity for all Arctic communities. For the Project, fuel will be delivered to site by tankers only during the open water season.

Table 1 presents a summary of the Project residual effects on the VECs.

Positive Socio-Economic Impacts

Assessments of potential effects on the socio-economic environment have concluded that there will be significant positive effects on local employment and skills development and that significant revenue will accrue to the Government of Nunavut. These positive effects are expected to result mainly from employment of local residents and payment of Baffinland revenue to government and Inuit organizations. Other effects could occur from Baffinland's procurement of goods and services from northern businesses, and interactions with local hunters through various project operations such as shipping.

A major Project benefit will be a growing territorial economy that will decrease economic instability in Nunavut. Increasing the number of ongoing mining projects in Nunavut will help stabilize the territorial economy.

The Project will generate benefits to local Inuit communities through capacity-building, employment, and business opportunities, and revenue to the territorial and federal governments in the form of tax revenue. The IIBA, currently under negotiation between Baffinland and the regional Inuit association, will ensure that benefits from the Project flow to nearby Inuit communities and the Qikiqtani Region of Nunavut.

Table 2 presents a summary of the Project residual effects on the VSECs.

ATMOSPHERIC ENVIRONMENT					
Valued Ecosystem Component	**Key Indicator**	**Potential Effect(s)**	**Mitigation Measures**	**Residual Effect(s)**	**Significance Rating**
Climate change	Greenhouse Gases (GHG)	• Increased GHG emissions • Climate change	• Arctic grade diesel fuel • Rail transportation of ore	• Increased GHG emissions	Not significant
Air quality	Air quality	• Increased concentrations of: o Total Suspended Particulate (TSP), Inhalable Particulate Matter (PM10), sulphur dioxide (SO_2), nitrogen dioxide (NO_2), and carbon monoxide (CO). • Increased deposition of: o Dust, metals, potential acid input (PAI).	• Apply best management practices for limiting air emissions • Use of low sulphur arctic grade diesel fuel • Limit speed on roads • Ore crushing facilities are enclosed, vented and equipment with dust collection equipment • Apply dust suppressant as required in high traffic areas and stockpiles • Procurement policy on emissions from equipment (incinerator, generators, vehicles) • Waste segregation (incineration) • Where possible, use of granular material for road construction • Regular maintenance of equipment and vehicles	• Increased concentrations of: o Total Suspended Particulate (TSP), Inhalable Particulate Matter (PM10), sulphur dioxide (SO_2), nitrogen dioxide (NO_2), and carbon monoxide (CO). • Increased deposition of: o Dust, metals, potential acid input (PAI).	Not significant
Noise and vibration	Noise and vibration levels	• Sensory impact on wildlife	• Procurement policy for noise for equipment and vehicles • Use of mufflers – regular maintenance of engines and equipment	• Sensory impact on wildlife	Not significant

TERRESTRIAL ENVIRONMENT					
Valued Ecosystem Component	**Key Indicator(s)**	**Potential Effect(s)**	**Mitigation Measures**	**Residual Effect(s)**	**Significance Rating**
Landforms, soil and permafrost	Sensitive landforms	• Soil contamination • Soil structure alteration • Soil destabilization and erosion • Thaw weakening and settlement • Creep settlement	• Siting of facilities and alignment of roads and railway • Design foundations suitable for site conditions • Design stream crossing structures for extreme flood event • Ensure adequate drainage and prevent pooling of water	• No residual effect (disturbance of sensitive landforms) after mitigation	Not significant
Vegetation	Vegetation	• Loss of vegetation abundance and diversity	• Limit physical footprint of facilities • Limit areas of access for vehicles • Progressive reclamation / closure	• Loss of vegetation limited to Project Development Areas (PDA)	Not significant
Birds	Peregrine falcon Snow geese Eider Red-throated loon	• Destruction of nests • Habitat loss • Mortality • Influences on health • Sensory disturbance	• Employee awareness / environmental induction program • Minimize footprint of facilities • Conduct nest search prior to start of activities • No hunting policy • Avoidance of areas of large concentrations of foraging or moulting birds • Avoidance of known nests or nesting areas • To the extent possible, enforce closure of a 500 m radius of the nest until fledging occurs • Nest-specific management plans • To the extent possible, develop appropriate aircraft approach and departure flight paths • Refer to mitigation measures outlined in Appendix 10D-11 Terrestrial Environment Management Plan	• Habitat loss • Mortality • Influences on health	Not significant

TERRESTRIAL ENVIRONMENT					
Valued Ecosystem Component	**Key Indicator(s)**	**Potential Effect(s)**	**Mitigation Measures**	**Residual Effect(s)**	**Significance Rating**
Terrestrial wildlife and habitat	Caribou	• Habitat loss • Restriction of movement • Mortality	• Use of dust suppressant on Tote Road during growing season • Speed limits for trucks and trains which will provide more time for caribou to get off the road or rail, and will increase the chance of a truck being able to stop before a collision with a caribou. • The train is expected to operate 300 days per year, so seasonal stoppages are possible if large groups of migratory caribou return to the area. • Baffinland has a no hunting policy for all personnel while working on site. • Snow management that will grade snow banks along railway and roadway so that caribou are able to easily cross the transportation corridor without being blocked by steep snow banks. • The railway embankment will be constructed of finer fill material at the five identified trails for easier caribou movement across the railway embankment. The finer fill will replicate natural trail conditions. • Physical barriers from trains will be reduced by limiting train traffic to four passes per day.	• Habitat loss • Restriction of movement • Mortality	Not significant

FRESHWATER AQUATIC ENVIRONMENT					
Valued Ecosystem Component	**Key Indicator(s)**	**Potential Effect(s)**	**Mitigation Measures**	**Residual Effect(s)**	**Significance Rating**
Water quantity	Water quantity	• Reductions in water quantity due to water withdrawals • Increases in water quantity due to effluent discharges • Redistribution of water flows in the natural environment due to diversions	• Permit required for water withdrawal • Measurement of withdrawal quantities as per Water License • Implement measures to reduce water consumption	• Redistribution of water flows in the natural environment due project use	Not significant
Surface water and sediment quality	Water and sediment quality	• Changes in water quality due to point-source, non point-source and airborne emissions • Changes in sediment quality due to point-source, non point-source and airborne emissions	• Siting of facilities/quarries at least 30 m from stream or water body • Install range of sediment and erosion control structures • Install diversion/collection channel or containment berms where appropriate • Routine inspection and maintenance • Ice and freshet management • Implementation of BMPs for surface water management • Sewage treatment • Wastewater treatment plant (oily water, truck wash, maintenance facilities, explosives equipment wash water) • Management of potentially acid generating rocks from waste rock pile, ore stockpiles, quarries and mine	• Changes in water quality due to point-source, non point-source and airborne emissions • Changes in sediment quality due to point-source, non point-source and airborne emissions	Not significant

FRESHWATER AQUATIC ENVIRONMENT					
Valued Ecosystem Component	**Key Indicator(s)**	**Potential Effect(s)**	**Mitigation Measures**	**Residual Effect(s)**	**Significance Rating**
			• Minimize footprint of stream crossing • Compensation plan for HADD • Appropriate design of stream/river crossing structures (culvert, bridges, etc.) • Limit barrier to movement with site specific design of rocky ramps at culvert crossing (where required) • Channel enhancement where required • Maintain minimum flow in impacted streams where possible • Monitor low flow stream, fish salvage if necessary • Fish barrier for extremely low flow streams • Use of explosives in or near streams/water bodies as per DFO Guidelines • Prevent discharge of contaminants • All hazardous materials stored on impermeable surface/secondary containment • Tank farm and large storage tanks placed in secondary containment structures (lined and impermeable) • Smaller tank – double wall iso-containers • Refuelling on impermeable surfaces and runoff contained • Emergency and Spill Response Plan		

FRESHWATER AQUATIC ENVIRONMENT					
Valued Ecosystem Component	**Key Indicator(s)**	**Potential Effect(s)**	**Mitigation Measures**	**Residual Effect(s)**	**Significance Rating**
Freshwater fish, fish habitat, and other aquatic organisms	Arctic char	• Effects on Arctic char health • Effects on Arctic char movement • Effects on Arctic char habitat quality • Arctic char mortality	• Siting of facilities/quarries at least 30 m from stream or water body • Install range of sediment and erosion control structures • Install diversion/collection channel or containment berms where appropriate • Routine inspection and maintenance • Ice and freshet management • Implementation of BMPs for surface water management • Sewage treatment • Wastewater treatment plant (oily water, truck wash, maintenance facilities, explosives equipment wash water) • Management of potentially acid generating rocks from waste rock pile, ore stockpiles, quarries and mine • Minimize footprint of stream crossing • Compensation plan for HADD • Appropriate design of stream/river crossing structures (culvert, bridges, etc.) • Limit barrier to movement with site specific design of rocky ramps at culvert crossing (where required) • Channel enhancement where required • Maintain minimum flow in impacted streams where possible • Monitor low flow stream, fish salvage if necessary • Fish barrier for extremely low flow streams	• Effects on Arctic char health • Effects on Arctic char movement • Effects on Arctic char habitat quality • Arctic char mortality	Not significant

FRESHWATER AQUATIC ENVIRONMENT					
Valued Ecosystem Component	**Key Indicator(s)**	**Potential Effect(s)**	**Mitigation Measures**	**Residual Effect(s)**	**Significance Rating**
			• Use of explosives in or near streams/water bodies as per DFO Guidelines • Prevent discharge of contaminants • All hazardous materials stored on impermeable surface/secondary containment • Tank farm and large storage tanks placed in secondary containment structures (lined and impermeable) • Smaller tank – double wall iso-containers • Refuelling on impermeable surfaces and runoff contained • Emergency and Spill Response Plan		

MARINE ENVIRONMENT					
Valued Ecosystem	**Key Indicator(s)**	**Potential Effect(s)**	**Mitigation Measures**	**Residual Effect(s)**	**Significance Rating**
Sea ice	Fast ice	• Disruption of shore fast ice in Steensby Inlet • Potential change to timing of shore fast ice break up and formation	• Minimize width of shipping lane through fast ice to the extent possible	• Disruption of shore fast ice along shipping route in Steensby Inlet	Not significant
Marine water and sediment quality	Marine water and sediment quality	• Changes in water and sediment quality in Steensby and Milne Inlets • Accident and malfunction (e.g. oil spill)	• Site runoff water management as per management plan • Hazardous substances contained within impermeable areas as per Waste Management Plan • Sewage treatment and wastewater treatment plant (oily water, truck wash, maintenance facilities, explosives equipment wash water) • Emergency and Spill Response Plan, Milne Port OPEP and Steensby Port OPEP; SOPEP for all ships • Ship on-board waste management - no discharge at sea	• Changes in water and sediment quality in Steensby and Milne Inlets • Accident and Malfunction	Not significant
Marine habitat and biota	Marine habitat	• Disruption of marine coastal habitat	• Minimize footprint of marine structures	• Loss marine coastal habitat for ports	Not significant
	Arctic char	• Effects on Arctic char health, habitat quality, and mortality	• Minimize footprint of marine structures • Compensation plan for HADD • Appropriate design of marine structures	• Effects on Arctic char health and habitat	Not significant

MARINE ENVIRONMENT					
Valued Ecosystem	**Key Indicator(s)**	**Potential Effect(s)**	**Mitigation Measures**	**Residual Effect(s)**	**Significance Rating**
Marine mammals	Ringed seals	• Habitat change resulting from icebreaking and/or ice management • Disturbance caused by airborne and/or underwater noise from construction, shipping, and aircraft • Hearing impairment and/or damage caused by noise from construction activities • Masking of environmental sounds caused by vessel and construction noise • Mortality from collisions with vessels and blasting during construction	• Dock structures were designed to minimize the footprints in the marine environment • Schedule dock construction activity during period of low mammal occurrence – April to June (blasting, pile driving, dredging) • Use proven mitigation measures to mitigate noise during construction (DFO's guideline of 100 kPa overpressure limit, bubble curtain system for blasting) • Discourage marine mammals from the blast area with potential use of acoustic deterrent device • Vessels will maintain a constant course and speed whenever possible - reduce vessel speed in Milne Inlet • Vessels will minimize idling of engines when docked at Milne and Steensby ports • Aircraft will be operated at a minimum altitude of 450 m over marine areas, when weather conditions allow • Aircraft will be prohibited from flying low over marine mammals for sightseeing or photography • Primary use of Mary River airstrip during the Operation Phase • Educate workers about bear safety • Work areas kept clean of food scraps, garbage, and toxic materials • Use of bear monitor at camp sites • Use of bear deterrent devices	• Habitat change from icebreaking and/or ice management • Disturbance caused by noise from construction, shipping, and aircraft overflights • Mortality from icebreaking • Masking caused by shipping noise	Not significant
	Walruses				Not significant
	Beluga whales				Not significant
	Narwhals				Not significant
	Bowhead whales				Not significant
	Polar bears	• Habitat change resulting from icebreaking and/or ice management • Disturbance caused by noise from construction, shipping, and aircraft • Mortality from human-bear interactions		• Habitat change from icebreaking and/or ice management • Disturbance caused by noise from construction, shipping, and aircraft overflights • Mortality if a bear is killed in defence of human life	Not significant

HUMAN ENVIRONMENT					
Valued Socio-Economic Component	**Key Indicator(s)**	**Potential Effect(s)**	**Mitigation Measures**	**Residual Effect(s)**	**Significance Rating**
Population demographics	Demographic stability	• In-migration of a small number of workers from south will have effect on the demographic make-up of communities • Migration of non-Inuit Project employees into the North Baffin LSA • Migration of non-Inuit into North Baffin for indirect jobs • Inter-community Inuit migration • Out-migration from the North Baffin	• Designation of North Baffin communities as "Point of Hire" (Arctic Bay, Clyde River, Hall Beach, Igloolik, and Pond Inlet) • Iqaluit and Ottawa are also designated "Point of Hire" • Free transportation from "Point of Hire" to Mine Site	• In-migration of a small number of workers from south or other Nunavut communities will have effect on the demographic make-up of communities	Not significant
Education and training	Life skills	• Improved life skills amongst many LSA residents	• Job readiness training • Supportive work environment • "Second chance" hiring policy • "No drug, no alcohol" policy	• Improved life skills amongst many LSA residents	Significant - positive
	Schooling	• Incentives related to school attendance and success	• Minimum age of 18 yrs for Project employment • Career planning • Priority hiring for Inuit	• Incentives related to school attendance and success	Significant - positive
	Skills	• Opportunities to gain skills	• Upgrading opportunities • Summer experience • Career counselling • Training MOU	• Opportunities to gain skills	Significant - positive

HUMAN ENVIRONMENT					
Valued Socio-Economic Component	**Key Indicator(s)**	**Potential Effect(s)**	**Mitigation Measures**	**Residual Effect(s)**	**Significance Rating**
Human health and well-being	Substance abuse	• Transport of substances through Project sites • Affordability of substances • Attitudes towards substances and addictions	• "No drug – no alcohol" policy • Baggage search • Focus on health and safety • Employee assistance • Addiction counselling	• Negative - transportation of substances through the site, combined with increased ability to afford substances will have effects on substance abuse • Positive – focus on health and safety, employee assistance and counselling will increase awareness of employees	Not significant
	Well-being of children	• Changes in parenting • Increased household income and food security	• Orientation and training related to fly-in/fly-out adaptation • Fund to support family services • Money management training • Orientation and training related to health and well-being	• Improved well-being of children	Significant - positive
	Community and social stability	• Absence from community during work rotation	• Orientation and training related to fly-in/fly-out adaptation • Short rotation (two week in / two week out)	• Absence of residents while they are working at Project will have effect on community social stability	Not significant

HUMAN ENVIRONMENT					
Valued Socio-Economic Component	**Key Indicator(s)**	**Potential Effect(s)**	**Mitigation Measures**	**Residual Effect(s)**	**Significance Rating**
Community infrastructure and public service	Competition for skilled workers	• Competition for skilled workers • Labour force capacity	• Early start for skills training • On-going training • Employment experience	• Competition for skilled workers may lead to temporary effects on municipal services.	Not significant
Cultural resources	Cultural resources	• Disturbance or removal of archaeological sites • Unauthorized removal of artefacts	• Pre-development archaeological surveys, mitigation by SDR prior to construction, implementation of a chance finds procedure • Training, flagging and exclusion zones, management plans, implementation of chance finds procedure	• Unmitigated archaeological sites subject to accidental or deliberate partial or complete destruction • Increased access to interior could result in chance finds • Increased traffic at Steensby Inlet could affect archaeological resources	Not significant
Resources and land use	Inuit harvesting of wildlife	• Changes in caribou harvesting • Changes in marine mammal harvesting • Changes in fish harvesting	• Prohibition of harvesting by employees	• Changes in caribou harvesting • Changes in marine mammal harvesting • Changes in fish harvesting	Not significant

HUMAN ENVIRONMENT					
Valued Socio-Economic Component	**Key Indicator(s)**	**Potential Effect(s)**	**Mitigation Measures**	**Residual Effect(s)**	**Significance Rating**
Resources and land use	Travel and camps	• Safe travel around Eclipse Sound and Pond Inlet • Safe travel through Milne Port • Emissions and noise disruption • Sensory disturbance and safety along Milne Inlet Tote Road • Detour around Mine Site • HTO cabin closure • Difficulty and safety relating to railway crossings • Detour around Steensby Port • Restrictions on camping locations around Steensby Port	• Road Management Plan • Mine Closure Plan • Safety Plan • IIBA Agreement with QIA • Designated railway crossing locations	• Safe travel around Eclipse Sound and Pond Inlet • Safe travel through Milne Port • Emissions and noise disruption • Sensory disturbance and safety along Milne Inlet Tote Road • Detour around Mine Site • HTO cabin closure • Difficulty and safety relating to railway crossings • Detour around Steensby Port • Restrictions on camping locations around Steensby Port	Not significant

HUMAN ENVIRONMENT					
Valued Socio-Economic Component	**Key Indicator(s)**	**Potential Effect(s)**	**Mitigation Measures**	**Residual Effect(s)**	**Significance Rating**
Governance and leadership	Governance and leadership	• IIBA Agreement with QIA • Development of leadership skills	• Participation in initiatives to identify indicators of relevance to regional monitoring programs, share data generated by activities related to the Project, and discuss the interpretation of this data with others involved in these initiatives • Fit well with the strategic priorities identified for both the RSA	• IIBA agreement with QIA • Development of leadership skills	Significant - positive
Livelihood and Employment	Job creation	• Creation of jobs in the LSA	• LSA points of hire	• Creation of jobs in the LSA	Significant - positive
	Local employment	• Employment of LSA residents	• Recruitment strategy • Inuit hiring policy • Management commitment	• Employment of LSA residents	Significant - positive
	Career path	• Job progression and career advancement – new career paths		• Job progression and career advancement – new career paths	Significant - positive
Economic Development and Self-reliance	Land	• Increased land use	• Lease agreement	• Increased land use	Not significant
	People	• Increased local recruitment • Increased education and awareness • Development of community support funds	• Inuit recruitment strategy • Education and training program • Community support fund	• Increased local recruitment • Increased education and awareness • Development of community support funds	Significant - positive

HUMAN ENVIRONMENT					
Valued Socio-Economic Component	**Key Indicator(s)**	**Potential Effect(s)**	**Mitigation Measures**	**Residual Effect(s)**	**Significance Rating**
Economic development and self-reliance	Economy	• Improved community economy	• Inuit contracting strategy • Capacity building fund • Cooperation with QIA to develop and support local entrepreneurs/businesses	• Improved community economy	Significant - positive
		• Improved territorial economy	• Direct and indirect job creation • Taxes and royalties	• Improved territorial economy	Significant - positive
Contracting and business opportunities	Marketplace	• Expanded market - business services to Project • Expanded market - consumer goods and services	• Inuit contracting strategy • Cooperation with QIA to build Inuit capacity • Establish a fund to support and build capacity	• Expanded market — business services to Project • Expanded market — consumer goods and services	Uncertain - positive
	Entrepreneurial capacity	• Increased entrepreneurial capacity	• Management assistance to Inuit designated firms • Opportunities for local entrepreneurs to work with Project	• Increased entrepreneurial capacity • Increased entrepreneurial capacity	Uncertain - positive
Benefits, taxes and royalties	Territorial own-source revenues	• Increased taxes and revenues • Payments of payroll and corporate taxes to territorial government	• None	• Increased taxes and revenues • Payments of payroll and corporate taxes to territorial government	Significant - positive

Over the long term, the road, railway, and port infrastructure built by the Project will provide opportunities to access further mineral deposits in the North Baffin region and could improve access for Inuit harvesting and tourism. The two ports will provide opportunities for additional commercial uses and the bathymetry information collected by the Project will provide important information for shipping lanes through Foxe Basin. In addition, Project activity will help confirm Canadian sovereignty over the region.

SECTION 15.0 - FORMAT OF THE ENVIRONMENTAL IMPACT STATEMENT

The EIS is part of the environmental assessment process established for a project under the Nunavut Land Claims Agreement. Under this environmental assessment process, the proponent of a project, such as the Mary River Project, describes the surrounding environment and the proposed development. Effects are then predicted and mitigation plans are developed. The severity or "significance" of residual effects (effects remaining after mitigation measures have been applied), are also evaluated based on established criteria and expert opinion, considering the level of significance attributed by others.

A number of regulatory processes apply to this Project, including conformity to the North Baffin Regional Land Use Plan, an environmental review by NIRB and an environmental review by the Canadian Transportation Act. NIRB will coordinate these reviews, as well as a public review necessary to potentially amend the land use plan to accommodate Project needs.

The EIS complies with the requirements of NIRB as outlined in the Guidelines for the Preparation of the EIS issued on November 16, 2009 and subsequently amended on November 3, 2010. The EIS consists of 10 volumes, as follows:

Volume 1: EIS Main Document - provides an overview of the EIS, including a summary of the proposed Project, background and need for the Project, baseline studies, effect assessment methods and results, as well as the management and mitigation plans to meet commitments in this EIS.

Volume 2: Consultation, Regulatory Context, and Assessment Methodology - presents results of extensive consultation, describes regulatory requirements, and presents methods used to undertake assessments of potential effects on the biophysical and socio-economic environments.

Volume 3: Project Description - describes the proposed Project, including estimated schedule, facilities and infrastructure included in the Project, construction, operation, and closure and post/closure activities, estimated workforce, and alternatives considered to the Project and within the Project.

Volume 4: Human Environment - presents results of socio-economic background studies and potential effects of the Project on nearby communities and the people of these communities.

Volume 5: Atmospheric Environment - includes results of background atmospheric studies, an assessment of the Project's GHG emissions relative to Nunavut, Canada and the world, and potential effects of the Project on air quality and noise levels in the region.

Volume 6: Terrestrial Environment - describes results of background studies and potential effects of the Project on the terrestrial environment, including sensitive landforms, vegetation, birds, and caribou.

Volume 7: Freshwater Environment - presents results of background studies and potential effects of the Project on the freshwater aquatic environment, including flow and quality of water, and effects on fish and fish habitat.

Volume 8: Marine Environment - addresses results of background studies and potential effects of the Project on the marine environment, including sea ice, water and sediment quality, fish and marine mammals.

Volume 9: Cumulative Effects and Other Assessments – assesses cumulative effects of the Project considering past, present, and reasonably foreseeable projects and activities in the region that might also cause effects on valued components assessed in the EIS. Other assessments included an evaluation of

potential accidental events, their potential effects, and likelihood of occurrence of these events, effects of the environment on the Project (i.e., extreme weather, climate change), and effects that extend beyond the boundaries of the Nunavut Settlement Area (transboundary effects).

Volume 10: EHS Management System - presents Baffinland's comprehensive management system and related management plans that will be established to limit and mitigate any potentially negative effects and enhance benefits of the Project on its employees, contractors, residents of Nunavut, and the natural environment.