

## **APPENDIX 1E**

### **PLAIN LANGUAGE SUMMARIES**







## 1.0 ՆԻՐՈՒՆԴՈՒՄ

[illegible]



## 2.0 ᐅᓂᖃᕐᑦᑐᓄᓚᓂᓴᒪ ᖃᓄᐃᖃᓯᓄᓴ

## 2.1 ▷ Q ρσ<sup>b</sup> ▷<sup>q</sup>b▷<sup>r</sup>q<sup>b</sup>q<sup>b</sup><

[illegible]

## 2.2 ԲԻՇ ԳԵՃԱԿ ԳԵՇԱՇԱՃ ԳԵՇՈՒՄ

- [illegible]

[illegible][illegible]

- [illegible]



- [illegible]

[illegible]

- [illegible]



- ## 2.5 Δῖ᾽ἄλλῃ

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### 3.0 $\Delta C^{\text{ss}}_{\text{HbA1c}} \ll \Delta C^{\text{ss}}_{\text{HbA1c}}$

### 3.1 ርዕ በበኛዎቻችን ያረፉ ለኋለኞቻችን

[illegible]

### 3.2 የፌዴራል ፍርድቤት

[illegible]

### 3.3 $\Delta^b \subset \Delta \sigma_n \sigma \Delta^b j^b \subset \mathcal{A}^b$

$\triangleright_{\mathcal{Q}}$  በበኛኞቻችን ልጅ ሆኖ ሊሰማልና ለእርሱ፡

- [illegible]

$\triangleleft^b \rangle (\triangleright \sigma \triangleright \sigma \triangleleft^b) \circ_b$    
 $\cap \cap \circ^b (\triangleright \nearrow L \nwarrow^b \Delta L^a \circ \Delta \searrow^b \circ_b$

- [illegible]

### 3.4 ንግድና ሥራ ለማድረግ የሚያስፈልጉ ምንጮች

- [illegible]



- [illegible]

### 3.5 $\Delta L^a \Delta C^b L^c C^d$

[illegible]







- መደጋገሚያ ሥልጣን ሲሰጥ ለጋራ ጥቅም ሲሆን ለግል ጥቅም አይደለም፡፡ ለዚህም ምሳሌ ለጋራ ጥቅም ሲሆን ለግል ጥቅም አይደለም፡፡
- ለጋራ ጥቅም ሲሆን ለግል ጥቅም አይደለም፡፡ ለዚህም ምሳሌ ለጋራ ጥቅም ሲሆን ለግል ጥቅም አይደለም፡፡

[illegible]

- [illegible]

#### 4.5 Δῖ᾽ἰᾱᾷᾳ

[illegible]



## 5.0 ငှက်ပျံဖုတ်ဌာန ပံ့ပိုးမှုဖုတ်ဌာန

## 5.1 ▷<sub>L</sub> ρ<sub>r</sub><sup>b</sup> ▷<sup>a</sup><sub>b</sub>▷<sup>c</sup><sub>r</sub>▷<sup>d</sup><sub>L</sub>

[illegible]

## 5.2 የፊትና የኋላ ምዕራፍ

ΛΓΗΔ<sup>α</sup>ΥΖΔ<sup>β</sup>Ζ<sup>γ</sup> ΕΔ<sup>δ</sup>ΓΗΔ<sup>ε</sup>ΥΖ<sup>ς</sup>Ζ<sup>ζ</sup> Δ<sup>η</sup>ΕΖΔ<sup>θ</sup>Ζ<sup>ι</sup>Ζ<sup>κ</sup> Δ<sup>λ</sup>ΕΖ<sup>μ</sup>Ζ<sup>ν</sup> Δ<sup>ξ</sup>ΕΖ<sup>ο</sup>Ζ<sup>π</sup> Δ<sup>ρ</sup>ΕΖ<sup>σ</sup>Ζ<sup>τ</sup>.

- [illegible]

[illegible]

### 5.3 $\triangleleft^b \supset^b \rho \sigma \triangleright \sigma \triangleleft \rho \triangleright \rho \triangleright \rho$

[illegible]

- [illegible]



[illegible]

- [illegible]



- [illegible]

## 5.5 Δῖα ἔλκν

[illegible]







[illegible]

- [illegible]

#### 6.4 ၵမ္မာဒါဒိဗ္ဗဇာတိဗ္ဗာဏဗျူဟာ အကုသိကဗျူဟာ

- [illegible]



[illegible]



## 7.0 ልዩ ልዩ ስልጣን ስለሚሰጥ ስልጣን

### 7.1\_ငမူ ဂဏန်းပုံနှစ်ခု ပုံနှစ်ခု အမှတ်အသားပေးခြင်း

[illegible][illegible]

- [illegible]

### 7.3 $\Delta_{\mathcal{C}}^{\mathcal{C}}$ ን $\Delta_{\mathcal{C}}^{\mathcal{C}}$ ለውጥ

- [illegible]

### 7.3.1 $\mathcal{D}^b\mathcal{D}^c$

- [illegible]

[illegible]

- መሀታፊ ርዕሰ ቤት በበኩላቸው ዲጂታይዝን 8 (መመሪያዎች 8-4.3, 8-4.4, 8-5.5, 8-5.6, 8-5.7, 8-5.8, 8-5.9,) የተለየ የሆነ አገልግሎት ማስጠበቅ ከሚችሉበት ሁሉም አገልግሎቶች ውስጥ አንዱን መመርመር



[illegible]

## 7.4 ΔLΔC<sup>α</sup>β

[illegible]



## 8.0 Cᐅᐅᑦ, ᐅᐅᐅᑦ ᐱᐅᑦᐅᑦᐅᑦ

## 8.1 ▷ ᐃ ᑭᓪᓴᐅᑦᓴᑦᓴᑦ

[illegible]

## 8.2 ԲԻՇ ԳԵՃԱԿԵՇԸՆԴԵՆ

ΛΓΔ<sup>a</sup>ΒΔ<sup>b</sup>Δ<sup>b</sup> ΔΔΔ<sup>b</sup>ΓΔ<sup>b</sup> ΔΔσ.

- [illegible]

[illegible]

### 8.3 ၎်းၵ်းၵ်းၵ်းၵ်းၵ်းၵ်း

[illegible]

- [illegible]



- [illegible]

#### 8.4 ၵမ္မာဒၢသံသရာဇာတိဗျာဓိဗျာဓိ ဟောတၢ်သံသရာဇာတိဗျာဓိ

- [illegible]

## 8.5 Δ<sub>ΓC</sub>↗ΔC▷Δ<sub>ΓC</sub>

- የልዩነት ካላገኘው ፊርማ ተቀባይነት አለመስጠት ምክንያት ሆኖ በፍርድ ቤቱ ውስጥ ማስተካከል አልተቻለም ብሎ ሲናገር ለፍርድ ቤቱ ማስተካከል አልተቻለም ብሎ ሲናገር ለፍርድ ቤቱ ማስተካከል አልተቻለም ብሎ ሲናገር



ᐅᓄᓐᓂ ᐱᓐᓂᓐᓂᓐᓂ ᐱᓐᓂᓐᓂᓐᓂ. ᐱᓐᓂᓐᓂ ᐱᓐᓂᓐᓂᓐᓂ ᐱᓐᓂᓐᓂ ᐱᓐᓂᓐᓂ

- ᐱᓐᓂᓐᓂ ᐱᓐᓂᓐᓂᓐᓂ ᐱᓐᓂᓐᓂ ᐱᓐᓂᓐᓂ ᐱᓐᓂᓐᓂ ᐱᓐᓂᓐᓂ  
ᐱᓐᓂᓐᓂ ᐱᓐᓂᓐᓂᓐᓂ (ᐱᓐᓂ, ᐱᓐᓂᓐᓂᓐᓂᓐᓂ ᐱᓐᓂᓐᓂᓐᓂ ᐱᓐᓂᓐᓂ)  
ᐱᓐᓂᓐᓂᓐᓂᓐᓂ ᐱᓐᓂᓐᓂᓐᓂᓐᓂ ᐱᓐᓂᓐᓂᓐᓂ. ᐱᓐᓂᓐᓂᓐᓂᓐᓂ, ᐱᓐᓂ ᐱᓐᓂᓐᓂᓐᓂ  
ᐱᓐᓂᓐᓂᓐᓂᓐᓂᓐᓂ ᐱᓐᓂᓐᓂᓐᓂᓐᓂ ᐱᓐᓂᓐᓂᓐᓂ ᐱᓐᓂᓐᓂ. ᐱᓐᓂᓐᓂᓐᓂ  
ᐱᓐᓂᓐᓂᓐᓂᓐᓂᓐᓂ ᐱᓐᓂᓐᓂᓐᓂᓐᓂ.







- ወደሮሜ ምክር ቤቱ የገባው የግብርና ሚኒስትር ለግብርና ሚኒስትር ሆኖ ስራውን አጠናቋል።
- ወደሮሜ ምክር ቤቱ የገባው ለግብርና ሚኒስትር ሆኖ ስራውን አጠናቋል።
- ወደሮሜ ምክር ቤቱ የገባው ለግብርና ሚኒስትር ሆኖ ስራውን አጠናቋል።
- ወደሮሜ ምክር ቤቱ የገባው ለግብርና ሚኒስትር ሆኖ ስራውን አጠናቋል።

### 9.3 $\Delta^b \mathcal{C}^b \mathcal{P}^b \mathcal{C}^b \Delta^b \mathcal{C}^b \mathcal{P}^b \mathcal{C}^b \Delta^b$

[illegible]

### 9.3.1 ৯৩৮

- [illegible]

### 9.3.2 $\triangleright^b \triangleleft^c$

- [illegible]



- ድህረ ምረቃ ስርዓቱን በጥሩ ሁኔታ ለማግኘት ማድረግ፡
- ድህረ ምረቃ ስርዓቱን በጥሩ ሁኔታ ለማግኘት ማድረግ፡
- ስርዓቱን በጥሩ ሁኔታ ለማግኘት ማድረግ፡

### 9.3.3 ΔΔΛ<sup>c</sup>

- [illegible]

### 9.3.4 'ᠪᠳᠤᠵᠪᠴᠠᠳᠤ 'ᠫᠤᠵᠤᠰᠤ

- [illegible]

### 9.3.5 ‘ပုဏ္ဏား’ ချစ်ခင်မှု

- [illegible]







[illegible][illegible]



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## 10.0 ႁႃႈႁူဝ် ၵႃႈႁူဝ် ၵႃႈႁူဝ်

## 10.1 ▷ ᲑᲗᲚᲔ ᲑᲕᲑᲗᲕᲔᲗᲗᲔ

[illegible]

## 10.2 ԲԴԸ ԳԵՃԱԿԻՆԸ ԵՎ ԵԼԵԿՏՐՈՆԻԿԸ

ΛΓΗΔ<sup>α</sup>ΥΖΔ<sup>β</sup>Ζ<sup>γ</sup> ΩΔΩ<sup>δ</sup>ΥΖΩ<sup>ε</sup> ΔΕΘ.

- [illegible]



### 10.3 $\triangleleft^b \supset^b \rho \sigma \triangleright \sigma \triangleleft \rho \triangleright \rho \triangleright \rho$

[illegible]

- [illegible]



[illegible]

- [illegible]

[illegible]

- [illegible]



- [illegible]

## 10.5 Δ<sub>r</sub>C<sup>o</sup>Δ<sub>r</sub>C<sup>o</sup>Δ<sub>r</sub>C<sup>o</sup>

- [illegible]



## 11.0 $\Gamma^c \Delta^c \subseteq C^c$ $\Gamma^c \Delta^c \dot{\subseteq} C^c$

### 11.1 Եւ Քիմիայի Եւ ԲՈՒՄԱՆԱԳԻՏՈՒԹՅԱՆ

[illegible]

## 11.2 ԲԴԸ ԳԵՃԱԿԸ ԵՎ ԸՆԴՀԱՆՈՒՄԸ

[illegible]

- [illegible]

[illegible]

### 11.3 $\triangleleft^b \supset^b C \triangleright \sigma \triangleright \sigma \triangleleft \neg \neg \triangleright \neg$

[illegible]

- [illegible]



[illegible][illegible][illegible]



## 12.0 $\sigma$ - $\rho$ 混合結合

## 12.1 ▷\_ ρΓ^b ▷^c\_b▷^c\_b^c<

መረጃዎቹን ይገኝታል። ስለሆነም የፍትሕና የሥነ ምግባር ለጥናትና ለጥናት የሚያስፈልጉትን ምርመራዎች ማድረግ ይቻላል።

## 12.2 ኖቦር ኖቴላኖርፈኖርኖር

ΛΓΗΔ<sup>α</sup>ΖΕ<sup>β</sup>Θ<sup>γ</sup> ρΔσ<sup>δ</sup>ϕΛ<sup>ε</sup>Θ<sup>ζ</sup> Δ<sup>η</sup>σ.

- [illegible]

### 12.3 $\Delta^b \mathcal{C}^b / \sigma \triangleright \mathcal{L}^a \mathcal{L}^b \mathcal{C}^b$

[illegible]

- ሳይሆን ሌላው ልዩ ምክር ቤት ለጥያቄው ይታወቃል፡፡ ለጥያቄው ይታወቃል፡፡ ለጥያቄው ይታወቃል፡፡
- ለጥያቄው ይታወቃል፡፡ ለጥያቄው ይታወቃል፡፡ ለጥያቄው ይታወቃል፡፡
- ለጥያቄው ይታወቃል፡፡ ለጥያቄው ይታወቃል፡፡ ለጥያቄው ይታወቃል፡፡
- ለጥያቄው ይታወቃል፡፡ ለጥያቄው ይታወቃል፡፡ ለጥያቄው ይታወቃል፡፡



- [illegible]



[illegible]

- [illegible]

## 12.5 ልዩነት

[illegible]



## 13.0 CnD<sup>9</sup>T Pd

### 13.1 ▷ $\rho/\sigma^b$ ▷ $\epsilon_b \triangleright \rho/\sigma^b \epsilon_L^{\text{qj}}$

[illegible]

### 13.2 የገጽ ፍጥነትና የገጽ ርዕደር

$\dot{C}^b d \triangleleft \wedge c n \triangleleft^a j c \triangleright^{fb} j^c \triangleright d e \sigma$  በበኛኞቹ ሆረጅ.

- [illegible]

[illegible][illegible][illegible]

- [illegible]



- [illegible]

### 13.4 ԳԵՍՏԱՎՈՐԱԿԱՆ ԵՎ ԼՈՐԴՆԵՐԻ ՄԱՍԻՆ ԼՈՐԴԱՎՈՐՈՒՄԻՆ ԵՎ ԼՈՐԴԱՎՈՐՈՒՄԻՆ ԵՎ ԼՈՐԴԱՎՈՐՈՒՄԻՆ ԵՎ ԼՈՐԴԱՎՈՐՈՒՄԻՆ

- [illegible]

### 13.5 ልዩነት

[illegible]



## 14.0 မူဝါဒ, အင်္ဂါ အကျဉ်းချုပ်

## 14.1 ▷\_ ρσ^b ▷^c▷ρ^c^b<

ወደፊት፣ ልዥኛ የፋሽያዊ ሚኒስትር ይኖርታል። ይህም ለሀገራችን የሚጠበቅ ምንም ዓይነት ጉዳት አያሳድርም። ለዚህም ምሳሌ ለሀገራችን የሚጠበቅ ምንም ዓይነት ጉዳት አያሳድርም።

## 14.2 ԲԴԸ ԳԵՃԱԿԵՐԱՆՈՒՄԸ

$$\Lambda \Gamma \Delta \nabla \epsilon \zeta \eta \theta \iota \kappa \lambda \mu \nu \xi \omicron \pi \rho \sigma \tau \upsilon \phi \chi \psi \omega$$

- [illegible]

### 14.3 $\Delta^b \mathcal{C}^b / \sigma \Delta \sigma \Delta \mathcal{C} / \Gamma \Delta \mathcal{C}$

[illegible]

- [illegible]



[illegible][illegible]



**15.0** ጋራ ርዕስ፡ ልማትና የኢንቨስትመንት ድጋፍ ለውጤት ማጠናከሪያ

15.1  $\dot{C}_u$   $\rho \gamma \sigma^b$   $\triangleright^{\gamma_b} \triangleright^{\gamma_b} \gamma_b <$

ደጋፊዎችን ለማግኘት ለሚችሉ ሁሉም ሰዎች ምስጋናዎቻችንን ይቀርባል። ለሁሉም ሰዎች ምስጋናዎቻችንን ይቀርባል።

## 15.2 ᐱᓕᓐ ᓂᓄᓐᓂᓐ ᓂᓄᓐᓂᓐ ᓂᓄᓐᓂᓐ

[illegible]

### 15.3 $\triangleleft \triangleright \triangleright d^c \triangleright r^c b^c c^c \sigma^c \triangleright \Gamma \triangleleft^c \triangleleft d^c$

[illegible]

## 15.4 丕<sup>b</sup>𐌸<sup>c</sup>𐌲<sup>d</sup>𐌹<sup>e</sup> 𐌲𐌸𐌹𐌳<sup>f</sup>𐌸<sup>g</sup>𐌹<sup>h</sup>

[illegible][illegible][illegible][illegible][illegible]



[illegible]

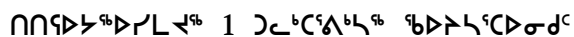
- [illegible]

[illegible]

- ረዕሰ ሙዚየምና ልዩ ርዕሰ ምክር ቤቱም 325 የሪፐብሊክ ልረጃ ካርዶችን ለሕዝቡ ለማስተካከል የሚችሉ ለውጦችን ያሳያል፡፡
- ካርዶችን ለማግኘት ለሚችሉ (2) ልዩ የሕግ አዋጅ ምክር ቤቶች ለሕዝቡ ለማስተካከል የሚችሉ ለውጦችን ያሳያል፡፡
- ለሕግ አዋጅ ምክር ቤቱ ለሕዝቡ ለማስተካከል የሚችሉ ለውጦችን ያሳያል፡፡ (7 መስመራት ለሕግ አዋጅ ምክር ቤቱ ለሕዝቡ ለማስተካከል የሚችሉ ለውጦችን ያሳያል፡፡ (3) ሙዚየምና ልዩ ርዕሰ ምክር ቤቱም ለሕዝቡ ለማስተካከል የሚችሉ ለውጦችን ያሳያል፡፡

[illegible]



[illegible]



[illegible]

## 16.1 C<sub>∞</sub> ƒ ለጽፍ ማጽናጽ

[illegible]

## 16.2 $\triangleright^C \triangleright^f \triangleright^g \sigma^{\text{fb}}$ $\triangleleft \text{L} \text{ } \triangleleft \text{b} \triangleleft^f \triangleleft^g \sigma^{\text{fb}}$

- [illegible]

### 16.3 Δελφινός

[illegible]



[illegible]







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## 18.0 မူပိုင်ခွင့်၊ စာပေပိုင်ခွင့်၊ အခွင့်အရေး

### 18.1 ▷<sub>a</sub> ρ<sub>r</sub>σ<sup>b</sup> ▷<sup>c</sup>b▷<sup>d</sup>b<sup>e</sup>L<sup>f</sup>j<sup>c</sup>

[illegible]

## 18.2 ԲԻՆԱՐԱՐ ԿՈԴԻՐԱՆԻՔ

CL<sup>a</sup>q ΛΓηΔ<sup>a</sup>Υq▷<sup>ςb</sup>▷<sup>ςb</sup> qΔđ<sup>ςb</sup>ΓL▷<sup>ςb</sup>▷<sup>ςc</sup>σ.

- [illegible]

### 18.3 $\Delta^b \supset^b C \triangleright \sigma \triangleright \sigma \triangleleft \neg \neg \neg \triangleright \neg \neg$

[illegible]

- [illegible]



[illegible]

- ነፍሳትና ሕይወቶችን የሚያስተካው የአየር ዓለም አቀፍ ጥበቃ ማረጋገጥና ምርመራ ማድረግ ይገባል።
- ለጤናማ እና ለሰላማዊ መኖሪያ ቦታ ማዘጋጀት ይገባል።

#### 18.4 ንጹህ ስርዓተ ስራ ለጥራት ማረጋገጫ

- [illegible]

## 18.5 ልሳናት፣ጥጥር

[illegible]

၎င်းတို့သည် အောက်ဖော်ပြပါအတိုင်း ဖြစ်ပေါ်ခဲ့သည်။

[illegible]



## 19.0 ᐱᕈᖃᕕ

19.1  $\triangleright_{\mathcal{A}} \rho \sigma^b \triangleright^{\mathfrak{b}} \triangleright^{\mathfrak{b}} \rho^{\mathfrak{b}} \sigma^{\mathfrak{b}} \triangleleft$

[illegible][illegible]

## 19.2 ԲԴԸ ԳԵՃԱԿԸ ԵՎ ԸՆԴՀԱՆՈՒՄ

$\Lambda\sigma\kappa\triangleleft^a\jmath\subset\triangleright^b\supset^c\triangleright\leq\sigma\text{ } \mathfrak{u}\Delta\dot{\mathfrak{u}}^b\jmath\mathcal{L}\mathfrak{L}^c.$

- [illegible]

[illegible]

### 19.3 $\Delta^b \supset^b C \triangleright \sigma \triangleleft \sigma \triangleleft \varsigma \nearrow \Gamma \searrow \triangleright \searrow^c$

ርዕረ ልዩበድ ልጋኔርድላኛሚረ በበኔኔሥረ ልሥረኔኔኔሥረ ለሥረላኛሥረ  
ልጋኔኔሥረላኛሥረሥረ ለሥረኔሥረሥረ ላኛሥረሥረሥረ ኔሥረሥረሥረሥረ.

- [illegible]



- [illegible]

[illegible]

- [illegible]

## 19.5 Δῖ᾽ἄλλοις

- [illegible]



20.0 Δ<sup>•</sup>ϕ<sup>c</sup>⌋<sup>c</sup> ◀<sup>b</sup>⌋<sup>ϕ<sub>b</sub></sup>◀<sup>σ<sup>ϕ<sub>b</sub></sup></sup>

## 20.1 Δαμνικ αλυσ βελγνισμνικ

$L^a$     $nn^b$     $\wedge \neg n^b$

- [illegible]

[illegible]

20.2  $\Delta \sigma \ll \sigma^{\text{fb}}$   $\Delta L \gg \Delta^{\text{fb}} \Delta t \gg \Delta^{\text{fb}} \sigma^{\text{fb}}$

L<sup>a</sup><sub>e</sub> በበኛ ልዩነት፡

- [illegible]

$$\triangleleft^b \rangle^b \triangleright \sigma^c \lrcorner^c \triangleright \sigma^b \dot{b}^b \triangleright^b \rangle^b \lrcorner^b \triangleright^b.$$

- [illegible]



- [illegible]

[illegible]

### 20.3 $\Delta_{\text{eff}}^{\text{fb}}$ $\ll$ $\Delta_{\text{fb}}^{\text{fb}}$ $\Delta_{\text{fb}}^{\text{fb}}$ $\Delta_{\text{fb}}^{\text{fb}}$

L<sup>a</sup><sub>e</sub> ဂဂဏ် အနုပညာ:

[illegible]

- [illegible]

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[www.baffinland.com](http://www.baffinland.com)



- [illegible]

$\Delta^{\mathfrak{b}} \mathfrak{a} \Delta^{\mathfrak{c}} \quad \Delta^{\mathfrak{c}} \Gamma^{\mathfrak{a}} \Gamma^{\mathfrak{c}} \quad (\mathcal{L} \mathfrak{d} \mathfrak{a}^{\mathfrak{c}} \sigma \quad \parallel \Delta^{\mathfrak{c}} \Gamma^{\mathfrak{a}} \Gamma^{\mathfrak{c}})_{\mathfrak{c}}^{\mathfrak{c}} \parallel \quad \Delta \triangleright \mathcal{C} \mathcal{N} \mathfrak{a}^{\mathfrak{c}} \sigma \quad \triangleright \mathfrak{z} \mathfrak{c} \mathfrak{b} \triangleright \mathfrak{d}^{\mathfrak{a}} \mathfrak{c} \mathfrak{b}$

[illegible]



ፊርማ	የፌዴራል ፖሊስ ፊርማ	የፌዴራል ፖሊስ ፊርማ	የፌዴራል ፖሊስ ፊርማ	የፌዴራል ፖሊስ ፊርማ	የፌዴራል ፖሊስ ፊርማ
			(የፌዴራል ፖሊስ ፊርማ)		
	የፌዴራል ፖሊስ ፊርማ	የፌዴራል ፖሊስ ፊርማ	20%	40%	40%
	የፌዴራል ፖሊስ ፊርማ	የፌዴራል ፖሊስ ፊርማ	70%	20%	10%
	የፌዴራል ፖሊስ ፊርማ	የፌዴራል ፖሊስ ፊርማ	40%	40%	20%
	የፌዴራል ፖሊስ ፊርማ	የፌዴራል ፖሊስ ፊርማ	30%	30%	40%
የፌዴራል ፖሊስ ፊርማ	የፌዴራል ፖሊስ ፊርማ	የፌዴራል ፖሊስ ፊርማ	40%	40%	20%
	የፌዴራል ፖሊስ ፊርማ	የፌዴራል ፖሊስ ፊርማ	20%	20%	60%
	የፌዴራል ፖሊስ ፊርማ	የፌዴራል ፖሊስ ፊርማ	20%	30%	50%
	የፌዴራል ፖሊስ ፊርማ	የፌዴራል ፖሊስ ፊርማ	40%	40%	20%
	የፌዴራል ፖሊስ ፊርማ	የፌዴራል ፖሊስ ፊርማ	20%	30%	50%



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[illegible]

- [illegible]



[illegible][illegible]

20.4  $\Delta_{\text{ad}} \Delta^{\text{c}} \nabla^{\text{a}} \sigma \nabla^{\text{b}} \text{C} \Delta_{\text{c}} \sigma^{\text{a}} \text{r}^{\text{c}} \nabla \text{L} \Delta_{\text{ad}} \nabla^{\text{a}} \sigma^{\text{a}} \text{r}^{\text{c}}$

ငံ့ ဂဏ်း အနိမ့်နိမ့်.

- [illegible]



[illegible]

- [illegible]

[illegible]

**20.5**  $p_{\alpha} \triangleright p^c \wedge q \vdash p^{\omega} \sigma^{\omega} \triangleleft L \rightarrow \Delta \dot{C} d p_{\alpha} \tau^{\omega} \sigma^{\omega}$

- [illegible]

$$\triangleleft^b \rangle^{qb} (\triangleright \sigma^q \lrcorner^c \triangleright \sigma^b \dot{b}^{qb} \triangleright^{qb} \text{b}^q \text{L} \triangleright^{qb}.$$

- [illegible]



[illegible]

## 20.6 မေ့လျော့မှု အလွန်မြန်သော အခြေအနေအထားများ

C<sup>a</sup><sub>2</sub> H<sup>b</sup> N<sup>c</sup> O<sup>d</sup>.

- ᐃᔭᐱᔭᐱᔭᐱᔭᐱᔭ ᐱᔭᐱᔭᐱᔭᐱᔭᐱᔭ ᐱᔭᐱᔭᐱᔭᐱᔭᐱᔭ.

$$\triangleleft^b \rangle^b (\triangleright \sigma^c \lrcorner^c \triangleright \sigma^b \dot{b}^b \triangleright^b \rangle^b \lrcorner^b \triangleright^b \rangle^b :$$

- [illegible]

[illegible]

20.7  $b^{\circ} \subset C^{\circ} \sigma \triangleleft \sigma^{\circ} \triangleleft L \subset \Lambda \sigma \sigma^{\circ} \sigma^{\circ} \subset \Lambda \triangleleft \sigma^{\circ} \sigma \triangleleft C^{\circ} \sigma^{\circ}$

ငံ့ ဂဏ်း အဏ်း၌

- $\Lambda_{\text{QCD}} \propto (\alpha_s)^{-1} \Rightarrow \alpha_s \rightarrow 0$  as  $\mu \rightarrow \infty$ ,  $\Delta b \propto \alpha_s^2 \ln(\mu)$

$$\triangleleft^b \rangle^{\zeta_b} (\triangleright \sigma^{\zeta} \perp^c \triangleright \sigma^b \overset{\cdot}{b}^{\zeta_b} \triangleright^{\zeta_b} \zeta_b \nearrow \searrow \triangleright^{\zeta_b}.$$

- [illegible]



- ወደ ሥልጣን የሚደርሱት ሰባዊ መብት አጠቃቀም ለሀገራችን ምን ዓይነት ለውጥ ያመጣል? ለሀገራችን ምን ዓይነት ምክንያት ይሆናል? ለሀገራችን ምን ዓይነት ምክንያት ይሆናል?
- ወደ ሥልጣን የሚደርሱት ሰባዊ መብት አጠቃቀም ለሀገራችን ምን ዓይነት ለውጥ ያመጣል? ለሀገራችን ምን ዓይነት ምክንያት ይሆናል? ለሀገራችን ምን ዓይነት ምክንያት ይሆናል?
- ለሀገራችን ምን ዓይነት ምክንያት ይሆናል? ለሀገራችን ምን ዓይነት ምክንያት ይሆናል? ለሀገራችን ምን ዓይነት ምክንያት ይሆናል?

[illegible]

20.8  $P^b L C^c \triangleleft L \subseteq M^L \Gamma^b \triangleleft D^c \sigma^c$

L<sup>a</sup> 0 005<sup>b</sup> 0.50<sup>b</sup>:

- [illegible]

[illegible]

- [illegible]



- [illegible]

[illegible]

### 20.8.1 $\Delta^a \Gamma \nabla^a \sigma^b$

L<sup>a</sup><sub>2</sub> 009<sup>b</sup> 2<sup>b</sup>2<sup>b</sup>:

- [illegible]

[illegible]

- [illegible]



- [illegible]

[illegible]

## 20.9 Δ<sup>c</sup>d<sup>c</sup> Δ<sup>b</sup>b<sup>c</sup>σ<sup>b</sup>

**L<sup>o</sup> ခဏ်နိမ္မိတ် အသံအလုံးများ:**

- [illegible]



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$\langle \mathbb{C}^a \mathbb{C}^b \sigma^c \rangle \propto \langle \mathbb{C}^a \mathbb{C}^b \rangle \langle \sigma^c \rangle$  and  $\langle \mathbb{C}^a \mathbb{C}^b \sigma^c \rangle \propto \langle \mathbb{C}^a \mathbb{C}^b \rangle \langle \sigma^c \rangle$

የመጋቢት ፳፻፲፱ ዓ.ም. ጥቅምት ፳፻፲፱ ዓ.ም.	ጥቅምት ፳፻፲፱ ዓ.ም. ጥቅምት ፳፻፲፱ ዓ.ም.	ጥቅምት ፳፻፲፱ ዓ.ም. ጥቅምት ፳፻፲፱ ዓ.ም.	ጥቅምት ፳፻፲፱ ዓ.ም. ጥቅምት ፳፻፲፱ ዓ.ም.	ጥቅምት ፳፻፲፱ ዓ.ም. ጥቅምት ፳፻፲፱ ዓ.ም.
ጥቅምት ፳፻፲፱ ዓ.ም. ልማት				
ጥቅምት ፳፻፲፱ ዓ.ም. ልማት				✓
ጥቅምት ፳፻፲፱ ዓ.ም.				
ጥቅምት ፳፻፲፱ ዓ.ም. ልማት	✓	→ ጥቅምት ፳፻፲፱ ዓ.ም. →		✓
ጥቅምት ፳፻፲፱ ዓ.ም.				
ጥቅምት ፳፻፲፱ ዓ.ም. ልማት	✓	✓	✓	
ጥቅምት ፳፻፲፱ ዓ.ም. ልማት		✓		
ጥቅምት ፳፻፲፱ ዓ.ም. ልማት		✓		
ጥቅምት ፳፻፲፱ ዓ.ም. ልማት		✓		
ጥቅምት ፳፻፲፱ ዓ.ም. ልማት	✓	✓	✓	

<sup>c</sup>bḏṭlṣḏnḏc:

[illegible][illegible]

- [illegible]

$\angle A = \angle C$ ,  $\Delta ABC \cong \Delta DCB$ .  $\therefore AB = DC$ ,  $AC = DB$ .  $\therefore AC - AB = DB - DC$ .











## 21.0 4D-CT Scanning and Delta-CT

[illegible]



[illegible]



[illegible]



[illegible]



[illegible]



[illegible][illegible][illegible]

ΔΕΥΤΕΡΟ 10Α-1 - ΔΕΠΙΓΕΝΕΣΙΣ, ΔΙΣΔΙΜΟΣ ΔΑΔΕΣΙΣ ΔΕΛΤΑ ΔΕΥΤΕΡΟ ΔΑΔΕΣΙΣ ΑΓΕΝΕΣΙΣ

[illegible][illegible][illegible][illegible]



[illegible][illegible][illegible][illegible]

$\Delta_{\text{CJ}}^{\text{L}} = 10C - \langle \delta A^{\text{e}} \rangle_{\text{CJ}} - \langle \delta L \rangle_{\text{CJ}}$

Δελτίο 10C-1 - Διατάξεις Γενικού Διευθυντή για την Εξέταση των Εγγράφων

[illegible]

ΔεJČ<sup>α</sup> 10C-2 – ρ<sup>α</sup>JΔσ Δε<sup>b</sup>C<sup>α</sup>Δ<sup>b</sup> – Δ<sup>α</sup>ΔΔΔ<sup>α</sup>J<sup>c</sup> Δ<sup>α</sup>ΔCΔΔΔ<sup>b</sup> ΔΔΔΔ<sup>α</sup>Δ<sup>b</sup>Δ<sup>c</sup> Δ<sup>α</sup>ΔJ<sup>c</sup>

[illegible]

ΔεJC<sup>α</sup> 10C-3 - Δ<sup>b</sup>APC<sup>γ</sup>Δ<sup>δ</sup>Γ Δ<sup>b</sup>C<sup>δ</sup>Δ<sup>b</sup> - Δ<sup>δ</sup>Δ<sup>δ</sup>Δ<sup>α</sup>J<sup>C</sup> Δ<sup>δ</sup>NCΔ<sup>δ</sup>Δ<sup>b</sup> ΔΔΔ<sup>α</sup>Δ<sup>δ</sup>Δ<sup>δ</sup>Δ<sup>C</sup> <<sup>δ</sup>ΔJ<sup>C</sup>

[illegible]



[illegible]

Δελτίο 10C-4 - '66 Φορτηγό Δελφίνι < 5.0C

[illegible][illegible][illegible][illegible]

Δεῦτε 10D-1 - Ἀποστολικὴ Ἐκκλησία Ἰερουσαλὴμ ὑπὸ τὴν ἡγεσίαν τοῦ ἀποστόλου Πέτρου καὶ τῶν συναντιῶν ἀποστόλων

[illegible][illegible][illegible][illegible][illegible]



[illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible]



[illegible][illegible][illegible][illegible]

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**MARY RIVER PROJECT  
ENVIRONMENTAL IMPACT STATEMENT**

**PLAIN LANGUAGE SUMMARY**



## **SECTION 1.0 - INTRODUCTION**

These plain language summaries have been developed in response to commitment #6 of the Commitments List put forth to Baffinland by the Nunavut Impact Review Board (NIRB) November 4, 2011, and includes community concerns as drafted by the Nunavut Impact Review Board in Section 2.7 of the *Preliminary Hearing Conference Decision Concerning the Mary River Project* (NIRB File No. 08MN053). For the full list of commitments, see Appendix 1B-5 Concordance with PHC Report Appendix 1.

This document has been made available in both English and Inuktitut. As requested by community members, acronyms in this summary have been eliminated and are spelled out in full.



## **SECTION 2.0 - AIR QUALITY**

### **2.1 WHAT THIS SECTION IS ABOUT**

This section refers to emissions of gases and particulates to the atmosphere. It discusses the baseline conditions in the Regional Study Area (RSA) and the anticipated effects on air quality as a result of the Project.

### **2.2 WHAT WAS STUDIED**

- Existing air quality in the Project area was found to be typical of remote environments.
- Potential effects of the Project on air quality were evaluated using computer models and professional experience.
- Concerns raised by communities about air quality generally focused on the potential effects of the Project on dust.

### **2.3 PREDICTED IMPACTS**

The Environmental Impact Statement considers potential effects from the Project on air quality.

- Potential effect(s) on air quality may include Total Suspended Particulate (TSP or dust), Inhalable Particulate Matter, sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), and carbon monoxide (CO).
- The following effects were predicted:
  - At Milne Port, the main sources of dust emissions are expected to be from sources such as bulk handling operations. Power generation is expected to account for nearly 100% of the sulphur dioxide, nitrogen dioxide and carbon monoxide emissions.
  - Along the Milne Inlet Tote Road, deposition levels in excess of the threshold value are expected to occur over a distance up to 250 m from the centre of the road. At the Mine Site, the primary source of dust emissions will be mobile equipment operating in the pit and on haul roads. Power generation is expected to be the primary source of sulphur dioxide, while mobile equipment will be the largest source of total nitrogen dioxide and carbon monoxide. These combustion sources will also contribute to dust. Other sources include the incinerator and idling locomotives. Aircraft emissions were not assessed due to the intermittent nature of the source.
  - Along the Railway, dust generation is expected to be limited to particles during the loading of rail cars, and is expected to be minimal. No significant windblown emissions are anticipated during rail transportation of the ore.
  - At Steensby Port, the main sources of dust and emissions will be fugitive sources, specifically bulk handling operations (stackers and reclaimers). These were assumed to occur continuously even though precipitation can suppress them. Power generation will account for the majority of sulphur dioxide, nitrogen dioxide and carbon monoxide emissions. Other sources of emissions include the incinerator, idling locomotives and mobile vehicle fleet.



- Although measured levels of an air pollutant higher than the established standards (exceedances) may occur, these would generally be confined to local areas not extending beyond 1.5 km from the Project sites and are fully reversible.
- Transboundary and cumulative effects of the Project on air quality were also considered. The residual effects on air quality will not extend beyond 1.5 km from the Project site. As a result and given the location of the Project no transboundary air quality effects are possible. There are no other sources of emissions within the immediate area that would act cumulatively to affect local receptors such as people and wildlife.

## 2.4 MONITORING AND MITIGATION

- An air quality monitoring program is proposed for each of the main project sites during the first few years of operation to confirm effects predictions.
- A number of pollution controls are proposed to minimize impacts on air quality, including best management practices for limiting air emissions, such as:
  - Using low sulphur arctic grade diesel fuel
  - Limiting driving speeds on roads
  - Enclosing ore crushing equipment and then venting these facilities and equipping them with dust collection equipment
  - Applying a dust suppressant (e.g. water) as required in high traffic areas and on stockpiles
  - Implementing a purchasing policy for equipment (incinerators, generators, vehicles) with lower emission levels or energy saving potential where feasible
  - Using granular material, where possible, for road construction, and
  - Providing regular maintenance of equipment and vehicles.
- A community concern was brought forth regarding the lack of tarps proposed for rail cars to mitigate dust deposition; however, due to the weight and size of the ore, in addition to the speed of the trains, dust is not predicted to be an issue along the rail route and tarps are not necessary

## 2.5 CONCLUSIONS

The proponent has concluded that with monitoring and mitigation, there will not be a significant residual effect of the Project on air quality.



## **SECTION 3.0 - ARCHEOLOGY AND CULTURAL RESOURCES**

### **3.1 WHAT THIS SECTION IS ABOUT**

This section refers to archeological and paleontological resources that have been identified in the Project area, how each will be protected, and, if artifacts are to be removed, what will happen to them.

### **3.2 WHAT WAS STUDIED**

Archaeological studies have been conducted in the Mary River area since 2006, and many sites have been discovered in Milne Inlet, along the Milne Inlet Tote Road, the proposed railway alignment and at Steensby Inlet. Sites are found in the Mary River Mine Site, but no sites are found on the iron deposits. The sites that have been found to date vary greatly in size and significance, from a single tent ring to a site consisting of over 35 stone features of various types including circles, caches and traps, and are important from a cultural, historical, and legal perspective.

### **3.3 PREDICTED IMPACTS**

This part is about:

- The effects of the Project on archaeological and other cultural sites of importance to Inuit.

The Impact Statement says:

- Both Milne Inlet and Steensby Inlet port areas have high densities of archaeological sites. The Philips Creek valley contains a large number of sites which confirms it as an important travel corridor. No sacred places or burial sites were identified or located.
- Project facilities are located whenever possible away from archaeological sites.
- The Company is following all of the regulations and policies set out by the Department of Culture, Language, Elders and Youth (CLEY) and the Inuit Heritage Trust in terms of protection of sites and their contents.
- Project employees will be trained to identify and report potential archaeological sites during construction. Work will be stopped and an archaeologist will be available to confirm finds and recommend mitigation in accordance with the Cultural and Heritage Resources Plan which will be approved by CLEY.

### **3.4 MONITORING AND MITIGATION**

- Baffinland has implemented policies to ensure conduct and mitigation concerning archaeological sites in accordance to standards and permits required by CLEY. The Government of Nunavut and Inuit make clear the importance of these sites, and all employees and contractors will receive training on appropriate protocols.
- In the response to concerns regarding if, when, and how archaeological sites will be disturbed or moved, three mitigation strategies will be used:
  - Avoidance: Avoidance of archaeological resources is the preferred mitigation measure, and has been applied to the Mary River Project design wherever possible.



- Site Protection: Sites which will not be impacted directly, but which are located near Project activities, will be protected through flagging and archaeological constraints mapping.
- Systematic Data Recovery: Sites that cannot be avoided within the development footprint will undergo systematic data recovery. This process includes surface collection, detailed mapping, and subsurface testing to collect information about the site, and recovery of artifacts. This technique is limited to sites that cannot be avoided and is conducted prior to site disturbance. Authorization from CLEY is required prior to initiating any systematic data recovery program.

### 3.5 CONCLUSIONS

It is not anticipated that the Mary River Project, in combination with other foreseeable projects and with traditional harvesting activities, will result in significant negative cumulative effects to archaeological sites. Overall cumulative effects to land and marine use are not expected to be significant. The Project will not result in significant adverse effects. Procedures are set in place to limit the effect of the Project on cultural resources.



## SECTION 4.0 - CLIMATE CHANGE

### 4.1 WHAT THIS SECTION IS ABOUT

This section refers to weather and climate in the Project area, including how the climate is expected to change over time, how these changes could affect the Project and how the Project could contribute to climate change.

### 4.2 WHAT WAS STUDIED

- Baseline climate conditions as well as future predicted changes in climate due to future greenhouse gas emissions, land-use changes and other driving forces were estimated using global climate change models.
- Concerns raised by communities about climate change include how the Project could affect climate change and how climate change might affect the Project.

### 4.3 PREDICTED IMPACTS

The Environmental Impact Statement considers potential effects from the Project on climate change as well as potential effects of climate change on the Project.

- Over the next several decades, precipitation and evaporation in the Project area are both expected to increase due to climate change. The change to the overall moisture input is expected to be minimal.
- Snow depths are not expected to change over the life of the Project.
- Extreme weather (i.e. significant snowdrifts, extreme rainfall events), as well as global climate change, has the potential to affect Project infrastructure and in turn represent concerns for human safety and the environment.
- Overall wind speeds are not expected to change significantly over the life of the Project.
- Changes in sea ice cover due to climate change will not significantly affect the shipping operations in the Foxe Basin.
- Climate change will affect sea levels. Steensby Port is in an area of falling sea levels.
- The permafrost active layer depth is projected to increase by approximately 50% for most permafrost regions in the High Canadian Arctic over the next 100 years. This 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.
- Over its life, the production of greenhouse gases by the Project will increase, potentially by as much as twice the current greenhouse gas emissions for Nunavut. This is not a significant change on a national or global scale.

### 4.4 MONITORING AND MITIGATION

- Potential implications for the stability and safety of infrastructure due to climate change on hydrology and permafrost have been taken into account in the engineering design of the Project.
- The project facilities for Steensby Port will be conservatively designed to account for changes in sea levels.



- Baffinland will attempt to mitigate climate change and reduce the increase in greenhouse gas emissions due to its activities by using arctic grade diesel fuel and rail transportation of ore instead of trucks.
- Baffinland will also explore ways of conserving energy as the Project moves through development and will adapt accordingly.
- Baffinland will also report annually on performance indicators, including energy use and greenhouse gas emissions management by the Project.

#### 4.5 CONCLUSIONS

The proponent concludes that the effects of the Project on climate change are not significant. A cumulative effect on climate change will occur through the release of greenhouse gases. These emissions will be very small compared to national greenhouse gas emissions and insignificant in terms of global greenhouse gas emissions. The effects of climate change on the Project have been mitigated through conservative design of the Project.



## **SECTION 5.0 - FRESHWATER BIOTA AND HABITAT**

### **5.1 WHAT THIS SECTION IS ABOUT**

This section refers to freshwater biota and habitat. It discusses the baseline conditions in the Regional Study Area (RSA) and the anticipated effects on Arctic char, other biota and aquatic habitat as a result of the Project.

### **5.2 WHAT WAS STUDIED**

This work is summarized below.

- Arctic char and ninespine stickleback were the only fish species found in fresh water bodies.
- Landlocked Arctic char were widely distributed and were found in water bodies along the Milne Inlet Tote Road, at the Mine Site, along the Railway, and at Steensby Port.
- Sea-run Arctic char were located in freshwater systems at Milne Port and Steensby Port and in the Cockburn River system.
- Communities raised concerns about the potential effects of the Project on fish in the Regional Study Area.

Information about fish may be found on Figures 5.1 and 5.2 of the theme based maps generated from the Inuit Knowledge Study.

### **5.3 PREDICTED IMPACTS**

The Environmental Impact Statement considers potential effects from the Project on Arctic char, aquatic biota and habitat. The assessment focused on the potential effects on Arctic char.

- The potential for the Project to cause direct mortality of Arctic char (e.g., due to blasting or egg stranding) is expected to be avoided with mitigation measures in place.
- Some habitat change or loss will result from alterations in flows resulting from water diversions. For example, the diversion of water around the waste rock stockpile may result in an 18% reduction in flows to one Sheardown Lake tributary. The effect is not expected to be significant but will be monitored to ensure changes are not detrimental to juvenile Arctic char.
- Direct habitat loss will also occur in streams and lakes from installation of physical footprints, including water intakes, wastewater outfalls, culverts, and bridges, and embankments. These losses will be relatively small.
- Indirect habitat changes and potential loss of productivity can result from activities that affect water quality either in Arctic char habitat or in headwaters that drain to Arctic char habitat. These activities include discharge of effluents, such as treated sewage effluent from the Mine Site and stockpile runoff, introduction of dust, runoff from work areas and infrastructure, blasting, and other non-point sources. Increased sedimentation due to dust deposition or erosion can have an effect on fish habitat or the health and survival of fish eggs. These potential effects are not expected to be significant.



#### 5.4 MONITORING AND MITIGATION

- 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.
- Baffinland is responsible to provide compensation under the *Fisheries Act* in the event of any identified Harmful, Alteration, Damage, and Destruction (HADD) of fish habitat (addressed in the Fish Habitat Compensation Plan).
- Explosives will be required for rock cuts and tunneling along the railway alignment and also for quarrying operations. The *Fisheries Act* and Fisheries and Oceans Canada (DFO) guidelines provide directives to protect fish and fish habitat. These guidelines and directives will be complied with by using alternative explosives and blast designs or excavation methods during construction in or near water at locations that will include Steensby Inlet Port, and the railway (Cockburn Lake). In circumstances where Fisheries and Oceans Canada (DFO) guidelines cannot be met or where there is the potential for Harmful Alteration, Disruption, or Destruction (HADD) of fish habitat, Baffinland will work proactively with Fisheries and Oceans Canada (DFO) representatives.
- Detonation of explosives in or near water can be harmful to fish. To prevent or minimize these effects on fish and in accordance with the *Fisheries Act* and Guidelines, Baffinland and its contractors will identify possible alternatives to the use of explosives in or near water throughout the Project. Less-destructive methods of breaking rock or excavating will be used wherever possible.
- In all phases of the Project, Baffinland will adhere to the No Net Loss principle to prevent or mitigate losses of fish or fish habitat. Habitat compensation will be the measure of last resort only where losses are unavoidable by redesign and mitigation methods. Habitat compensation will be undertaken in consultation with Fisheries and Oceans Canada (DFO) through habitat replacement or enhancement.
- Other examples of mitigation measures include:
  - 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.
  - Since 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.

## 5.5 CONCLUSIONS

The proponent has concluded that with the proposed monitoring and mitigation, the Project will not have significant adverse effects on aquatic ecosystems, freshwater fish and fish habitat including Arctic char. The effects on Arctic char and their habitat will be monitored and any effects are expected to be reversible upon closure of the mine.



## **SECTION 6.0 - HYDROLOGY**

### **6.1 WHAT THIS SECTION IS ABOUT**

This section refers to the natural flow of water through the Project area. It discusses the baseline water flow conditions and the anticipated effects on the flow and quantity of water as a result of the Project.

### **6.2 WHAT WAS STUDIED**

This work is summarized below.

- 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 due to permafrost, and the minimal vegetative cover, surface water is abundant. The region is dotted with thousands of small lakes and streams.
- Community concerns generally focused on the potential changes to water flows and quantities in the Project area and the effects of these potential changes on fish and fish habitat resulting from the Project.

### **6.3 PREDICTED IMPACTS**

The Environmental Impact Statement considers potential effects from the Project on the flow of water in the Project area.

- The removal of water from lakes for water supplies, the diversion of watercourses, or the diversion of runoff into watercourses were identified as potential issues that could affect fish and fish habitat.
- In general, there will be no major alterations in water quantities or drainage paths as a result of the Project (i.e. no dams or major watercourse diversions).
- Culverts installed along the Railway, construction access roads and the Milne Inlet Tote Road will result in minor changes to surface water flows where sheet flow becomes concentrated as it flows through the culverts.
- Water will be withdrawn from several lakes to supply the camps. These withdrawals were estimated to be negligible relative to the amount of water in these lakes.
- Treated effluents from sewage treatment plants and ore stockpile areas will be discharged to the Mary River. These additional discharges are minor relative to the amount of flow in the Mary River.
- Water flow into the open pit is expected to be minor, consisting primarily of direct contribution during precipitation events and blowing snow events. Little, if any, dewatering of the pit will be required during operations. However, excess water that does collect within the open pit will be pumped from the pit to a settling pond.
- Runoff from the waste rock stockpile will be collected and directed to ponds so that solids settle out before the runoff water is discharged to fish bearing waters. The water is expected to be of good quality and will be monitored in compliance with government regulations.



- Some culverts along the Milne Inlet Tote Road, already identified as being prone to blockage, are currently being closely monitored and will undergo resizing during construction activities to help prevent future blockages.
- During closure and post-closure, the Open Pit will be allowed to naturally fill with water to create a pit lake. The filling process should take approximately 85 to 150 years. Once filled, the pit lake will discharge to the Mary River.
- During closure and reclamation of the Project, all drainage and crossing structures along the alignments will be removed and natural drainage paths and water flows will be restored.

#### 6.4 MONITORING AND MITIGATION

- Monitoring of water in the pond collecting the discharge from the waste rock stockpile will verify water quality and water treatment will be carried out to meet established water quality limits if necessary.
- Monitoring will be carried out to confirm that the diversion of runoff from the waste rock stockpile toward Camp Lake does not significantly affect juvenile fish in the stream flowing into Sheardown Lake.
- All new culverts installed along access roads and the Railway will be monitored throughout the life of the Project in order to quickly identify blockages. These blockages will be quickly cleared through high pressure wash.
- Project facilities will be designed to minimize impacts to fresh water quantity and to maintain current drainage patterns as much as possible.
- Baffinland will report annually on water takings and effluent discharge amounts as will be required by its water license.

#### 6.5 CONCLUSIONS

The proponent has concluded that with the proposed monitoring and mitigation measures, the Project will not have significant effects on water quantities in the Project area.



## **SECTION 7.0 - INUIT QAUJIMAJATUQANGIT (IQ) KNOWLEDGE**

### **7.1 WHAT THIS SECTION IS ABOUT**

This section refers to traditional knowledge and its incorporation in the environmental assessment process and the final Environmental Impact Statement document.

### **7.2 COMMUNITY CONSULTATION TO DATE**

- Stakeholder identification for the Project was originally initiated during work on environmental and socio-economic baseline studies in 2004
- Stakeholder identification and initial consultation was achieved by conducting government, institutional and household interviews, carrying out surveys, reviewing statistical data, and hosting community focus group discussions.
- Special care was taken to avoid scheduling engagement sessions during certain times of the year that the community feels are inappropriate, like spring and summer during seasonal time on the land, and the holidays. The Company attempted to avoid conflict and build lasting relationships, while encouraging sharing of all opinions and concerns. Every attempt has been made to have print materials and oral presentations translated.

### **7.3 INUIT KNOWLEDGE STUDIES**

- Facilitated by site visits, workshops, public meetings, etc. The following examples present ways in which Inuit Qaujimajatuqangit was incorporated into the EIS; however, the list is not exhaustive. Many of the VEC summaries include the location of maps created from Inuit Qaujimajatuqangit in the document.
- Baffinland will engage in an “Elder-in-residence” program whereby an Elder can advise on the project

#### **7.3.1.1 Caribou**

- Many terrestrial wildlife species, caribou in particular, are an important part of the Inuit culture and are an important component of a subsistence lifestyle. Inuit Qaujimajatuqangit provided much of the baseline data on caribou, including abundance cycles and herd numbers in the Regional Study Area.
- Data collected to fill key information gaps for caribou included identification of seasonal distributions such as calving areas, migration routes, general habitat use and habitat quality; and behavioural responses to exploration and mine related disturbances.
- Caribou surveys were done in all seasons in order to have a complete understanding of potential Project interactions with caribou
- An continuation of the harvest study is currently in the planning stages and will have opportunities for participation



### 7.3.2 Shipping Route

- Many of the maps found in Volume 8 (Figures 8-4.3, 8-4.4, 8-5.5, 8-5.6, 8-5.7, 8-5.8, 8-5.9, for example) were developed from IQ. In consultation with Inuit and the communities, the shipping route was determined as to have less effect on marine mammals than alternatives.

### 7.4 CONCLUSIONS

Inuit Qaujimajatuqangit has been important in the development of the Project. During construction and operations, the focus of engagement will be on maintaining and improving existing stakeholder relationships, including gathering information on monitoring, mitigation, and management of Project sites, activities, and interactions. Inuit participation will be further supported by a joint Executive Committee between Baffinland and the QIA to oversee the implementation of the IIBA agreement, and a Management Committee to monitor the project on an ongoing basis.



## **SECTION 8.0 - MARINE HABITAT AND BIOTA**

### **8.1 WHAT THIS SECTION IS ABOUT**

This section refers to marine habitat and Arctic Char. It discusses the baseline conditions and the anticipated effects of the Project on the marine habitat and Arctic Char at Milne and Steensby Ports. What Was Studied

This work is summarized below.

- Sea run Arctic Char was the most common species observed in the marine environments of Milne Port and Steensby Port. It was therefore the focus of the assessment on marine habitat and biota.
- Various Project activities that could affect marine fish habitat and Arctic Char in the vicinity of the proposed port sites and were considered including:
  - Discharge of ballast water from supply vessels and ore carriers;
  - Airborne dispersion of dust from ore stockpiles;
  - Discharge of treated wastewater; and
  - The modeled 95% probability distribution of diesel spills (considered in Volume 9 of the Final Environmental Impact Statement, cumulative effects and other assessments).
- Concerns expressed by communities were generally focused on the effects of the Project on fish.

Information about fish and resources is provided in Figure 6.13 from the Inuit Knowledge Study.

### **8.2 PREDICTED IMPACTS**

The Environmental Impact Statement considers potential impacts on marine habitat and Arctic Char from the Project.

- The area of marine habitat directly lost as a result of ore dock footprints at Milne Port and Steensby Port is less than 1% at both port locations.
- Alteration of near shore marine habitat is expected to be less than 0.1% of available habitat and these activities are predicted to have negligible effects on productive capacity at both Milne and Steensby Ports.
- Suspended sediments, potential increases of metals in tissue and discharge of wastewater at both port locations are predicted to have a non-significant potential effect on Arctic Char health.
- Resuspension of sediments due to propwash currents in areas of high vessel activity (i.e., alongside the dock) will decline over time (through construction and into the operational phase) as fine grained particles are redistributed out of those areas. Sediment grain size composition will eventually equilibrate, the seabed will stabilize, and the amount of sediment resuspension will become negligible.
- The effects to Arctic Char habitat are predicted to be low in magnitude and reversible upon completion of the Project.



### 8.3 MONITORING AND MITIGATION

- Baffinland is responsible to provide compensation under the *Fisheries Act* in the event of any identified Harmful, Alteration, Damage, and Destruction (HADD) of fish habitat (addressed in the Fish Habitat Compensation Plan).
- The use of silt curtains will reduce the affected areas during construction and closure activities.
- At Steensby Port, ore stockpile and site runoff will be collected and allowed to settle prior to summer discharge into the marine environment
- Treated sewage effluent will be discharged at depth into Steensby Inlet year-round.
- Compensation for the loss harvesting areas is currently being negotiated with the QIA through the Inuit Impact Benefits Agreement (IIBA).

### 8.4 CONCLUSIONS

- The proponent has concluded that the effects of the Project on marine habitat at both Milne Port and Steensby Port are predicted to be not significant. The Project will have no adverse residual effects on sea run Arctic char in Milne and Steensby Inlets.
- Project activities leading to short-term water quality guideline exceedances would be reversible and related effects on marine habitat (e.g., changes due to ballast water) are also expected to be reversible. As a result, the Project will have no significant adverse residual effects on marine fish habitat. The Project will cause a negligible loss of habitat within Project footprints.



## **SECTION 9.0 - MARINE MAMMALS**

### **9.1 WHAT THIS SECTION IS ABOUT**

This section refers to marine mammals, predominately ringed seal, bearded seal, walrus, beluga whale, narwhal, bowhead whale, and polar bear. It discusses the baseline conditions in the Regional Study Area (RSA) and the anticipated effects on these marine mammals as a result of the Project.

### **9.2 WHAT WAS STUDIED**

This work is summarized below:

- Ringed seals are present year-round along shipping routes from both Milne and Steensby Inlets. Stable landfast ice offers preferred seal habitat for breathing holes and lairs. The seals disperse during open-water periods.
- Bearded seals primarily occur in shallow areas and pack ice. They are seldom found in fast ice areas. They are uncommon in areas of solid fast ice.
- Traditional knowledge indicates that small numbers of walruses are present in Steensby Inlet. Key walrus areas are west of Rowley Island, along the floe edge or on moving pack ice. Walruses also occur in Hudson Strait. Very few are present along the shipping route in Eclipse Sound and Milne Inlet. About half of the footprint of the Steensby Port dock is unsuitable as walrus habitat.
- Narwhals are more common in the northern area of the Regional Study Area. About 20,000 summer in the Eclipse Sound and Milne Inlet area where they are thought to calve and feed. Relatively few narwhals have been present in Foxe Basin. They are thought to overwinter in the eastern portion of Hudson Strait.
- Hudson Strait is an important overwintering area for bowhead whales and north-western Foxe Basin is considered a nursing area. Milne Inlet, Eclipse Sound, and to a lesser degree Koluktoo Bay are used by bowhead whales.
- Polar bears are abundant in northern Foxe Basin including the shorelines of Steensby Inlet and Koch, Rowley and Bray islands. A small number of polar bears are expected to occur in Milne Inlet and Eclipse Sound during the open-water season. Elders have noted that the southeastern portion of Steensby Inlet provides good denning habitat. Polar bears also overwinter in Hudson Strait.
- Community concerns about ringed seal focused on potential disturbances from the Project caused to ringed seal pups on landfast ice.
- Community concerns over walrus focused on their potential displacement and disruption along the shipping route and dock in Steensby Port.
- Community consultations about beluga whales noted that shipping might frighten them and that they potentially move closer to shore in response to ships.
- Community concern on narwhals focused on the potential negative effect of shipping on them.



- Communities also expressed concern about potential Project effects on bowhead whales.
- Community members noted that shipping would not directly affect polar bears but that Project effects on their prey may cause polar bears to seek food in other areas.

Marine mammals may be found on Figures 3.1 through 3.16 of the theme based maps generated from the Inuit Knowledge Study.

### 9.3 PREDICTED IMPACTS

The Environmental Impact Statement considers potential effects from the Project on marine mammals including ringed seal, walrus, beluga whale, narwhal, bowhead whale, and polar bear.

#### **9.3.1 *Ringed Seals***

- Project activities such as construction, vessel traffic, ice breaking, and aircraft overflights may cause disturbances to ringed seals.
- Ringed seals are generally tolerant of on-ice industrial activity and shipping. They are potentially susceptible to disturbance when giving birth and nursing pups. Ringed seal habitat will be changed through ice breaking activities only in locations where vessels transit.
- The acoustic modeling results and mitigation plans indicated that ringed seals are not expected to be exposed to sound levels high enough to cause hearing impairment.
- Mortality from shipping collisions is expected to be limited in the ice cover season. In the open water season ringed seals exhibit localized avoidance and are not expected to be affected by collisions.
- The effects of the Project on ringed seals are not expected to be significant.

#### **9.3.2 *Bearded Seals***

- The shipping route does not overlap with landfast ice in Hudson Strait, and only a small portion of the landfast ice edge will be changed at the entrance to Steensby Inlet.
- Evidence of the ship track in the mobile pack ice will quickly disappear because of the movement of ice by wind and tides and it is assumed that bearded seals will re-use the ice.
- Construction activities, vessel traffic, icebreaking, and aircraft overflights have the potential to interact with bearded seals.
- Bearded seals are not expected to be exposed to a level of sound high enough to cause hearing impairment.
- Mortality from ship collisions is expected to be minimal during ice cover season and non-existent during open water season as bearded seals exhibit localized avoidance.
- The effects of the Project on bearded seals are not expected to be significant.

#### **9.3.3 *Walrus***

- Construction activities, vessel traffic, icebreaking, and aircraft overflights may potentially cause disturbance to walrus. Evidence indicates that walrus exhibit localized avoidance of vessels and



variable responses to aircraft. The disturbances from these activities are not expected to affect calving areas west of Rowley Island.

- Less than 2% of total landfast ice edge leading into Steensby Port and less than 1% of pack ice in Hudson Strait will be changed as a result of the Project.
- Walrus are not expected to be exposed to sound levels causing hearing impairment.
- No mortality of walrus is expected to occur as a result of the Project.
- The effects of the Project on walrus are not expected to be significant.

#### **9.3.4 Beluga Whales**

- Habitat change may result from the passing of ore vessels through Hudson Strait when beluga whales over winter in the area. The change to the pack ice will be temporary. The changes to habitat caused by dock structures and temporary changes to overwintering habitat are below the threshold value and are predicted to be not significant.
- Beluga responses to industrial activities are variable. It is predicted that with mitigation measure in place disturbance effects on belugas from construction, shipping and aircraft overflights will not be significant.
- Beluga whales are not expected to be exposed to sound levels from construction activities that could cause hearing impairment. With mitigation hearing impairment effects on beluga whales are predicted to be not significant.
- No mortality of beluga whales is expected to occur as a result of the Project.
- No significant effects of the Project on beluga whales are expected.

#### **9.3.5 Narwhal**

- The interaction of the Project with the narwhal population is limited to shipping activities in Milne Inlet during the open water season.
- The change in habitat as a result of dock structures at Steensby and Milne Ports will be a small footprint of the available marine habitat in the respective area.
- The shifting of pack ice in Hudson Strait will be limited as currents and wind will restore pack ice distribution.
- In general disturbance effects on narwhal resulting from construction, vessel traffic, icebreaking, and aircraft overflights with mitigation are not significant. There is no obvious evidence that narwhals immediately abandon an area transited by a vessel.
- Narwhals are not expected to incur hearing impairment as a result of Project activities including construction and shipping.
- No mortality of narwhals is expected to occur as a result of the Project.
- No significant effects of the Project on narwhals are expected.



### **9.3.6 Bowhead Whales**

- Based on studies of bowhead response to ships and icebreakers, they will likely avoid at least the immediate area around ships.
- The change in habitat caused by dock structures and temporary decrease in bowhead overwintering habitat will be relatively small.
- Bowhead whale responses to industrial activity are variable. With mitigation in place disturbance effects on bowhead whales from construction, shipping, and aircraft overflights are not expected to be significant.
- Bowhead whales are unlikely to occur within 25 m of construction activities as such hearing impairment resulting from sound levels is unlikely. Bowhead whales are not predicted to be close enough to ore carriers to suffer from hearing impairment. The effect of hearing impairment on bowhead whales is predicted to be not significant.
- No mortality of bowhead whales is expected to occur as a result of the Project.
- No significant effects of the Project on bowhead whales are predicted.

### **9.3.7 Polar Bears**

- The interaction of the project with the polar bear population will be limited.
- Polar bears might avoid or approach ships and port sites. The change in habitat in landfast ice in Steensby Inlet and Foxe Basin as a result of the Project represents 5.6% and 0.36% respectively of suitable polar bear habitat. The change in pack ice is less than 1% of pack ice in Hudson Strait, Foxe Basin, and near Steensby Port.
- The disturbance effects on polar bears from construction, shipping, and aircraft overflights are expected to be not significant.
- There is a risk of polar bear mortality as a result of polar bear and human interaction. However, mitigation measures will be in place to reduce risk of a bear encounter, chances that a bear would have to be killed in defense of human life. With mitigation no mortality of polar bears is expected to occur.
- No significant effects of the Project on polar bears are predicted.
- As part of the review of the Draft EIS, the Government of Nunavut indicated to Baffinland that additional studies on polar bear should be used in the effects assessments of the Final EIS. The Government of Nunavut provided parts of these draft studies to Baffinland and this information was used in the assessment presented in Volume 8 of the Final EIS. Polar bears being listed as a Species at Risk does not change the methodology used to assess effects of the Project on Polar Bear. The conclusion of the potential effects of the Project remains that it is not expected that the Project will have a significant residual effect on Polar Bear.



#### 9.4 MITIGATION MEASURES

- Blasting during pupping and nursing periods for ringed seals will be mitigated.
- To reduce sound transmission from blasting, an underwater bubble curtain will, as necessary, be employed.
- Dock structures were designed to minimize the footprint in the marine environment.
- Icebreaking vessels will control the width of the shipping lane by moving along the same track as much as possible through landfast ice in Steensby Inlet.
- The shipping lane into Steensby Port will be delineated with markers to notify the ship's crew of the boundaries of previous vessel track lines.
- Icebreaking tugs and ore carriers will minimize the area of broken landfast ice at the Steensby Port to the extent possible.
- Vessels will maintain a constant course and appropriate speed
- Ore carriers have a modern design that is expected to limit noise output.
- Vessels will minimize idling of engines when docked at Milne and Steensby ports.
- Except during takeoff and landing, Project aircraft will be operated at a minimum altitude of ~450 m over marine areas, when weather conditions allow. In addition, aircraft will be prohibited from flying low over wildlife for passengers to 'get a better look' or for photography.
- Project personnel will be educated about bear safety.
- Strict management of waste will reduce the changes of human-bear interaction.
- Polar bear monitors will be used to ensure worker safety.
- Baffinland will participate with Inuit and other agencies to support monitoring initiatives related to changes in Inuit land-use and harvesting, and associated culture and skills, by making available relevant data the Company generates.
- Compensation for the loss of mammals and harvesting areas is currently being negotiated with the QIA through the Inuit Impact Benefits Agreement (IIBA).

#### 9.5 CONCLUSIONS

The proponent has concluded that with monitoring and mitigation measures, the Project will not significantly affect marine mammals.



## **SECTION 10.0 - MARINE WATER AND SEDIMENT QUALITY**

### **10.1 WHAT THIS SECTION IS ABOUT**

This section refers to marine water and sediment quality. It discusses the baseline conditions and the anticipated effects of the Project on the marine water and sediment quality around Milne and Steensby Ports.

### **10.2 WHAT WAS STUDIED**

This work is summarized below.

- The baseline water quality of Milne Inlet and Steensby Inlet was nearly neutral (pH around 7), hard, and clear with moderate amounts of nutrients. Nutrient concentrations were generally typical of nearby arctic waters.
- The major elements in water samples collected from Milne Inlet and Steensby Inlet reflect those typical of marine waters (e.g., chloride, sodium, sulphate, magnesium, etc.). Several metals (including cadmium and iron) are present in such low concentrations that they are generally below the analytical level of detection.
- Baseline mercury concentration at Milne Inlet exceeded the Canadian Council of Ministers of the Environment guideline for the protection of marine aquatic life in two samples collected from Milne Inlet.
- Sediments in shallow areas of Steensby Inlet tended to have a higher amount of coarse material than those in deeper areas; this was not observed for Milne Inlet sediments.
- Metal concentrations are higher in sediments with a higher proportion of fines and are similar to concentrations reported in literature.
- Petroleum compounds measured in Milne Inlet were low, also reflective of the literature.
- Baseline concentrations of arsenic, cadmium, chromium, copper, lead, mercury, and zinc at Milne Inlet were always below Probable Effects Levels and Interim Sediment Quality Guidelines identified in the Canadian Council of Ministers of the Environment (CCME) Canadian Sediment Quality Guidelines for the Protection of Aquatic Life.
- Baseline metal concentrations at Steensby Inlet were higher in sediments with higher proportions of fines, similar to trends observed in previous studies of the region.
- Baseline concentrations of arsenic, cadmium, chromium, copper, lead, mercury, and zinc at Steensby Inlet were always below Probable Effects Levels and most were below the Interim Sediment Quality Guidelines.
- Concerns expressed by communities generally focused on the effects of spills, contamination and pollution from the Project on the marine environment.



### 10.3 PREDICTED IMPACTS

The Environmental Impact Statement considers potential impacts on marine water and sediment quality from the Project.

- Activities that occur at Milne and Steensby Inlets during the construction, operation, or decommissioning phases of the Project that could potentially alter water or sediment quality include:
  - Construction of docks;
  - Disruption and erosion of sediments by barge and ship traffic;
  - Discharge of ballast water;
  - Emission of dust from ore stockpiles; and
  - Runoff and discharges from land based Project activities such as wastewater, stockpile run-off, and site water.
- Dust can affect marine water and sediment quality by settling onto water bodies. Dust will be present year-round at Steensby Port and during winter dust may accumulate on nearby ice and snow. Milne Port will only be in operation during the open water season when dust deposition could cause low level increases in levels of metals and thereby affect water quality in local areas of fresh and salt water. At Steensby Port, dust deposition may result in occasional increases in metals and Total Suspended Solids (TSS).
- Run-off from the port sites to the adjacent marine environment will occur during all phases of the Project, due to land based activities such as travel on roads, ground disturbance, dusting and snow management.
- Construction at Milne Port and at Steensby Port may cause localized and temporary increases in Total Suspended Solids (TSS) and associated nutrients and metals in water.
- Ships' propellers can also affect sediments in the port waters by stirring up the seabed in relatively shallow water. This may increase total suspended sediment, nutrient levels, and metal levels in the water column. Because of the relatively small size of the area affected, the barge and ship traffic at both Steensby and Milne Ports are not predicted to significantly affect water quality.
- No negative effects to water or sediment quality at the dock side due to ship discharges are predicted because vessels will be operated and maintained in compliance with pollution prevention laws and regulations which prohibit discharge of bilge water or sewage while at the dock side.
- In order to reduce or eliminate the risk of invasive aquatic species and pathogens being introduced into Canadian waters as a result of shipping, all ships will exchange ballast water in accordance with the *Ballast Water Control and Management Regulations* (Transport Canada 2006). The regulations require that ships transiting to Canadian ports exchange ballast water at sea in deep water away from coastal zones. This measure limits the potential for foreign harmful aquatic organisms or pathogens to be released in Canadian waters where they may colonize.



- Upon arrival at the port, the ships will discharge ballast water to allow for filling the ship with ore. Ships will meet all future regulatory requirements for the treatment of ballast water using methods identified by Transport Canada.
- Ballast water will be pumped from each ore carrier when it arrives at Steensby Port. This water will have a slightly higher temperature and salinity than the surrounding water at each port. The pumped water will settle to the sea floor and result in small changes in the area.
- At Milne Inlet water quality could be affected by the following land based discharges:
  - Treated sewage effluent
  - Treated melt water from the tank farm containment area, and
  - General site drainage.

These sources can be expected to result in decreases in water quality with respect to metals levels, pH, and/or total suspended sediment. In all cases, the discharges will rapidly dilute in the environment. No effects on sediment quality are anticipated.

- At Steensby Port water quality could be affected by three land based discharges:
  - Sewage wastewater
  - Ore stockpile runoff, and
  - General site drainage.

As these sources will all be treated prior to release, few decreases in water quality are expected.

- Once the Project is decommissioned, the removal of docks and other structures at Steensby and Milne Ports could result in reductions of both water and sediment quality.

#### 10.4 MONITORING AND MITIGATION

- The use of silt curtains in waters will reduce the affected areas during construction and closure activities.
- At Steensby Port, ore stockpile and site runoff will be collected and allowed to settle prior to summer discharge into the marine environment
- Treated sewage effluent will be discharged at depth into Steensby Inlet year-round.
- Sewage, oily water, truck wash, maintenance facilities and explosives equipment washwater will all be treated prior to discharge into the marine environment.
- Emergency and Spill Response Plans will be in place to deal with all land-based and shipping unplanned events.
- No discharge of ship waste will be permitted at dock side.
- Dust suppression and dust control measures will be in place to limit emissions of particulates to the atmosphere that could settle in port waters.



#### 10.5 CONCLUSIONS

The proponent is moderately confident that the Project will not cause significant adverse effects on marine water and sediment quality in Milne Inlet and Steensby Inlet.



## **SECTION 11.0 - MIGRATORY BIRDS AND HABITAT**

### **11.1 WHAT THIS SECTION IS ABOUT**

This section refers to birds and bird habitat. It discusses the baseline conditions in the Regional Study Area (RSA) and the anticipated effects on migratory birds and habitat as a result of the Project.

### **11.2 WHAT WAS STUDIED**

This work is summarized below.

- Harvesting birds and their eggs is important to the residents of North Baffin Island.
- Key indicator bird species were selected to focus the assessment of Project effects. The selected species include Peregrine Falcon (a cliff-nesting raptor commonly found in the area), Snow Goose and Common and King Eider (waterfowl species harvested by Inuit), and Red-throated Loon (commonly found in the area and a species that is sensitive to changes in water quality and disturbance and therefore a good species to monitor during the life of the Project).
- No large seabird colonies or large feeding flocks were identified around the shoreline and waters of Milne Inlet and Steensby Inlet.
- Concerns raised by communities generally focused on the potential effects of the Project on bird behaviour, migrations, lifecycle, nests and locations and diets.

Bird maps may be found on Figures 4.1, 4.2 and 6.12 of the theme based maps generated from the Inuit Knowledge Study.

### **11.3 PREDICTED IMPACTS**

The Environmental Impact Statement considers potential effects from the Project on migratory birds and habitat.

- Migratory birds may be affected by the Project due to loss and changes in habitat, potential mortality (i.e., bird strikes with aircraft; nest disruption during ground disturbances), and potential influences on health.
- Habitat will be affected through direct loss of habitat due to the Project area which will be unavailable for use by species.
- Indirect habitat loss will occur as a result of Project related activities such as dust, noise, increased human presence, the Railway, and shipping lanes.
- The potential effects on falcons, geese, eiders, and loons is expected to be low and localized to a small zone of influence relative to the amount of suitable habitat available to these species.
- Mortality could potentially occur as a result of project activities through collisions with vehicles, aircraft, or permanent structures. This is expected to occur to individuals without significant effects on the overall populations. Hunting may also result in bird mortality; however as hunting in the area by workers will not be allowed, this is not expected to have a significant effect on bird populations.



- The potential for contaminants released by the Project affecting the health of birds was determined to be low.
- Ships travelling through Eclipse Sound, Foxe Basin and Hudson Strait could come in contact with large colonies of seabirds, but it is unlikely that ship presence will affect these populations.

#### 11.4 MONITORING AND MITIGATION

- Ground disturbance activities will be planned to take place outside the breeding season to minimize the effects of the Project on the key indicator species.
- The footprint of Project facilities will be minimized to limit ground disturbance.
- All employees will be required to take an awareness program will about the importance of avoiding known nests and nesting areas and large concentrations of foraging and moulting birds.
- Where possible, aircraft approach and departure flight paths will be charted to avoid birds.
- Where possible, a 500 metre radius will be maintained around nests until fledging takes place.

#### 11.5 CONCLUSIONS

With mitigation measures, the Project will not have a significant effect on habitat loss, mortality and health of key indicator bird species including Peregrine Falcons, Snow Geese, Common and King Eiders and Red-throated Loons.



## **SECTION 12.0 - NOISE AND VIBRATION**

### **12.1 WHAT THIS SECTION IS ABOUT**

This section refers to noise and vibrations. It discusses the baseline conditions in the Regional Study Area (RSA) and the anticipated effects on noise and vibration as a result of the Project.

### **12.2 WHAT WAS STUDIED**

This work is summarized below.

- Baseline noise levels in the Project area are typical of remote environments with no existing local sources of industrial noise or vibration.
- Project vibration sources were identified, quantified and modelled to assess the effects of the Project on ground-borne vibration that may be perceptible to humans or wildlife.
- (Potential effects of vibration to fish and marine mammals are addressed within the freshwater and marine aquatic environments discussions.)
- Concerns raised by communities generally focused on the potential effects of the Project on noise and blasting.

### **12.3 PREDICTED IMPACTS**

The Environmental Impact Statement considers potential effects from the Project on noise and vibrations in and around the Project area.

- Hunters or community members camping near the cabin to the east of the Milne Port site will likely hear noise from the Project. Due to the proximity of the camping location to a stream and to the ocean, it is likely that this area already experiences similar background noise levels.
- Elevated noise levels may occur near construction activity at the Mine Site, Milne Port, and Steensby Port and along the Tote Road and Railway which may affect human and wildlife receptors. There is a potential for construction noise to extend outwards a distance of up to 1.5 km from the Potential Development Area (PDA).
- The operation of project facilities, including the Mine Site and ports, and transportation links such as roadways and the Railway, will generate noise, which may affect any human and wildlife receptors nearby.
- Due to the localized and intermittent nature of aircraft noise, noise effects from aircraft are expected to be minor.
- Decommissioning of project facilities may generate noise similar to that generated during construction, which can affect human and wildlife receptors.
- Noise modelling during summer and winter during the operations phase predicted minor average hourly sound levels from truck traffic along the Tote Road.
- Predicted average hourly sound levels from movement of the train along the rail corridor are expected to be minor and localized due to the intermittent and temporary nature of this activity.



- With mitigation measures, effects from the project are considered to be minimal for noise. The extent of effects is limited to areas directly surrounding the Mine Site, Steensby Port, and Milne Port. Effects occurring outside of these sites have short duration, and are infrequent. Noise effects are considered to be reversible.
- Construction activities at the Mine Site, Milne Port, and Steensby Port and along the rail corridor have the potential to generate vibration levels that extend outwards from blasting activities. However, there are no vibration sensitive environmental receptors in those areas. Therefore, significant vibration effects on land are not anticipated.
- The duration of the effect on vibration from construction activities is short term, the frequency of the effect is occasional and the effect is reversible.
- To limit potential vibration effects from blasting on freshwater fish in watercourses along the railway measures will be taken to maintain blasting below the Department of Fisheries and Oceans guideline of 100 kPa.
- Open pit mine operations, including blasting, and railway loading/unloading and transit operations at the Mine Site have the potential for local vibration effects. Vibrations during these activities are expected to be minor with the exception of blasting at the pit working face. In general, operational vibration levels are potentially perceptible but are not of concern.
- There are no major sources of vibration associated with the Milne and Steensby Port operations, and therefore no notable vibration effects are expected.
- Vibration effects from truck traffic along the Milne Inlet Tote Road, during the operations phase, are not anticipated.
- During operations, trains may produce significant amounts of vibration. However, due to the intermittent and temporary nature of rail activity, significant effects are not anticipated.
- Vibration effects are not predicted to have significant effects during the closure phase.
- Residual effects from the Project are considered to be minimal for vibration. The extent of effects is limited to areas directly surrounding the Mine Site, Steensby Port and Milne Port sites. Vibration effects are considered to be reversible.

#### 12.4 MONITORING AND MITIGATION

- Standard noise reduction measures will be implemented, including enclosing ore crushing equipment, operating generators and mobile equipment such as trucks with standard mufflers, and performing regular maintenance of engines and equipment vehicles.
- A noise monitoring program is proposed for each of the main Project areas to verify effects predictions.
- No specific vibration controls are required for effects on land.
- Blasting will be maintained below the Department of Fisheries and Oceans guideline of 100 kPa to limit potential vibration effects from blasting on freshwater fish in watercourses along the railway.



## 12.5 CONCLUSIONS

The proponent has concluded that with monitoring and mitigation measures, there will not be a significant effect of the Project on noise and vibration.



## **SECTION 13.0 - SEA ICE**

### **13.1 WHAT THIS SECTION IS ABOUT**

This section refers to sea ice. It discusses the baseline conditions and the anticipated effects on sea ice in Hudson Strait, Foxe Basin and Steensby Inlet as a result of year-round shipping by the Project.

### **13.2 WHAT WAS STUDIED**

This work is summarized below.

- Each winter extensive ice forms along the coastal areas of Foxe Basin and Hudson Strait. Landfast ice extends throughout Steensby Inlet as far south as Koch Island. Much of Foxe Basin and Hudson Strait are covered by moving pack ice.
- Stable areas of landfast ice provide important hunting areas for Inuit.
- The distribution of sea ice and its relationship to open water plays an important role in determining the distribution, movement patterns, and abundance of marine biota. Microalgae and associated secondary producers establish on the bottom of the ice each spring, providing forage for fish such as Arctic cod and for seabirds.
- Concerns raised by communities focused on the potential that ice-breaking associated with year-round shipping would cause disturbance to sea ice which, in turn, could affect Inuit travel and hunting activities as well as animals (such as marine mammals and seabirds) that are associated with, and rely on, sea ice and sea ice edges for various life history functions.

Information about sea ice is provided in Figures 3.19 and 3.20 from the Inuit Knowledge Study.

### **13.3 PREDICTED IMPACTS**

The Environmental Impact Statement considers potential impacts to sea ice from the Project.

- Ice breaking will occur along the length of the nominal shipping corridor and the primary interaction between the Project and sea ice will be physical alteration or disturbance due to the passage of the ship. Other effects due to ice breaking, particularly increased underwater noise, will have no effect on the sea ice itself, but will interact with marine biota associated with the ice.
- Construction activities on ice will have no effect on landfast ice beyond the immediate work areas.
- Less than 1% of the Local Study Area and less than 0.5% of the Regional Study Area pack ice will be disturbed by ice breaking ore carriers during operation. Since pack ice is in constant motion, the ship track through pack ice will quickly close leaving little evidence of the passage.
- Due to density differences between ballast water and water in Steensby Inlet, it is anticipated that ballast water will have little or no effect on ice except right at the dock side where it is discharged.
- Annual icebreaking activity will cause physical alteration of landfast ice in Steensby Inlet. It is predicted that a maximum of 6.1% of the landfast ice in Steensby Inlet and less than 0.5% of the landfast ice in Foxe Basin and the Regional Study Area will be affected by shipping. The effects on integrity of landfast ice are not predicted to be significant.



#### 13.4 MONITORING AND MITIGATION

- The width of the shipping lane through fast ice will be minimized to the extent possible. The shipping lane into Steensby Port will be delineated with markers that can serve to identify the boundaries of previous vessel tracks and act as a guide for the vessel.
- Icebreaking tugs and ore carriers will restrict their area of operation to the extent practical such that the total area of broken landfast ice at the Steensby Port is limited.

#### 13.5 CONCLUSIONS

The proponent has concluded that with monitoring and mitigation measures, the Project will not have significant negative effects on sea ice or on the landfast ice regime because of the relatively small amount of ice that will be disrupted. Although there will be some alteration of landfast ice in Steensby Inlet due to unavoidable ice breaking activities, the area of disrupted ice in relation to local and regional areas is small and will not have any consequential effects on the local or regional ice regime.



## **SECTION 14.0 - LANDFORMS, SOILS AND PERMAFROST**

### **14.1 WHAT THIS SECTION IS ABOUT**

This section refers to landforms, soils and permafrost. It discusses the existing conditions in the Regional Study Area (RSA) and the anticipated effects on landforms, soils and permafrost as a result of the Project.

### **14.2 WHAT WAS STUDIED**

This work is summarized below.

- Topography varies across the Project's Regional Study Area (RSA).
- The geology on or near the surface of the area consists of sediments of glacial, river, or marine origin, with occasional outcrops of bedrock and sedimentary rock formations.
- The thickness of the active layer (upper portion of soil that thaws each summer) varies across the region and is typically between 1 to 2 m thick in the Project area depending on the local soil cover.
- Soils throughout the Regional Study Area were found to be generally poor in nutrients.
- Permafrost thickness in and around the Regional Study Area is deep, typically in the 400 to 700 m depth range.
- In the Regional Study Area, the most common sensitive landforms are thaw sensitive soils and massive ice deposits.

### **14.3 PREDICTED IMPACTS**

The Environmental Impact Statement considers potential effects from the Project on landforms, soils and permafrost.

- Project activities that have the potential to affect sensitive landforms include:
  - Fills over existing ground
  - Excavation
  - Backfilling
  - Various uses of water including water intake, ponding, etc., and
  - Berms.
- Soil destabilization and erosion are potential effects in all areas where the naturally occurring topography and soils are altered as a result of Project implementation. Soil destabilization and erosion effects are expected to be minor.
- No major eskers (a long, narrow ridge of coarse gravel deposited by a stream flowing in or under a decaying glacial ice sheet) or wetlands within the LSA will be affected by the Project
- The Project infrastructure, dust generated, and noise will be the main project components and activities that will affect aesthetics during the life of the Project.



#### 14.4 MONITORING AND MITIGATION

- Geotechnical investigations will continue to be carried out to avoid, where possible, locating project activities on sensitive landforms.
- Foundations will be designed to protect the underlying permafrost from degradation due to construction and to adjust to any changes caused by climate change.
- Stream crossing structures will be designed to accommodate extreme flooding events.
- Drainage systems will be designed to provide adequate drainage and prevent ponding of water.
- The Project sites will be built in a manner that does not disturb sensitive landforms outside the Potential Development Area (PDA).
- Permafrost protection measures for the waste stockpiles will be designed for potential effects of climate changes.
- Waste stockpile slopes will be monitored on an ongoing basis during operations. Any cracks that develop will be monitored and repaired as required to minimize inflow of surface water and ice wedge formation within the stockpiles.
- Best Management Practices will be used for sedimentation and erosion control.
- A sediment control monitoring program will be implemented to detect potential issues arising from soil destabilization and erosion and assess whether these changes are naturally occurring variations (e.g., suspended sediment increases during spring thaw) or Project-related effects.

#### 14.5 CONCLUSIONS

The proponent is highly confident that with mitigation, the Project will not have a significant effect on sensitive landforms.



## SECTION 15.0 - PORT LOCATION AND ALTERNATIVES ASSESSMENT

### 15.1 WHAT THIS SECTION IS ABOUT

This section refers to the rationale behind the selection of Steensby Inlet as the preferred deep sea port, and discussion on the assessment of alternative port locations.

### 15.2 WHAT WAS STUDIED

Viable alternatives for the development of the Mary River Project must meet the following criteria: technical feasibility, environmental acceptability, social acceptability, and profitability for the proponent

### 15.3 SEASONAL SHIPPING

During the review of the Draft Environmental Impact Statement, some agencies requested that seasonal shipping of iron ore be considered as an alternative to year round shipping. For this Project to be economically viable there is a requirement to mine, transport by rail and ship 18 Mt/a. Seasonal shipping implies that in addition to a larger shipping port facility, the Project would have to support the construction and operation of a second port facility. A much larger production rate would be required in order to support the capital cost and operating costs associated with a larger shipping port and an additional port facility.

### 15.4 PORT SITE LOCATION

In order to deliver a constant and reliable supply of iron ore to its customers, the port facility must be accessible year round. As discussed, **seasonal shipping is not a viable alternative for this Project.** The selected port must accommodate cape size ships with ice breaking capabilities. Several potential port locations on Eastern Baffin Island have been evaluated for suitability of the port site.

#### 15.4.1 East and North Cost of Baffin Island

The Northern and Eastern Baffin Island locations do not meet the criteria of “technical feasibility” with respect to: uninterrupted year round access to the port, navigability in the narrow fjord by the large ore carriers, and environmental and safety concerns related to access to the port sites through the dense ice pack at certain times of year.

### 15.5 YEAR ROUND SHIPPING VIA FOXE BASIN

Shipping via Hudson Strait and Foxe Basin is required. Rail transportation is the best means for transportation of large volumes of iron ore over long distances. Several railway alignments were evaluated on the basis of the technical and environmental acceptability. The alignment retained offers the optimal combination of technical, environmental and cost considerations.

During the review of the Draft Environmental Impact Statement, some Inuit proposed the port location be moved from Steensby Inlet to Nuvuit. As a consequence of this concern the following actions were taken:

- In 2011 the company held a series of meetings in Igoolik;
- The Company requested Canarail to prepare a technical review assessing the proposed routes;
- The QIA initiated an independent review of the Canarail Report;

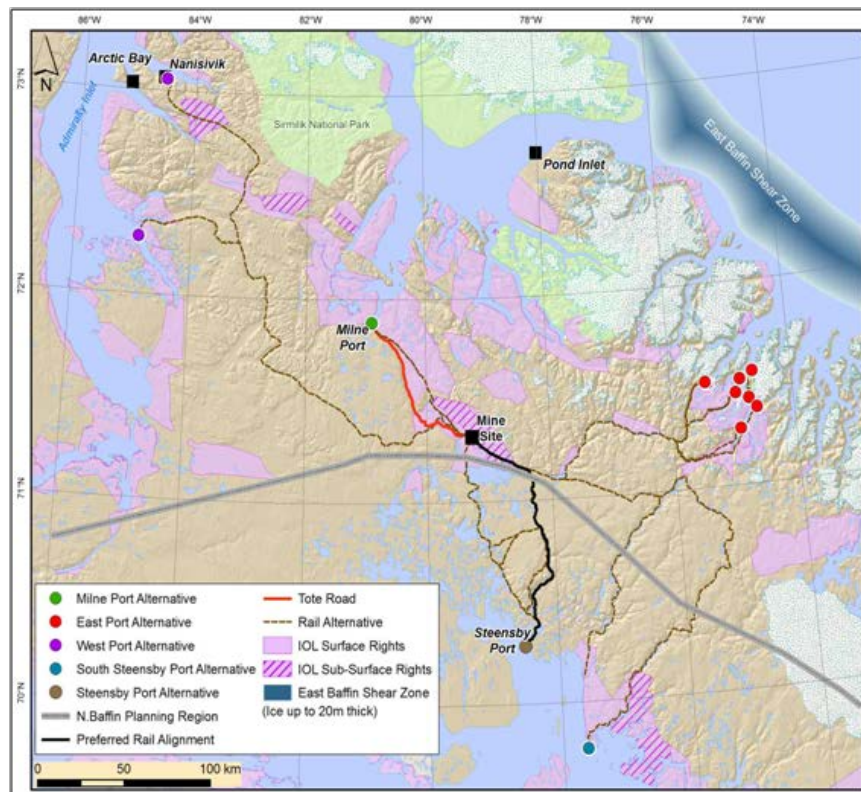


- In September the Company hosted a site visit to tour and compare the two alternatives; and
- The QIA requested their financial advisors evaluate the implications of various alternatives on the project's rate of return

Adopting Nuvuit as the port site would have the following impacts on the Project:

- An extension of the railway by 325 km to Nuvuit which would increase building costs by almost \$2 billion;
- The construction schedule would be extended by two years which greatly reduces the attractiveness of the Project being developed;
- The operating and maintenance costs would more than double (i.e., seven trains instead of three); and
- A larger dock structure would be needed at Nuvuit to reach deep water thus further increasing cost.

The project capital and operating cost cannot support a rail route to Nuvuit. Economic factors of a rail link to Nuvuit make the alternative unviable.



**Figure 1 Port Locations Studied**



## 15.6 CONCLUSIONS

Therefore, on the basis of “technical feasibility”, “environmental acceptability” and “profitability for the Proponent”, the location of the port at Steensby Inlet is the preferred alternative for the Mary River Project.



## **SECTION 16.0 - EMERGENCY AND SPILL RESPONSE AND HAZARDOUS MATERIALS**

### **16.1 WHAT THIS SECTION IS ABOUT**

This section refers to the potential impact of an accidental fuel spill and response plans, including consideration for the role of communities in emergency response. This includes an explanation of notification for communities in the event of an emergency or spill. In addition, community members indicated concern regarding potential for hazardous materials from the Project to enter into the environment.

### **16.2 MONITORING AND MITIGATION**

- An Emergency Response team will be comprised of site employees who receive special training to assist in an emergency, including:
  - implementing onsite safety and emergency response procedures
  - responding to emergencies involving injuries and fatalities
  - assisting with evacuation procedures
  - responding to emergencies involving fires or explosions
  - controlling and mitigate spills or other accidental releases
  - ensuring the safety of employees during extreme weather conditions
- Should an emergency and/or spill occur, communities and stakeholders will be informed via a number of proactive notification measures. Project activity updates will be provided to the communities of North Baffin through various means including regular meetings, public notices and radio announcements as appropriate. Baffinland will endeavor to maintain Baffinland Liaison Officers to assist in this regard.
- Baffinland will be self-sufficient for Search and Rescue operations (SAR) and respond to environmental emergencies as it relates to the project, but will share information with the RCMP and GN Department of Justice. This will be fully addressed in a future Search and Rescue plan.
- External organizations, including communities, will be invited to participate in training exercises during various stages of the project.
- Prevention of hazardous materials entering the environment are mitigated through proper handling and storage, which is detailed by waste type in great detail in the Hazardous Materials and Hazardous Waste Management Plan

### **16.3 CONCLUSIONS**

Baffinland will make every effort to ensure the safety of employees and communities in the event of an emergency. One of the most important aspects of emergency response is effective planning and preparedness. Preparedness means having equipment ready to deploy, training and exercises for staff, and identified responders. Monitoring and mitigation plans have been created for many project locations and activities to prevent hazardous materials from entering the environment, and readers are directed to Section 21.0 of this document for a description of all management plans as part of the Final Environmental Impact Statement (FEIS). These plans include, but are not limited to, the Emergency Spill

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and Response Plan, the Preliminary Oil Pollution Emergency Plan – Marine Spills (both Milne Inlet and Steensby Inlet), Waste Management Plan, Waste Rock Management Plan, Hazardous Material and Hazardous Waste Management Plan, Environmental Monitoring Plan, and the Environmental Protection Plan. All regulatory and reporting requirements will be adhered to in the event of an emergency.



## **SECTION 17.0 - SURFACE WATER AND SEDIMENT QUALITY**

### **17.1 WHAT THIS SECTION IS ABOUT**

This section refers to surface water and sediment quality. It discusses the baseline conditions and the anticipated effects of the Project on fresh surface water and sediment quality.

### **17.2 WHAT WAS STUDIED**

This work is summarized below.

- Water in the Mary River area contains naturally elevated concentrations of dissolved oxygen, turbidity, aluminum, and iron. Cadmium, mercury and pH are also naturally elevated in fresh water, at levels above water quality guidelines of the Canadian Council of Ministers of the Environment.
- Analysis of the sensitivity of the receiving streams and lakes indicates that none of the streams or lakes of the freshwater receiving environment in the Project area is particularly sensitive to acidic inputs.
- Concerns expressed by communities generally focused on the potential effects on the aquatic environment of spills, pollution and contamination by the Project.

### **17.3 PREDICTED IMPACTS**

The Environmental Impact Statement considers the potential impacts of the Project on fresh water and sediment quality in lakes, rivers and streams near the Project.

- There is the potential for minor to moderate water quality effects associated with Project-related ground preparation and earthworks activities. These are only expected to occur during construction and closure phases of the Project. Potential effects are anticipated to coincide with the timing of freshet, when any potential effect is expected to be diluted by high flow conditions resulting in TSS concentrations indistinguishable from baseline.
- Only minor to moderate water quality effects are likely due to site water management. Potential effects are anticipated to coincide with the timing of freshet, when any potential effect would be expected to be diluted by high flow conditions resulting in concentrations indistinguishable from baseline.
- Minor to moderate water quality effects may be associated with Project-related laydown areas and activities. TSS loading may occasionally exceed the Canadian Council of Ministers of the Environment (CCME) threshold relative to baseline conditions. These effects are most likely to coincide with freshet conditions, which have the potential to mitigate the magnitude of the potential effect through added capacity to buffer these inputs. They are limited to summer months when construction and closure activities are scheduled.
- Minor to moderate water quality effects may be associated with explosives manufacture, explosives transportation, explosives magazine and explosives use. Ammonia, nitrates, nitrites and petroleum hydrocarbon residues originating from blasting activities in less confined locations may occasionally exceed their respective thresholds in the freshwater receiving environment. These effects would likely coincide with the snow melt when accumulated nitrogen and petroleum



hydrocarbon residues are released during the thaw and freshet conditions, which serve to mitigate the magnitude of the potential effect.

- Materials from quarries and borrows sources were found to be non-reactive based on representative geochemical testing of materials from quarries and borrows sources. Residues originating from blasting activities as well as sediment-laden water will be confined to the water management infrastructure within each quarry and borrow site.
- Rail line and road construction activities with the potential to affect surface water and sediment quality include culvert installation, bridge construction, infilling of right-of-way through watercourses (encroachment), rail bed construction, grading and water management. It is possible that total suspended sediment (TSS) loading may occasionally exceed the Canadian Council of Ministers of the Environment (CCME) threshold relative to baseline conditions. The timing of these effects is most likely to coincide with freshet conditions, when increased flows have the potential to mitigate the magnitude of the potential effect.
- Dust arising from Project activities has been addressed in the Air Quality summary. Dust generation from equipment and vehicle use and subsequent deposition in freshwater receiving bodies will result in minor to moderate adverse residual effects.
- The potential effects associated with camps include changes in water and sediment quality due to water withdrawal (described in Water Quantity – Surface Water hydrology summary), waste management, fuel storage, and discharge of sewage. It is not expected that treated water that is discharged from these activities will exceed Canadian Council of Ministers of the Environment (CCME) thresholds for contaminants.
- Activities at the airstrip including deicing and dust suppression could potentially affect waste and sediment quality. Total suspended sediment (TSS) loading may occasionally exceed the Canadian Council of Ministers of the Environment (CCME) threshold relative to baseline conditions. These exceedances would likely coincide with freshet conditions during snow melt, which is likely to dilute and mitigate any potential effects. Use of propylene glycol as a de-icing agent is anticipated to result in negligible to minor water quality effects.
- Minor exceedances from aqueous point source discharges from mine contact water areas (e.g. open pit, waste stockpiles, ore stockpiles), may occasionally occur due to extreme climatic events (such as flood conditions). These are not expected to adversely affect water and sediment quality.
- Discharge of exploration drilling effluent into Mary River required during the construction and operation phases of the Project is not expected to adversely affect water and sediment quality.
- Discharge of treated sewage effluents into fresh water will take place only at the Mine Site for all Project phases, and at Sheardown Lake and the Midrail Camp used during railway construction. They are not expected to adversely affect water and sediment quality.



#### 17.4 MONITORING AND MITIGATION

- Runoff from fuel storage and maintenance facility areas will be contained and treated as necessary to meet regulatory requirements.
- Sewage and wastewater from facilities such as camps, 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 permanent bulk explosives factories, mixing plants, explosive reagent storage facilities, and truck wash facilities will be constructed to contain any solid explosives or explosives contact water for appropriate treatment prior to discharge to the receiving environment.
- Runoff from the waste rock stockpile and from ore stockpiles will be collected in ponds, to settle out solids and treat the water as necessary to meet Metal Mining Effluent Regulations and water license requirements before releasing the water to the environment.
- Facilities and quarries will be sites at least 30 m from stream or water bodies as soon as practical to reduce the risk of potential effects of erosion and sediment transport. Similarly, water conveyance features such as culverts and bridges will be removed to restore pre-disturbance drainage patterns.
- The use of non-reactive rock for construction reduces the potential for acid generation and metals leaching that could affect surface water and sediment quality.
- Detailed rail line design, construction and operation will be completed in compliance with *Fisheries Act* Authorization requirements that are intended to protect water quality as an integral component of fish habitat.

#### 17.5 CONCLUSIONS

The proponent has concluded that with the implementation of monitoring and mitigation, the impact of the Project on surface water (i.e. freshwater) and sediment quality is not significant.



## **SECTION 18.0 - TERRESTRIAL WILDLIFE AND HABITAT**

### **18.1 WHAT THIS SECTION IS ABOUT**

This section refers to terrestrial wildlife, predominately caribou, and wildlife habitat. It discusses the baseline conditions in the Regional Study Area (RSA) and the anticipated effects on caribou as a result of the Project.

### **18.2 WHAT WAS STUDIED**

This work is summarized below.

- North Baffin Island caribou are currently in low numbers and appear to follow a cyclical pattern of approximately 70 years as identified through harvest data and Inuit Knowledge.
- Concerns raised by communities relating to caribou varied but generally focused on the Project's potential impact on caribou behaviour, movement patterns, and mortality due to Project activities. The potential for the railway to interrupt movement patterns was a main focus.
- Wolves and foxes are dominant predators in the Regional Study Area that occur in low densities.

Land mammals including caribou may be found on Figures 2.1 through 2.7 of the theme based maps generated from the Inuit Knowledge Study.

### **18.3 PREDICTED IMPACTS**

The Environmental Impact Statement considers potential effects from the Project on terrestrial wildlife and habitat.

- Habitat can be affected through direct loss within the Project footprint or through indirect loss due to Project activities that can create sensory disturbances (for example, noise or air emissions, or human presence) or reduce the effectiveness of habitats near project activities. The potential change in effectiveness of caribou habitat for the North Baffin range is predicted to be 2%.
- Usual caribou movement patterns can be altered as a result of project infrastructure, 12% of the Railway may form some kind of barrier to caribou movement. The length of sections that may pose a barrier range from 1.0 to 2.9 km, which is below a threshold of average daily caribou movement.
- Caribou mortality may occur due to collisions. Collisions if they occur will be limited to individuals and it is not expected that this will have a significant effect on the number of caribou in the region. Access to harvesting is not expected to have a significant effect on mortality since there will be no increased hunter access provided by the Project.
- A study determined that the potential for contaminants to affect caribou from the release of contaminants such as dust from Project activities was low.
- The Project is not expected to have a negative effect on wolves and foxes.

### **18.4 MONITORING AND MITIGATION**

- Traffic controls will be in place to monitor sightings of caribou and other wildlife.
- Waste will be carefully managed to prevent attraction and scavenging by wildlife.



- Seasonal stoppages for trains are possible if large groups of migratory caribou return to the area.
- Snow management will grade snow banks along railway and roadway to facilitate caribou crossing.
- The railway embankment will be constructed of fill material at five identified trails for easier caribou movement across the railway embankment.
- Train traffic will be limited to four passes per day to reduce physical barriers from trains.
- Compensation for any harvesting or habitat loss is currently being negotiated with the QIA through the Inuit Impact Benefits Agreement (IIBA).

#### 18.5 CONCLUSIONS

The proponent is moderately confident that with monitoring and mitigation measures, the Project will not have a not significant effect on caribou habitat or movement. The Project will not have a significant effect on overall north Baffin Island caribou mortality.



## **SECTION 19.0 - VEGETATION**

### **19.1 WHAT THIS SECTION IS ABOUT**

This section refers to vegetation including abundance, diversity and health and plants used by Inuit. It discusses the baseline conditions in the Regional Study Area (RSA) and the anticipated effects on vegetation as a result of the Project.

### **19.2 WHAT WAS STUDIED**

This work is summarized below.

- Plant species and abundance were identified during four summers.
- No rare or endangered plant species were identified during plant surveys within the Regional Study Area.
- Particular attention was paid to blueberries as the most often harvested vegetation that Inuit may use.
- The potential effects on vegetation due to use of land to build and operate the Project were predicted.
- The potential effects on vegetation due to emissions into the air of dust and gases were studied.
- The potential introduction of invasive species due to Project activities was estimated.

Information about berry picking is provided in Figures 1.5 and 1.6 from the Inuit Knowledge Study.

### **19.3 PREDICTED IMPACTS**

The Environmental Impact Statement considers potential effects from the Project on vegetation abundance, diversity and health.

- Vegetation can be affected through direct loss within the Project footprint or through indirect loss due to Project activities (for example air emissions) or by inadvertent introduction of invasive plant species.
- Vegetation abundance and diversity will be reduced in the Project's Potential Development Area (PDA), or footprint, where the ground will be used to build and operate the Project. The predicted loss of the terrestrial habitat within and outside the Potential Development Area (PDA) is estimated to be a very small (0.36%) portion of the Regional Study Area (RSA).
- Dust released into the area will affect an area larger than what is disturbed to build the Project. No vegetation classes sensitive to dust deposition are predicted to be adversely affected by dust outside of the Potential Development Area (PDA).
- Dust released during the Project activities will contain metals. Although accumulation of metals in the soils at the mine site and port site may occur as a result of dust deposition, the effects on caribou and vegetation (including blueberries) are not expected to have a significant adverse effect.
- Nitrogen dioxide emissions from combustion sources (i.e., power generators) outside of the Potential Development Area (PDA) will occur. No vegetation classes are predicted to be adversely affected by nitrogen dioxide emissions outside of the Potential Development Area (PDA).



- Nitrogen deposition is not predicted to exceed estimated acceptable levels outside of the Potential Development Area (PDA).
- Effects on vegetative health as a result of dust are mainly reversible when dust-producing activities end.
- The reduction in blueberry cover is expected to be minor compared to baseline conditions at the scale of the Regional Study Area (RSA). New disturbances to blueberry cover will occur along the railway and at Steensby Port.

#### 19.4 MONITORING AND MITIGATION

- Project activities will be planned and conducted to minimize the Project footprint.
- Project vehicles will stay on the established roads within the Potential Development Area during operation, limiting new disturbance.
- Revegetation of the terrestrial habitat will be allowed to occur naturally. The mitigation will reduce the likelihood of invasive plant species getting established within the RSA due to project development activities.
- Equipment brought to the Project site will be cleaned of soils that could contain plant seeds that do not naturally occur in the RSA. This will reduce the likelihood of invasive plant species getting established within the RSA due to Project development activities.
- Mitigation of dust effects on vegetation will be addressed by those measures used to mitigate effects on air quality.
- Vegetation health will be monitored during the life of the Project.

#### 19.5 CONCLUSIONS

- The proponent is highly confident that Project related activities will have a not significant effect on vegetation abundance and diversity within the Regional Study Area.
- The proponent is moderately confident that Project related activities will not have a significant effect on plant health within the Regional Study Area.
- The proponent is highly confident that Project related activities will not have a significant effect on culturally valued vegetation within the Regional Study Area.



## **SECTION 20.0 - SOCIO-ECONOMIC**

### **20.1 POPULATION AND DEMOGRAPHICS**

This part is about:

- People moving into or leaving North Baffin communities (on a more permanent basis rather than for a short time).

The Impact Statement says:

- Southern workers are not likely to move to northern communities because they are flown from locations in the south directly to the Mary River site and back, and they can still live at home. Some qallunaat may decide to stay, for example if they enter into a relationship with a community resident.
- Some Inuit from the North Baffin who have moved away may return to work at the mine. Or Inuit or qallunaat from other regions may decide to move to the North Baffin to work at the mine or for other economic opportunities related to the mine.
- Mine employees from the North Baffin may choose to move to Iqaluit or a southern community that is a point of hire since they could still continue to work at the mine.

**Baffinland's Conclusion: The number of people who would move into or out of the North Baffin will not be large enough to negatively change life in the communities.**

### **20.2 EDUCATION AND TRAINING**

This part is about:

- The opportunities for education, training and "life skill" development that the Project will bring to Inuit and incentives for youth to stay and succeed in school.

The Impact Statement says:

- All of the jobs at the mine require literacy and numeracy skills sufficient to work safely on site. There are some "entry-level" positions where on-the-job training is enough, but most of the jobs require specialized training, trade certifications or post-secondary education (see Livelihood and Employment below).
- The availability of jobs over a long period of time (at least 20 years) will likely provide youth and adults an incentive to attain higher levels of education. Some may prefer to leave school early to start work at the mine and learn on-the-job. However a minimum age of 18 is required to work at Mary River. In addition, the Company is doing several things to help Inuit gain the skills they need to be hired and to progress into better jobs over time:
  - Opportunities for people to understand what it is like to work at the mine before they start (e.g., information sessions, job-readiness training, summer experience at the mine for youth)
  - Inuit education and training coordinators to help people figure out what job they may want, what training they need, and how to get it. An Inuit elder will also be available to consult on site.

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- Mine-related training courses, such as heavy equipment operation, will be offered in communities through partnerships between the Company and other organizations like Qikiqtani Inuit Association and Kakivak. Some courses will be offered while the mine is under construction so that people have time to complete them before the mine begins operating.
- Training courses and upgrading opportunities at the site on an on-going basis.
- People who work at the mine for some time can develop skills that are useful in any job and in their lives generally, such as: self-discipline, reliability, wise money management, and the ability to make healthy choices personally and for their families. Getting hired and staying with the job long enough to learn these “life skills” is recognized as a challenge for those who need them the most. To mitigate these difficulties, the Company offers employee support and counselling. Those who make a mistake may be allowed a ‘second chance’ to come back to work, except for drug or alcohol violations. Those with a criminal record will not be automatically rejected.

**Baffinland’s Conclusion: The Project is expected to have a significant positive and long-term impact on levels of education, training and life skills in the communities.**

### 20.3 LIVELIHOOD AND EMPLOYMENT

This part is about:

- The creation of new jobs, and the employment and career paths of Inuit.

The Impact Statement says:

- Traditional harvesting has a fundamental role in livelihoods and food security. However Inuit have raised concerns about the high cost of harvesting activities and inadequate transfer of land skills and knowledge to younger generations. Without the infusion of jobs and income that the Project will bring to the region, harvesting activities will continue to decline.
- During the bulk sample phase (2007 to 2009), 265 Inuit from North Baffin communities and 212 more from Iqaluit worked at Mary River at one time or another. However turnover was high and there were cases where Inuit did not even complete the first 2-week rotation. About one in ten employees were women. In total, about two thirds of all employees hired were Inuit, and the remaining one third of workers were flown in from the south. Although, if looked at in terms of the number of hours, the situation is the reverse: Inuit worked only about one third of the total hours and workers from the south worked two thirds.
- During the construction phase between 1700 and 2700 workers will be needed and about 950 annually during the operation of the mine. Most of the jobs require at least high school and/or specialized training (e.g., equipment operators, administrative support). Jobs such as drillers, train operators, supervisors and managers require advanced training, accreditation or college/university education. Training for jobs such as labourers, kitchen helpers, and cleaners is usually provided on-the-job; this type of job accounts for about 25% of the jobs available during operation.



- It is hard to predict, but it is estimated that there will be roughly 300 full-time equivalent positions that Inuit can fill given current skill levels in the region. It is also expected that the turnover will be high initially as Inuit try out work at the mine and the fly-in fly-out lifestyle.
- Although some Inuit may only want to work casually at the mine, the Company supports job retention and career advancement for Inuit employees through several initiatives outlined in an Inuit Human Resources Strategy; for example: opportunities to gain skills (see Education and Training above), career counselling, and Inuit preference in hiring and promotion decisions. Special efforts will be made to encourage youth and women to work at the mine.
- After the mine closes, long-time employees and those dependent on the income from mine work will experience disruption. However, there will be skills transferable to other jobs, and mine workers will have had training and support in career planning and financial planning.
- It is expected that many indirect jobs will be created in Nunavut due to the economic stimulation that the Project brings to the territory. Such jobs will benefit Inuit in the North Baffin and Iqaluit to the extent that they have the skills and ability to fill them.

#### **Diversity of Jobs at a “Typical” Operating Iron Mine Project**

<i>Area</i>	<i>Sub-Area</i>	<i>Job Titles, Trades, Certifications, Experience</i>	<i>Skill Level B+ (University, Journeyman Trades, Managers)</i>	<i>Skill Level C (Secondary school and/or occupation-specific training)</i>	<i>Skill Level D (Labourers, helpers, on-the-job training)</i>
			<i>(estimated percentage of positions)</i>		
Site Services, Logistics	Medical Clinic & Emergency Response	Nurse, Paramedic, EMT, Firefighter	30%	50%	20%
	Travel & Accommodations	Hotel Management, Logistics	30%	50%	20%
	Catering & Housekeeping	Chef, Cook, Baker, Hotel/Restaurant Management	30%	20%	50%
	Site Services Operators	Heavy Equipment Operator, Water Treatment Plant, Sewage Treatment Plant	20%	40%	40%
	Security	Security Guard	20%	30%	50%
	Procurement & Warehousing	Procurement, Warehousing, logistics, Buyers	20%	40%	40%
	Power Plant	Power Engineer	70%	20%	10%

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<i>Area</i>	<i>Sub-Area</i>	<i>Job Titles, Trades, Certifications, Experience</i>	<i>Skill Level B+ (University, Journeyman Trades, Managers)</i>	<i>Skill Level C (Secondary school and/or occupation-specific training)</i>	<i>Skill Level D (Labourers, helpers, on-the-job training)</i>
			<i>(estimated percentage of positions)</i>		
	Operation				
	Supervision & Management	Supervisors, Managers, Administrative Assistants	40%	40%	20%
	Sewage & Water Treatment Operator	Water, Wastewater, Solid Waste Management - Water Testing	30%	30%	40%
Mine	Geology	Mine planners, geologists	40%	40%	20%
	Supervision & Management	Supervisors, Managers, Administrative Assistants, Dispatch Operators	40%	40%	20%
	Laboratory	Chemist, Sample Prep Technician, Geological Technician	20%	20%	60%
	Blasting	Explosives Plant, Blaster, Blaster Helper	20%	30%	50%
	Engineering	Mining/Civil Engineer, Surveyor, CADD Operator, Document Control	40%	40%	20%
	Heavy Equipment Operator	Drill, Excavator, Haul Truck, Dozer, Grader, Front End Loader, Shovel, Mine Helper	20%	30%	50%
	Crushing, Screening	Crusher Plant Operator, Process Helper	20%	30%	50%
	Stockpile Management	Dozer, Front End Loader	10%	40%	50%
Rail & Port Operations	Track Maintenance	Trackmen, Welder, Maintenance of Way Operator	10%	60%	30%
	Train Operations	Locomotive Operator, Dispatch Operators	30%	60%	10%

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Area	Sub-Area	Job Titles, Trades, Certifications, Experience	Skill Level B+  (University, Journeyman Trades, Managers)	Skill Level C  (Secondary school and/or occupation-specific training)	Skill Level D  (Labourers, helpers, on-the-job training)
			<i>(estimated percentage of positions)</i>		
	Supervision & Management	Supervisors, Managers, Administrative Assistants	40%	40%	20%
	Port Operations	Shiploader Operator, Tertiary Crushing Plant Operator, Screening Plant Operator	20%	30%	50%
	Stockpile Management	Dozer, Front End Loader, Port Helper	10%	20%	70%
Maintenance	Fixed Plant Equipment	Electricians, Millwrights, Carpenters, Instrumentation, Welders, Apprentices	70%	20%	10%
	Mobile Equipment	Heavy Duty Mechanics, Automotive Mechanics, Locomotive Mechanics, Welders, Apprentices	70%	20%	10%
	Supervision & Management	Supervisors, Managers, Administrative Assistants, Maintenance Planners	40%	40%	20%
	General Maintenance	Fuel/Lube Truck Operators, Maintenance Assistants	10%	20%	70%
Support Services	Finance & Information Technology	Accountants, Accounting Technicians, IT Technicians	50%	30%	20%
	Human Resources & Training	Human Resources, Payroll, IIBA Coordinators, Elders, Trainers, Recruitment, HR Analysts.	40%	30%	30%
	Environment, Health, Safety & Sustainability	Liaison Officers, Environmental Technicians, Safety Officers	20%	40%	40%
	Exploration	Geologists, Geophysicists, Geological Technicians, Drillers	30%	30%	40%

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- Complete job descriptions, qualification requirements, and terms and conditions of employment will be available for job seekers on request. All job vacancies will be posted on Baffinland's website. Bulletins on job vacancies will be maintained in the offices of the Baffinland Liaison Officers. It will be the responsibility of the Baffinland Liaison Officers to inform community leaders and the community at large of upcoming job vacancies. Bulletins on job vacancies will also be passed on to Baffinland's office based in Iqaluit. Job vacancies, qualification requirements, and terms and conditions of employment will be published in the local media (newspaper, radio, television). Many of the skill sets required for operation of the mine (professional, technical, trades) will not be available in Nunavut. For those positions, Baffinland will advertise in the national media or retain the services of a recruitment agency. All job applications will be received by the HR Department.

**Baffinland's Conclusion: The Project will have no significant negative effects on livelihoods and employment. With successful implementation of proposed mitigation measures, there will be a significant positive effect on available jobs and career advancement for Inuit in North Baffin communities and Iqaluit.**

#### 20.4 HUMAN HEALTH AND WELL-BEING

This part is about:

- The well-being of families (especially children), issues around substance abuse, and the overall health of communities.

The Impact Statement says:

- Both positive and negative effects can result from the income generated by working at the mine. In most cases it is expected that income will be used to provide nutritious food (country food or store-bought) and needed supplies, and to improve living conditions and wealth. It is acknowledged, however, that in some cases the money may be spent unwisely, for example on drugs and alcohol. An increase in the flow of drugs and alcohol into the communities is a particular concern since there are negative implications for all residents. Children are especially vulnerable and the consequences can be severe and long-lasting.
- Adapting to rotational work will require a period of adjustment for employees and their families. Negative effects could include loneliness and jealousy from separation and additional stress on those responsible for domestic chores and childcare at home. Periodic absences of one family member can also cause household disruptions, inconsistent parenting, and emotional cycles.
- Time on site away from the community may have positive effects for some mine workers if it removes them from unhealthy home environments or tendencies toward substance abuse.



- Reactions and the ability to adapt to working at the mine will vary depending on the individual and the situation in each family. It is also difficult to predict the extent to which positive or negative effects will permeate or change community life. The Company will do several things to support employees, families and communities:
  - Support for employees and their families will include: a strict no alcohol or drug policy on site (including baggage searches for substances); orientation and training programs that discuss health and safety, stress management, adjustment to rotational work schedules, addiction issues, and financial planning; and counselling services on site with an Inuit elder available for consultation.
  - Through the Inuit Impact and Benefit Agreement (IIBA) negotiations, the Company and Qikiqtani Inuit Association have agreed to create and equally contribute to a community support fund (called the Ilagiiktunut Nunalinnullu Pivalliajutisait Kiinaujat fund, to be administered by the Qikiqtani Inuit Association). Communities can draw on this fund to build community capacity, ensure fair distribution of benefits, and deal with any negative effects that arise from the Project despite implemented mitigation measures. For example, the fund could sponsor activities such as youth-elder programs, cultural and harvesting activities, educational incentives, social support organizations and healing programs.
  - In addition, it is assumed that revenues paid by the Company to the Government of Nunavut (GN) and Qikiqtani Inuit Association will be reinvested in ways that support community needs, development and adaptation.
  - The Company will monitor the effects on employees and their families, and the performance of mitigation and management plans. In addition, the Company will support the efforts of a regional Socio-economic Monitoring Committee (Q-SEMC) and perhaps others to monitor effects in communities. Monitoring should ensure timely interventions and continued improvement in Project management and the relationship between the Company and Inuit.

**Baffinland's Conclusion: Mitigation measures and monitoring will minimize any potential negative impacts and have an overall positive effect. The health and well-being of mine employees and their families will be significantly improved. There may be some negative effects from substance abuse initially but as employees adjust to the demands of work at the mine and make use of education programs and counselling available to them, there will likely be a positive shift in attitudes toward healthy lifestyle choices. The periodic absence of mine employees from the community is not expected to affect life in the community generally.**

## 20.5 ECONOMIC DEVELOPMENT AND SELF-RELIANCE

This part is about:

- The contributions that the Project can make to identified community and regional economic development objectives, while it is operational and after it closes.



The Impact Statement says:

- Any negative effects to the land or to harvesting from the Project will be minimized. There may also be positive effects on harvesting if mine employees use some of their income to go out on the land, to support other hunters, or to purchase country food. However the overall impact is uncertain.
- Project activities (e.g., shipping) will disrupt the “wilderness experience” that tourists come to see. Since the industry is small, the Company believes that the frequency of interactions with tourists will be low and therefore the impact will not be significant.
- The Project increases long-term job and training opportunities, especially for youth.
- The overall wealth in North Baffin communities and Iqaluit is expected to increase through employment wages, local procurement and business contracts. This benefit depends on the ability of communities to take advantage of opportunities.
- There may be some loss to local organizations and businesses if key people go to work at the mine or leave the community, but this is expected to be small. Further, the Company (with partner organizations) will implement initiatives to help develop the capacity and skill levels of businesses and the labour force. A community support fund, co-sponsored by the Company and Qikiqtani Inuit Association, also may be used toward developing capacity.
- Together with the many indirect jobs and general economic growth and diversification, the Project will have a large effect on the entire territorial economy.
- Substantial revenues will be paid to Inuit (through the Inuit Impact Benefit Agreement (IIBA)) so that Inuit in the Baffin region may benefit. Money will also be paid to the government in royalties, fees and taxes. If these funds are reinvested in infrastructure, housing, health care and education, the Project will indirectly improve the basic needs of Inuit living in the communities.

**Baffinland’s Conclusion: Overall the Project will have a positive impact on the economic development and self-reliance of the North Baffin and of Nunavut as a whole.**

## 20.6 COMMUNITY INFRASTRUCTURE AND PUBLIC SERVICES

This part is about:

- The effects that the Project may have on community services.

The Impact Statement says:

- The Project will create competition for skilled workers. This may pose a short term problem for the Hamlets. For example, there may be some reductions in services, such as longer wait times for water delivery, but Hamlets will be able to deal with it. Soon, however, the effect of the training programs being offered by the Project will increase the skilled labour force overall which will benefit the Hamlets.
- Increased revenues flowing to the Government of Nunavut will provide for more ability to invest in community infrastructure and improved services. Also the various training and employee and



family support activities that the Company will offer can be combined with existing Government of Nunavut services with the result of improving services available in the communities.

- The Company and Qikiqtani Inuit Association will contribute every year to a community support fund that will be created through the Inuit Impact Benefit Agreement (IIBA). This fund can be combined with existing Government of Nunavut programs which will increase funding available to support communities, families and individuals.
- The Milne Inlet Tote Road could be left operational after the Project closes as long the landowners (mainly the Qikiqtani Inuit Association) take over maintenance responsibilities. If not, then the bridges and culverts will be removed and the area returned to pre-Project conditions.

**Baffinland's Conclusion: Overall any negative impacts on availability of workers and community services will be short term as Project-initiated training leads to improved level of skill and experience in the Inuit labour force.**

## 20.7 CONTRACTING AND BUSINESS OPPORTUNITIES

This part is about:

- Opportunities for business and contracts, and what can be done to help Inuit companies.

The Impact Statement says:

- The Project will create opportunities for local businesses to expand. Between 2006 and 2010 there was \$10 million of goods and services purchased from North Baffin businesses and \$39.9 from Iqaluit.
- There are no other significant development projects in the foreseeable future for the North Baffin region.
- The capacity of local businesses to get Project contracts is low right now. The Company will implement programs to support local business development.
- Increased income in the communities will result in new purchasing power. Where that money is spent will be up individuals and families. However local businesses could capture this new disposable income.
- Local businesses that are developed only to service the Project will need to expand their client base to survive after the Project closes.
- The successful implementation of the support measures to be provided by the Company, and the active participation of individuals in the programs will determine the degree to which businesses will benefit.

**Baffinland's Conclusion: The Project will have a significant positive effect on the level of opportunities available for business and contracting.**



## 20.8 RESOURCES AND LAND USE

This part is about:

- The potential effects of the Project on Inuit harvesting, land use and quality of country foods. It is also about traditional patterns of sharing food and by-products from the hunt and a general sense of well-being in areas where there is the most Project activity.

The Impact Statement says:

- The caribou assessment studies conclude that there will not be a noticeable change to the abundance and distribution of caribou therefore harvesting is not expected to be significantly affected either in terms of quantity or effort needed.
- The risk for collisions along the railway with caribou is minor. If this does occur, meat will be salvaged and given to Inuit workers at the camps.
- Based on all the studies done on marine mammals, it is predicted that the Project will have a minor effect on marine mammal harvesting.
- Narwhal may be disturbed in certain areas, at certain times of the year (Milne Inlet for example) and this may affect harvesting. However other harvesting areas are still available.
- The effects of year round shipping on beluga and walrus in Foxe Basin for Igloolik and Hall Beach are not expected to be significant because most harvesting occurs close to the community and west of Rowley Island. Ship disturbance is distant from these areas.
- Disturbance of narwhal and beluga from shipping in Hudson Strait is predicted to be low to medium. However Kimmirut and Cape Dorset harvesting zones are along the shore and the floe edge and far away from shipping so harvesting is not expected to be affected.
- There may be some mortality of ringed seals from shipping but this will not have any effect on ringed seal populations. There may be more disturbances in Steensby Inlet, but since this is not the main location for harvesting, it is considered negligible.
- Harvesting of fish appears to be a secondary activity while Inuit are out on the land hunting for larger game or traveling. The Project will have a negligible effect on fish harvesting.
- Inuit workers will not be permitted to harvest on Project sites. Other Inuit can but only to the extent that public safety is not an issue.
- The Company will undertake a monitoring program and if there are effects, the Inuit Impact Benefit Agreement (IIBA) will provide for compensation.
- Shipping in Milne Inlet is not expected to meaningfully affect use of open water by hunters but hunters will see the ships. Since Inuit travel generally occurs close to shore, no direct interaction is likely. Information on shipping will be communicated for public safety reasons.
- The Port sites themselves will be off limits. All Project sites are industrial sites and Inuit passing through will be encouraged to check in at the main office to make their presence known. Camping and traveling elsewhere can continue without limitation however it is implied that the quality of camping areas close to Project facilities will be different (noise, dust).

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- Travel through the mine area and the Milne Inlet Tote Road will be restricted. Check-ins will be encouraged.
- 6 crossing areas along the railway for ATVs and snowmobiles will be constructed at locations to be determined in consultation with the communities.
- Direct travel on land fast ice across Steensby Inlet will no longer be possible once shipping begins.
- The presence of the Port sites will provide a safe place for Inuit traveling in the area. The Company will be able to assist travelers in the immediate area in the event of an emergency.

**Baffinland's Conclusion: The Project will not have a significant effect on harvesting or the quantity or quality of country food. Travelling will not be significantly altered by the mine infrastructure. There will be some local effects at specific sites such as the Ports, road and railway.**

#### 20.8.1 Travel

This part is about:

- Community concerns regarding railway crossings, travel routing around ship tracks, and hunter safety, especially in inclement weather.

The Impact Statement says:

- Several travel routes cross the proposed railway. Most of which are used by snowmobiles, but some all-terrain vehicle (ATV). Snowmobile crossings will be possible at most but not all locations during snow cover. The railway corridor could cause hunters to detour to find a suitable crossing. There is also a safety hazard and the potential for damage when crossing the rail line. To ensure safe crossing several mitigation measures have been identified in the Railway Management Plan (Appendix 10D-9). These measures include:
  - Public education based upon the "Operation Lifesaver" program that will be adapted to Nunavut's specific needs.
  - Six locations for safe crossing, in addition to the Ravn River, which can be used in the winter as a safe crossing.
  - To ensure safety, the proposed "snowmobile crossings" at six strategic locations will consist of signage, a surface treatment of finer filled material over the embankments, and wooden timbers next to the steel rails, to prevent ATVs and snowmobiles from getting caught. The location of these crossings will be finalized after consultation with the communities. Discussions of safety aspects in relation to the railway, crossing it, and travel in inclement weather will be included in these consultations.
- Steensby Port is an area actively used for travel across the Inlet by water and landfast ice. The inlet is a part of a main travel route for residents from Clyde River travelling to Igloolik and for residents from Igloolik and Hall Beach who travel inland. As a result of Project development, direct travel on landfast ice across Steensby Inlet will no longer be possible unless future mitigation measures are developed. Land-use activities will still be possible; however, a detour

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around the ship's track will be required. To address safe travel across the Steensby Inlet, one mitigation measure proposed is set reflective markers in the ice to identify the ships track and mark out the safest route. Baffinland will explore with the QIA and communities the most optimum measure for crossing the ship track. These discussions will include the identification of issues that may be specifically related to traveling in inclement weather.

- No shipping will occur out of Milne Port during the ice season, thus there will be no interactions with travellers. Project-related shipping through Pond Inlet to Milne Inlet is not expected to meaningfully affect use of the open water by hunters in boats, although vessel sightings will occur. Although the ships will not have an effect on people's ability to travel, public safety interactions will exist, but will be mitigated by community public safety awareness campaigns, informing the community of vessel movements, tracking the route and timing of passage, and by periodic public meetings and information sessions. These information sessions will provide opportunities to discuss issues related to travel safety.
- Baffinland acknowledges that shipping, port activities and rail line operations related to the Project may cause socio-economic effects, for example by potentially affecting Inuit travel. Mitigation measures the Company will undertake to offset the inconvenience or hardship created by such changes include:
  - Providing fuel to offset the additional costs for traveling around the Steensby Port site and associated shipping route.
  - Providing food and shelter at Project facilities.
- The potential for additional mitigation response, agree to through processes that may be defined through the IIBA is also acknowledged.

**Baffinland's Conclusion: The project will interact with current travel patterns; however, with planned mitigation measures, effects are not assessed as being significant. Individuals' ability to travel and camp throughout the land use study area will not be meaningfully altered—the negative effects are only evident at points of project interaction including Milne Inlet, Milne Inlet Tote Road, Mine Site, Railway, and Steensby Port.**

## 20.9 CULTURAL WELL-BEING

This part is about:

- How the Project may change how Inuit feel about themselves and their communities and if

Inuit will feel welcome and comfortable working at the Project.

The Impact Statement says:

- The cultural well-being of Inuit is an Inuit activity and responsibility. The Company will not be paternalistic or take on the main role in preserving Inuit well-being. Instead it will support the Inuit and QIA to do this.
- The message from Inuit during the public consultations and working groups is the desire to preserve traditional lifestyles and land use activities and the need for economic development.



- Elders have consistently indicated a strong desire for economic development as the future for their youth. Harvesting and other traditional activities require money to maintain.
- Employment may help individuals become more self-sufficient and independent. Life skills learned from employment will enable individuals to take greater pride and control in their lives. This can be translated to greater personal confidence and increased opportunities to pursue cultural activities.
- Change is already occurring in the communities, including the loss of language and culture. This is seen by youth's increased interest in modern technology and media and decreasing preference for participating in Inuit cultural activities. Consumption of store bought food is also increasing.
- Education has shifted toward the need for academic knowledge rather than traditional knowledge.
- The Company will provide inspected country food at the work place. Use of Inuktitut, will be encouraged.

**Baffinland's Conclusion: The project will fit in with the pre-existing cultural changes occurring in the affected communities, most notably by providing employment to younger generations. Inuit who wish to work will have that opportunity. Due to the distance away from the communities the**

**Project will not affect the daily routine of Inuit or their local cultural pursuits.**

#### 20.10 BENEFITS, ROYALTY AND TAXATION

This part is about:

- How benefits, royalties and taxes from the Project flow to Inuit organizations and governments.

The Impact Statement says:

The annual budget for the Government of Nunavut is currently \$1.2 billion. Almost all of this comes from Federal transfers. Debt load is low, however projections are that the Government will need to increase spending in the in the areas of public health and social services. Forecasted revenues from mining will assist.

- The Mary River Project will generate streams of revenue to the federal and territorial government. These payments include taxes on inputs of labour and materials and taxes on corporate profits. In addition, Baffinland will pay for the iron ore that it extracts from the land. These "resource royalties" will be paid to the federal government. Under the negotiated terms of the Nunavut Land Claims Agreement, Inuit own the subsurface mineral rights of relevance to this Project. As a consequence, these payments made by Baffinland will be transferred by the federal government to NTI, as set out in the NLCA. This is discussed further in Section 12.4.1, below. The following table provides a summary of these various payments.



### **Baffinland Required Payments Of Benefits, Royalty, And Taxes**

Type of Payment	Federal Government	Territorial Government	Other Governments	Inuit
Negotiated Benefits				
IIBA				✓
Royalty				
Nunavut mining royalty	✓	→transferred→		✓
Taxes				
Corporate Income Tax	✓	✓	✓	
Employee payroll tax		✓		
Fuel tax		✓		
Property tax		✓		
Other taxes and payments (CPP, WSCC)	✓	✓	✓	

**Notes:**

1. The employee payroll tax is a 2% tax on wages paid that is deducted from workers' paycheques. Nunavut residents get this deduction rebated while southern employees do not. Since Baffinland and its contractors need to establish competitive wage scales to attract the workforce this is essentially a tax that Baffinland needs to pay.

2. Other taxes include the employer's contribution to the Canada Pension Plan (CPP), contributions to the Workplace Safety and Compensation Commission (WSCC).

- NTI as the owner of sub-surface rights will be paid royalties. As with corporate profits tax payments, this amount is expected to vary according to Project profitability which in turn will be influenced by variables such as currency exchange rates, iron ore prices, and fuel costs.
- There will also be an Inuit Impact Benefit Agreement (IIBA) with Qikiqtani Inuit Agreement which may include cash payments.
- The Company will also contribute funding to capacity building and long-term social development through the joint Qikiqtani Inuit Agreement/Company Ilagiiktunut Nunalinnullu Pivalliajutisait Kiinaujat Fund.
- There will also be some tax revenue to both the Government of Nunavut and Federal Government through personal income tax from Inuit working at the mine. This will depend on how many local residents work and their patterns of employment.
- Governments could choose to use some of this additional revenue to support new investments in the communities such as in the areas of education and infrastructure.

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**Baffinland's Conclusion: The Project will provide new revenues to Governments and Inuit organizations which could allow for new spending. This is considered a significant beneficial effect.**

#### 20.11 GOVERNMENT AND LEADERSHIP

This part is about:

- How the Project complements the existing strategic priorities of government, Inuit organizations and communities.

The Impact Statement says:

- The Project fits into the Government of Nunavut and local community economic development strategies, particularly regarding the need to build local capacity and create employment and business opportunities.
- The IIBA to be completed before the Project can proceed will set out a process for supervising and governing events throughout the Project.
- The Company is open to considering another level of oversight – a Development Partnership Agreement with the Government of Nunavut. A Development Partnership Agreement could provide an effective way of carrying out responsibilities for commitments made regarding the Project.
- The monitoring programs that the Company will establish and implement will also contribute to providing data and sharing in the responsibility for making positive adjustments to activities throughout the Project.

#### 20.12 CUMULATIVE EFFECTS ASSESSMENT

The Final Environmental Impact Statement also considers potential effects of the Project in interaction with existing or possible future activities and projects in the region and beyond. Examples of other activities and projects include: further development of Mary River (deposits No.2 and No.9), other exploration and mines (such as Roche Bay), the Separation Lake hydroelectric project, and the Nanisivik Naval Facility.

The effects of all activities and projects together on the region and over time are called “cumulative effects.” Effects that extend to other regions, for example the rest of Canada are called “transboundary effects.”

From the socio-economic perspective, only potentially negative cumulative or transboundary effects are considered in the analysis. These are: migration into and out of the Baffin region, substance abuse, competition for skilled workers, and effects to archaeological sites and to land and marine use.

The Cumulative Effects Assessment says:

##### In-migration and out-migration

- With additional jobs available from other projects in the region, more southerners and Inuit might come for work and some of these may decide to stay on more permanently. However, it is likely that they will stay in the larger centres.

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- Inuit, having gained skills from training programs and working at Mary River, may decide to leave the region in order to work on other projects or to take advantage of opportunities such as better services, schools and recreation in other locations. This ability to choose is considered a positive effect. Negative effects could be experienced if too many skilled people leave the North Baffin or any one community, but the number of Inuit who would choose to leave and the number that would begin to adversely affect the function of a community or the region is uncertain.
- The number of Inuit that may move south, to Ottawa for example, is not expected to have an effect on the population of those cities.

**Baffinland's Conclusion: Any negative cumulative effects due to migration into the North Baffin will be minimal. The effect on communities of out-migration of Inuit is uncertain and no significant negative cumulative effect is assessed. The effect on southern communities from Inuit moving to these locations is expected to be negligible.**

#### Substance Abuse

- More projects and people coming into the region in the future could have a negative effect on substance abuse since there is more money generally to be spent on drugs and alcohol and there are more ways in which these substances can find their way into communities.
- Strict policies are in place on the Mary River site to prevent alcohol and drugs on site and their transport through the site to communities. It is possible that future projects unrelated to Mary River may not adhere to the same high level of restriction of substances, though this is not considered likely given the recognized risks to safety and liability that drugs and alcohol pose to any site.

**Baffinland's Conclusion: The effect that future projects may have on substance abuse is uncertain but the interaction with Mary River to result in cumulative effects is considered to be limited.**

#### Competition for Skilled Workers

- If other projects in the region go forward, it is possible that they will draw even more skilled workers away from communities, potentially causing disruption in municipal services and reduced capacity in local businesses and organizations. However local employment is perceived as preferable by many Inuit and other projects may not be hiring directly from the same communities as the Mary River project. Also, with training initiatives, the number of skilled workers available over time is expected to increase.

**Baffinland's Conclusion: No significant negative cumulative effect on competition for skilled workers is anticipated.**

#### Future Cumulative Effects Assessments

In the future, if the Mary River Project proceeds, other proposed projects and activities will have to undergo an environmental assessment that includes the potential for cumulative effects with the Mary River Project. At such time, these potential cumulative effects would be reviewed by regulatory agencies and any significant effects would be mitigated.



## SECTION 21.0 - MANAGEMENT PLAN SUMMARIES

VEC's	Issues/Concerns	Environmental Monitoring and Mitigation Plan
Landforms	Glacier Features (Ground Ice)	Environmental Design Guidelines Surface Water Management Plan
	Unique Landform	
	Permafrost and Soils	
Archaeological Sites	Disturbance of archaeological sites	Environmental Design Guidelines Cultural and Heritage Resource Protection Plan
	Removal of artefacts	Environmental Protection Plan Cultural and Heritage Resource Protection Plan
Paleontological Sites	Disturbance of paleontological sites	Environmental Design Guidelines Cultural and Heritage Resource Protection Plan
	Removal of fossils	Environmental Protection Plan Cultural and Heritage Resource Protection Plan
Air Quality	Dust from: Land disturbance and roads Quarries and borrow pits Mining operation and waste rock stockpile Material handling (crushing plant, conveyors, stackers, stockpile, and ship loading)	Environmental Design Guidelines Environmental Protection Plan Air Quality and Noise Abatement Management Plan
	Emissions from: Mobile equipment Power plant Waste incinerator Ship	
	Carbon balance and greenhouse	Environmental Design Guidelines

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VEC's	Issues/Concerns	Environmental Monitoring and Mitigation Plan
	gas emissions	
Noise and Vibrations	Blasting (construction, open-pit mine, quarries)	Environmental Design Guidelines
	General construction activities	Environmental Protection Plan
	Crushing operation	Air Quality and Noise Abatement Management Plan
	Traffic (rail, road, ship, aircraft)	
Water Quality	Site runoff from: Site preparation Ore stockpiles Waste rock stockpile Crushing plant, maintenance area and other facilities Roads and laydown areas Port facilities Maintenance yards	Environmental Design Guidelines Environmental Protection Plan Wastewater Management Plan Surface Water, Aquatic Ecosystems, Fish and Fish Habitat Management Plan Waste Management Plan Waste Rock Management Plan Explosives Management Plan
	Mine pit water (ammonia, nitrates, dust from blasting)	Surface Water, Aquatic Ecosystems, Fish and Fish Habitat Plan Waste Rock Management Plan
	Sewage treatment plants – water discharge quality	Wastewater Management Plan
	Rail ballast and cut/fill contributions to water courses along rail routes and roads	Environmental Design Guidelines Environmental Protection Plan
	Run off plume from Steensby Inlet ore stock pile	Surface Water, Aquatic Ecosystems, Fish and Fish Habitat Management Plan
	Ballast water discharge	Shipping Management Plan
Water Quantity	Lake drawdown effects – camps and drilling	Environmental Design Guidelines
	Channel and ecosystem stability	Environmental Protection Plan

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VEC's		Issues/Concerns	Environmental Monitoring and Mitigation Plan
		post-water diversions	Surface Water, Aquatic Ecosystems, Fish and Fish Habitat Management Plan
		Ice damming	
		Volume reduction	Road Management Plan
Fish Habitat		Habitat loss or alteration for: Site facilities Road creek/stream/river crossings Railway creek/river crossings	Environmental Design Guidelines Environmental Protection Plan Surface Water, Aquatic Ecosystems, Fish and Fish Habitat Management Plan Road Management Plan Fish Habitat No Net Loss Plan
Fish	Arctic Char	Change in fish health, habitat, and population	Environmental Design Guidelines Environmental Protection Plan
		Water quality changes	Surface Water, Aquatic Ecosystems, Fish and Fish Habitat Management Plan
		Discharge and intake structures	
		Blasting	Road Management Plan
		Metal accumulation and taste (consumptive)	Fish Habitat No Net Loss Plan
		Increased fishing pressure	Environmental Protection Plan
Vegetation	Berries Plants important for wildlife	Destruction of rare species and Species At Risk	Environmental Design Guidelines Environmental Protection Plan Terrestrial Environment Management Plan
		Surface disturbance (temporary or permanent loss of vegetation)	
		Airborne dust effects on abundance and diversity	
		Metal uptake and resultant effects on other VECs	
		Alien invasive species	
Birds	Loons Common Eider	Destruction of nests during construction	Environmental Design Guidelines Environmental Protection Plan
		Disturbance of nesting and habitat	Terrestrial Environment

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VEC's		Issues/Concerns	Environmental Monitoring and Mitigation Plan
	Songbirds Snowy Owl	Disturbance of nests and habitat in transportation corridors and Sheardown Lake	Management Plan
		Interruption of food chain (songbirds)	
		Aircraft Collisions at Steensby Port	
	Peregrine Falcon	Destruction of nests during construction (gyrfalcon nest along Cockburn Lake rail cut)	Environmental Design Guidelines Environmental Protection Plan Terrestrial Environment Management Plan
		Disturbance of nesting and habitat (mining activist, overflights)	
		Interruption of food chain (songbirds)	
	Sea Birds	Ross' gull (Species at Risk) Potential wake effect from ships Disturbance to feeding from open-water ship traffic	Environmental Design Guidelines Environmental Protection Plan Terrestrial Environment Management Plan
	Snow Geese	Disruption of moulting and staging habitat (different locations and timing) – when birds are vulnerable due to nutritional stress	Environmental Design Guidelines Environmental Protection Plan Terrestrial Environment Management Plan
		Aircraft collisions at Steensby Port	
Terrestrial Wildlife	Caribou	Disturbance and destruction of habitat	Environmental Design Guidelines Environmental Protection Plan Road Management Plan Railway Maintenance Management Plan
		Interruption of migratory process and routes by rail, road, ship track, and camps	
		Unsafe passage across/through project infrastructure	
		Change in abundance/distribution in Regional Study Area	
		Interruption of hunting/increased hunting due to increased	Environmental Design Guidelines

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VEC's		Issues/Concerns	Environmental Monitoring and Mitigation Plan
		familiarity/knowledge of the area	Environmental Protection Plan
		Integrating/obtaining IQ knowledge	
		Overhead flights disturbance	
	Carnivores	Disturbance of den habitat	
		Habituation and feeding	
Marine Mammals	All Mammals	Ice breaking through sea ice along the route	Shipping Management Plan
		Collisions with ships (open water and pack ice)	
		Habitat loss due to project facilities footprint (docks, blasting/dredging)	Environmental Design Guidelines
		Habitat alteration within the water column or seabed	Environmental Protection Plan
		Oil spill impacts	Emergency Response Plan and Spill Contingency Plan
	Shipping Management Plan		
	Wastewater Management Plan		
	Polar Bear	Human-bear interactions	Surface Water, Aquatic Ecosystems, Fish and Fish Habitat Management Plan
	Beluga Whale	Ability to acclimatize to disturbance	Environmental Design Guidelines
	Narwhal Whale	Disturbance to important summering habitat in Milne Inlet	Environmental Protection Plan
	Bowhead Whale	Ability to acclimatize to disturbance	Shipping and Marine Wildlife Management Plan
	Walrus	Ability to acclimatize to disturbance	
	Bearded Seal	Ability to acclimatize to disturbance	

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VEC's		Issues/Concerns	Environmental Monitoring and Mitigation Plan
	Ringed Seal	Increase in seal pup mortality	
Socio Economic		Alcohol and drug use	Socio Economic Environment Management Plan Stakeholder Engagement Plan Human Resources Plan
		Inuit preparedness for the workplace	
		No hunting – no fishing	
		Points of hire	
Mine Closure		Long-term monitoring and maintenance post-closure	Preliminary Mine Closure Management Plan
		Revegetation and reclamation plans	
Note: For details and justification of mitigation measures incorporated in the Project, see EIS Volume 4 through Volume 8.			

## **Appendix 10A - Baffinland's Environmental, Health and Safety (EHS) Management Framework**

The Baffinland Environmental, Health, and Safety (EHS) Management System Framework describes the requirements to develop and maintain the elements of a management system in a manner relevant to regulatory requirements, health, and safety risks associated with the Mary River Project, and the Project's environmental impacts. The document facilitates implementation of the EHS Management System by describing the minimum requirements that must be met.

The Manager for Sustainability is responsible for implementing Baffinland's EHS policies and environmental management plans, and for ensuring that the EPCM contractor and subcontractor have the organization, policies, and operating practices in place to ensure ongoing compliance with Baffinland's Environment, Health, and Safety requirements.

### **Appendix 10A-1 - EHS Framework Standard**

Baffinland's EHS Management Framework Standard defines the sequence of policy, planning, implementation and operation, checking and corrective actions, and, management review processes that must be established to ensure that the Mary River Project is executed in an environmentally acceptable manner and in a spirit of continuous improvement.

### **Appendix 10A-2 - Hazard Identification and Risk Assessment Procedure**

This Standard is a practical guide for advancing environmental protection, and to make Baffinland workplaces safe for employees, contractors, and visitors. It will help both management and employees, through consultation, comply with environment, health, and safety regulations. These regulations require



employees to identify, assess, address, and record all hazards and risks in their workplace and surrounding environment.

### **Appendix 10A-3 - Construction Risk Management Report**

As part of Baffinland Iron Mines Corporation's Mary River Iron Ore Project, a risk management assessment of the project was conducted. The risk assessment involved a qualitative review of risks associated with technical performance (only when influenced by design), project cost, project schedule, health and safety, reputation, legal/regulatory and environmental.

The focus of the risk assessment was on higher level risks representing threats to the success of the project. Opportunities were also captured. The scope included project execution risks only, excluding environmental permitting. Additionally, operational risks that could be caused or mitigated by design were also included in the scope. The risk ranking according to probability of occurrence and impact was done at a pre-mitigation level. Mitigation actions were also identified for each risk; however, a post-mitigation ranking was not included as part of the scope.

### **Appendix 3B, Attachment 5 – Environmental Protection Plan (EPP)**

The EPP provides a practical way to facilitate field implementation of environmental regulations, practices, and procedures required to eliminate or reduce potential environmental effects. It is a working document for use in the workplace for project personnel and contractors, as well as at the corporate level for ensuring commitments made in policy statements are implemented and monitored.

### **Appendix 3B, Attachment 5 - Emergency Response and Spill Contingency Plans**

#### **Appendix 3B, Attachment 5 - Emergency Response and Spill Contingency Plan**

This Emergency and Spill Response Plan (ERP) identifies potential emergencies that could arise during construction and operation of its mine at Mary River and establishes the framework for responding to these situations. Because the ERP was prepared during the Project planning stage (before construction and Project start-up), the plan will be updated before construction start-up and subsequently updated periodically to reflect the proposed Project and the specific responses, protocols, and response team and management contact information, once established.

#### **Appendix 3B, Attachment 5 - Milne Port - Oil Pollution Emergencies Plan**

The Milne Port Oil Pollution Emergencies Plan (OPEP) was developed to specifically assist in implementing measures to protect the marine environment and minimize impacts from potential spill events. The plan outlines potential spill scenarios, and provides specific procedures for responding to spills while minimizing potential health and safety hazards, environmental damage, and cleanup costs. The OPEP provides instructions to guide all personnel in emergency spill response situations, defines the roles and responsibilities of management and responders, and outlines the measures taken to prevent spills, the related exercise and evaluation program, and the mechanism for regular updates to the plan.

#### **Appendix 3B, Attachment 5 - Steensby Port - Oil Pollution Emergencies Plan**

The Steensby Port Oil Pollution Emergencies Plan (OPEP) was specifically developed to assist in implementing measures to protect the marine environment and minimize impacts from potential spill events. The OPEP outlines potential spill scenarios, and provides specific procedures for responding to spills while minimizing potential health and safety hazards, environmental damage, and cleanup costs.



The OPEP provides instructions to guide personnel in emergency spill response situations, defines the roles and responsibilities of management and responders, and outlines the measures taken to prevent spills. The OPEP also provides guidance on the design and implementation of the related exercise and evaluation program, and the mechanism for regular updates to the Plan.

#### **Appendix 3B, Attachment 5 - Explosives Management Plan**

Baffinland's Mary River Project will require a supply of ammonium nitrate to manufacture ammonium nitrate and fuel oil (ANFO) and emulsion explosives for blasting during the construction phase of the Project and at the open-pit mine during operation phase. This plan discusses explosives management and in particular ammonium nitrate pursuant to directives from the Nunavut Impact Review Board and Nunavut Water Board. For construction and operation, explosives will be contracted to a licensed contractor who will have a detailed operations manual for transportation, storage, and handling of explosives. The plan is therefore conceptual at this stage, since Baffinland's facilities have not been constructed and an explosives contractor has not been retained.

#### **Appendix 3B, Attachment 5 - Hazardous Materials and Hazardous Waste Management Plan**

The plan deals with wastes generated by the Mary River Project including fuel, explosives, antifreeze, used chemical products, biomedical waste and spills clean-up materials. The Hazardous Waste Management Plan presents the various disposal and treatment methods, the types and expected quantities of wastes produced and the ultimate disposal of the waste stream. The Plan also defines the roles and responsibilities, specific requirements, and monitoring controls for managing solid and hazardous wastes generated. It also presents the strategy for adaptive management and continuous improvement.

#### **Appendix 10D - Environment Monitoring and Mitigation Plans**

##### **Appendix 10D-1 - Air Quality and Noise Abatement Management Plan**

The Air and Noise Abatement Management Plan provides guidance on management of air emissions and noise from construction and operation activities. The plan includes action to control airborne particulates and noise hazards. It also defines action to mitigate, prevent, or avoid to the extent practical noise nuisance to site personnel and nearby populations. The plan addresses greenhouse gas emissions and includes an assessment of emissions from the complete lifecycle of the product, aimed at improving management of energy and greenhouse gas emissions, building emissions abatement and energy saving considerations into the business decision-making processes.

The Air Quality and Noise Abatement Management Plan is a "living document." It will be regularly updated based on management reviews (see Section 9), incident investigations, regulatory changes, or other Project-related changes.

Start of the construction phase will be a major milestone for the Project. The Air Quality and Noise Abatement Management Plan will be updated with input from the engineering, procurement, and construction management (EPCM) contractor to reflect the complexities of the construction phase.

#### **Appendix 3B, Attachment 5 - Surface Water and Aquatic Ecosystems Management Plan**

The Surface Water and Aquatic Ecosystems Management Plan outline the processes and procedures to document the quality and quantity of water that will interact with Project components over the life of the Project. It includes management practices to limit the potential for adverse impacts to receiving waters,



aquatic ecosystems, fish and fish habitat. The Plan details the management of runoff collection systems at Project facilities and addresses point and non-point discharges to surface waters from Project components and discharge quality and quantity relative to the receiving water system.

The plan addresses surface water treatment, including the identification of treatment areas and discharge locations of treated waters. It outlines specific mitigation measures required for stream/river crossings works as well as for general operation and construction activities in proximity of water courses.

The Plan identifies the roles and responsibilities, specific requirements, and mitigation and management actions for erosion and sedimentation controls for the Project. The plan includes methods for controlling erosion for both temporary and long-term stabilization efforts.

### **Appendix 3B, Attachment 5 - Wastewater Management Plan**

The Wastewater Management Plan includes information on process design, construction and commissioning, operation and maintenance, and effluent discharge to receiving environment. This includes maintenance and monitoring processes, and disposal management. As a management plan, it includes a review of existing systems and the changes needed to accommodate the projected usage increases during construction and operation. In addition, contingency measures are addressed and details given in regards to sampling, monitoring, and reporting requirements.

### **Appendix 3B, Attachment 5 - Waste Management Plan**

The Waste Management Plan outlines the waste management strategy adopted by Baffinland. Handling, storage, transportation, and disposal of waste generated by the Mary River Project will be conducted in a safe, efficient, and environmentally compliant manner. The aim of the Waste Management Plan is to implement a sound waste minimization program focused on the principles of reduction/recovery/reuse/recycling.

This Waste Management Plan deals with waste generated by the Project, including, among others, inert and hazardous solid waste (solid, semi-solid, and sludge), used oils, contaminated fuel, antifreeze, used chemical products, biomedical waste, and spill cleanup materials. Management of sewage effluent and sludge from the sewage treatment plants is the subject of the Wastewater Management Plan.

The Waste Management Plan presents the various disposal methods, types and expected quantities of waste produced, and the ultimate disposal of the waste stream. The Plan also defines roles and responsibilities, specific requirements, and monitoring controls for managing solid and hazardous waste generated by the Project. It also presents the strategy for adaptive management and continuous improvement.

### **Appendix 3B, Attachment 5 - Waste Rock Management Plan**

The Waste Rock Management Plan addresses the issues of siting, deposition of the waste rock, inspection, potential release of contaminants to the receiving environment, geotechnical stability, as well as closure considerations. As additional geochemical, geotechnical, and geological data are collected, and detailed engineering is completed, the management plan will be further optimized using an approach that best protects the environment while operating in a cost-effective manner.



**Appendix 3B, Attachment 5 - Borrow Pit and Quarry Management Plan**

The purpose of the Borrow Pit and Quarry Management Plan is to set out objectives and measures to maintain and enhance environmental performance of the quarries while avoiding to the extent practical, remedying, and mitigating any potential adverse environmental effects associated with quarrying.

Borrow pit or quarry development requires a quarry permit under the Territorial Quarrying Regulations, and if activities include the use of equipment that exceeds the thresholds of the applicable land-use regulations, a land-use permit is required. Both permits include terms and conditions specifying how operations must be conducted. A quarry lease may be applied for instead of a quarry permit if longer-term tenure is desired. Quarry operations that require blasting might require regulatory approval from the Worker's Safety and Compensation Commission.

**Appendix 10D-7 – Fish Habitat Compensation**

The objective of this compensation plan is to present and discuss the Project activities that have the potential to interact with and adversely affect freshwater and marine habitat and biota. Assessment of these effects is summarized from the Project EIS, mitigation approaches are presented, and several options are discussed as compensation for residual effects that constitute harmful alteration, disruption or destruction of fish habitat (HADD) and that will remain after mitigation, either short term or for the life of the Project, and possibly beyond.

The approach to developing this compensation is based on comprehensive aquatic effects assessment for the freshwater and marine environments. The next steps, risk assessment and determination of harmful alteration, disruption or destruction of fish habitat, and risk management are based on the DFO *Practitioners Guide to the Risk Management Framework for DFO Habitat Management Staff* (DFO nd). Finally, this plan seeks to initiate discussion of appropriate compensation measures to offset anticipated Project related harmful alteration, disruption or destruction of fish habitat, by presenting a number of approaches and conceptual plans that are being considered.

**Appendix 10D-8 - Roads Management Plan**

The Road Management Plan establishes Baffinland policies and guidelines for road use in the Project Area. The Mary River Project road network consists of the following: service roads around Milne Port facilities, road between Milne Port and mine site, service roads around the mine facilities, including the mine haul and waste rock haul roads, railway construction road between the mine and Steensby Port service roads around Steensby Port facilities. These roads will be constructed and maintained by Baffinland for the duration of the Project.

For the construction phase, the Engineering, Procurement, Construction, and Management (EPCM) contractor is responsible for road construction and maintenance. For the operation phase, the Mine Maintenance Superintendent will likely be responsible for maintenance of roads and creek crossings.

**Appendix 10D-9.1 - Railway Maintenance Management Plan**

The Railway Maintenance Management Plan will include procedures and guidance for operations of the railway between the mine site and Steensby Port, including rolling stock management, safety measures, and worker training. Before operations start, the railway will have a fully developed set of operating rules and standard procedures for inspection and maintenance of both rolling stock and infrastructure.



The railway operation will be contracted to a qualified railway operator. The Railway Superintendent will be responsible for staffing, operation, and maintenance of locomotive and rolling stock, the railway maintenance yard, the rail line, and train operation.

Bridges and culverts will be subject to the following inspections and maintenance:

- annual inspections of condition and structural integrity
- thawing of ice-blocked culverts
- maintenance of scour protection around piers and culvert inverts
- inspection and adjustment of bridges account subsidence
- safety inspections after seismic events

Records of inspections and corrective action will be kept by the Railway Maintenance Department.

#### **Appendix 10D-9.2 - Railway Emergency Response Plan**

The Railways Emergency Response Plan outlines plans in the event of a derailment and minimizes risk of a “spill” event occurring. Given the nature of the operation and the climatic conditions, the railway will be subject to a frequent and strict regimen of regular inspection and preventive maintenance, of both rolling stock and infrastructure.

To ensure compliance with the regulations for such an isolated railway operation, several members of the railway organization will be multidisciplinary and, although not necessarily members of the train-crewing team, will be qualified and experienced in the operation of trains and available to do so in emergencies.

#### **Appendix 10D-10 - Shipping and Marine Mammals Management Plan**

The Shipping and Marine Wildlife Management Plan will be updated as required on the basis of management reviews, incident investigations, regulatory changes or other Project related changes. Commencement of the Construction Phase will be a major milestone for the Project. The Shipping and Marine Wildlife Management Plan will be updated with input from the Engineering, Procurement and Construction Management (EPCM) contractor in order to reflect the complexities of the Construction Phase.

The planned operation of vessels serving the Project will involve a series of measures designed to detect, reduce or eliminate negative environmental effects, including pollution reduction as well as preparedness capability to address unplanned event. Also included in this chapter is a description of measures to address Port Security, including smuggling, an activity that could have negative socio-economic effects. The effects of the Project on marine mammals and seabirds were assessed in the EIS and were used for the development of the mitigation measures and monitoring actions proposed in this plan. These mitigation measures will be adapted or modified throughout the life of the Project in light of new information obtained from monitoring activities.

Baffinland will establish a Marine Transportation Management Team who will work under the direction of the Operation Manager. This Marine Transportation Management Team, which has expertise in shipping, environmental protection, safety, ice navigation and emergency response, will be established to manage all aspects of the marine transportation system, from the operations in Steensby Port Site and Milne Inlet to the Quebec terminal and elsewhere as detailed in this plan.



Subsequent sections of the Management Plan describe the operations that comprise marine shipping and include the specific actions to be taken with respect to mitigation and monitoring for potential environmental effects. In order to guide day-to-day operation of the shipping activity, the organization structure and associated roles and responsibilities of personnel engaged in shipping are defined, in particular with respect to achieving compliance with the Management Plan.

#### **Appendix 10D-11 - Terrestrial Environmental Management and Monitoring Plan**

The Terrestrial Environment Monitoring and Management Plan (TEMMP) provide guidance to protect and limit disturbances to vegetation, birds, and terrestrial wildlife resulting from Project activities. The plan describes mitigation and monitoring actions Baffinland will use so the Mary River Project has no net adverse impacts on the terrestrial environment. These actions include employee and subcontractor training programs, and adoption of shipping policies to reduce potential Project-related impacts.

The Terrestrial Environmental Effects Framework focuses on the targeted valued ecosystem components (VECs) and their key indicators (KIs). KIs for each VEC were chosen based on criteria outlined in Volume 2 (*Impact Assessment Methodology*), and baseline information. For justification for selecting each KI for the VECs, see various sections in the Environmental Impact Statement (EIS) Volume 6 (*Terrestrial Environment Impact Assessment*).

Baffinland's Environmental Department is responsible for monitoring compliance with applicable regulations and permit requirements. The responsibility for implementation of mitigation measures rests with the VP Operation. Compliance is achieved through ongoing monitoring, and development and implementation of operational standards, procedures, and employee training.

#### **Appendix 3B, Attachment 5 - Environmental Monitoring Plan**

The Environmental Monitoring Plan is intended to combine all the Project monitoring programs in one document. This plan details the procedures and systems that will be put in place to ensure that any environmental changes that occur are quickly observed so mitigating measures can be put in place.

This plan should be read in conjunction with the other Environment Management Plans including: Air Quality and Noise Abatement Management Plan; Surface Water Aquatic Ecosystems, Fish and Fish Habitat Management Plan; Wastewater Management Plan; Waste Management Plan; Waste Rock Management Plan; Borrow Pit and Quarry Management Plan; Fish Habitat Compensation and Monitoring Plan; Roads Management Plan; Railway Management Plan; Shipping and Marine Mammals Management Plan; and Terrestrial Environmental Management and Monitoring Plan.

#### **Appendix 10D-13 - Environmental Effects Monitoring Framework**

Baffinland Iron Mines Corporation (BIM) is committed to implement an Environmental Effects Monitoring (EEM) Program associated with its Mary River Project. This Environmental Effects Monitoring program is one component of the BIM Environment Health and Safety Management System, as described in Volume 10 of the Environmental Impact Statement (EIS). The Baffinland approach to environmental management is to seek continuous improvement in performance with documentation comprising a series of Environmental Mitigation and Environmental Monitoring Plans (EMMPs) focused on valued ecosystem components (VEC).



It is the intention of Baffinland to establish cooperative environmental arrangements between the company, the QIA (Qikiktani Inuit Association) and the Inuit of Northern Baffin Island to protect both the environment as well as the traditional relationship of the Inuit peoples with the natural environment.

There are specific purposes for conducting an Environmental Effects Monitoring program. These are:

1. To assist in the identification of target species and linkages for monitoring;
2. To provide baseline data so that project activities can be scheduled or planned to avoid or reduce conflict;
3. To verify effects predictions;
4. To evaluate the effectiveness of mitigation;
5. To identify unforeseen environmental effects;
6. To provide an early warning of undesirable change in the environment; and
7. To improve the understanding of cause-and-effect relationships.

#### **Appendix 10D-14 – MMER Environmental Effects Monitoring Study Design Framework**

This document describes a study design framework for an MMER Environmental Effects Monitoring Study Design Framework for the Mary River Project. The study design will address Environment Canada requirements under the Metal Mining Effluent Regulations (MMER). The Metal Mining Effluent Regulations (MMER), under the *Fisheries Act*, require metal mines to undertake environmental effects monitoring (EEM) to ensure the adequate protection of all receiving aquatic environments.

#### **Appendix 10E - Health and Safety Management Plan**

Baffinland is committed to protecting the safety and health of our employees and contractors, and the communities in which we operate. To implement the Sustainable Development Policy, Baffinland will conform to company environmental, health, and safety (EHS) management systems, standards, codes of practice, and guidelines. Baffinland values include specific expectations surrounding safety and health, and social and environmental responsibility. Baffinland has an Environmental, Health, and Safety Corporate Committee, Environmental, Health, and Safety Charter, and Code of Business Conduct and Ethics to support these values. These documents are posted on the company's website. Baffinland's Health and Safety Management Plan is based on the principle of continuous improvement and is consistent with the Occupational Health and Safety Management System (OHSAS) 18001, dated 2007. Baffinland's Health and Safety Management Plan is in place to control health and safety risks of company activities. This plan contains the following elements:

- Policy
- Legal Requirements
- Hazard identification and Risk Assessment
- Health and Safety Targets and Objectives
- Roles and Responsibilities
- Training and Awareness

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- Reporting and Documentation
- EHS Communication
- Operational Control
- Emergency Preparedness and Response
- Performance Measurement and Monitoring
- Accidents, Incidents, Non-Conformance, and Corrective/Preventive Actions
- Records and Records Management
- Audits and Assurance
- Management Review

## **Appendix 10F - Socio-Economic Environment Management Plans**

### **Appendix 10F-1 - Stakeholders Engagement Plan**

The Stakeholder Engagement Plan establishes the approach, strategy, and means by which

Baffinland will communicate with the Project stakeholders. It draws on knowledge gained from past consultation and engagement practices, and focuses on maintaining and improving existing stakeholder relationships. Engagement will be of particular importance during the construction phase of the Project, as relationships are developed and solidified. As the Project moves forward, the Stakeholder Engagement Plan will be refined and updated to provide relevant engagement guidance specific to subsequent phases of the Project.

The Stakeholders Engagement Plan provides guidance on communicating effectively with Inuit people and other stakeholders. It describes the types of materials that might be used to support that engagement and defines the objectives, approach, and types of engagement activities that might be used during the construction phase. It also describes who is responsible for implementing, monitoring, and reporting on the engagement programs.

The complaints management process is also presented, detailing the process by which Baffinland intends to deal with stakeholder complaints about the Project. This process defines the procedure for recording, screening, resolving, monitoring, reporting, recordkeeping, and archiving activities associated with the complaints process.

The SEP presents specific commitments to organize and systematically implement the concepts presented in the plan, commitments for consultation and engagement with a variety of stakeholders, and commitments to engage employees in development of the Mary River Project.

### **Appendix 10F-2 - Cultural and Heritage Resource Protection Plan**

This Heritage Resource Protection Plan (HRPP) has been developed at a concept level to support the environmental impact statement (EIS) for the Mary River Project (the Project). As the Project moves forward, this plan will be updated or replaced with more detailed plans as appropriate to support project execution.



Archaeological resources are non-renewable finite resources and are of value not only to local communities, but to the territory of Nunavut, Canada, and to the entire world. They are important sources of historical knowledge and cultural identity. Archaeological sites can be disturbed by any activity that causes ground disturbance and are often not readily identifiable by the untrained eye. Specifically for mining projects, archaeological sites can be directly affected by such activities as mine excavations, construction of camps, docks, and associated facilities, construction of both winter and all-season roads, and development of quarry and borrow sites. Sites can also be affected by ongoing operations and road use, as well as by the presence of increased numbers of people in an area.

The North Baffin region and the Project area have a very rich archaeological history. This HRPP describes the processes by which ground-disturbing activities can be carried out with appropriate assessments by project archaeologists, and also lays out the procedures for addressing chance finds of archaeological resources during construction activities.

### **Appendix 10F-3 - Human Resource Management Plan**

Baffinland's Human Resources Management Plan ensures that the needs of Baffinland personnel are addressed throughout the life of the Mary River Project (the Project). The plan consists of the following elements:

- human resources management principles and policies
- organizational planning:
  - human resource information systems
  - employee communications
- recruitment and placement programs
- training and development
- medical program
- employee relations
- compensation plans and gain sharing
- benefit programs
- health and safety programs
- incorporation of relevant Inuit Impact and Benefits Agreement (IIBA) terms and conditions

Baffinland human resources management policies and practices must also comply with the requirements of the IIBA between Baffinland and the Qikiqtani Inuit Association (QIA) as contemplated in Article 26 of the Nunavut Land Claims Agreement (NLCA).

### **Appendix 3B, Attachment 5 - Preliminary Mine Closure and Reclamation Plan**

The Preliminary Mine Closure and Reclamation Plan presented herein reflects Baffinland's intent to bring the Project into production and is based on the current available information at this time. The Preliminary Mine Closure and Reclamation Plan was developed to support the Environmental Impact Statement (EIS)



and does not constitute a complete Closure Plan. Furthermore, the document assumes that the reader is familiar with the EIS and references the EIS document.

As the Project develops through the feasibility and detailed design phases, the Project may undergo some changes from the information provided. However, it is anticipated that the major components of the Project will not change. The plan presented, is to be considered a 'living document' to be updated as the Project continues to develop, when required. It is understood that Baffinland will be responsible for carrying out the rehabilitation measures described in the Preliminary Closure Plan in accordance with this document, including any future changes.

The purpose of this document is to provide a reclamation plan for the Mary River Project in accordance with the regulatory framework established by the Inuit, Federal and Territorial governments to support the EIS.

The main objectives of the above guidelines and regulations are to:

- Return the Project affected and viable sites (Mine Site, Milne Port and Steensby Port) to "wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and human activities" (Natural Resources Canada 1994).
- Where practicable, undertake progressive reclamation to reduce the environmental risk and advance the environmental protection (INAC 2002, INAC 2002a, NWTWB 1990 and QIA 2009).
- Provide for the reclamation of all affected sites and areas to a stable and safe condition. Where practical, affected areas will be returned to a state compatible with the original undisturbed area (*Territorial Land Use Regulations*).
- Reduce the need for long-term monitoring and maintenance by designing for closure and instituting progressive reclamation, as possible.
- Provide for mine closure using the current available proven technologies in a manner consistent with sustainable development.
- Return all altered water courses to their original alignment and cross-section (*Territorial Land Use Regulations*).

In accordance with the above objectives the main goals of the Preliminary Closure Plan are:

- Provide the long term physical and chemical stability of the Project areas so as to protect the public health and safety and ecosystem integrity.
- Promote natural revegetation and recovery of disturbed areas that is compatible with the surrounding natural environment and to allow for the future use by people and wildlife.
- Implement design and progressive reclamation to limit the need for long term maintenance and monitoring.
- Reduce environmental effects once operations have ceased.