



Human Health and Exposure Potential Assessment

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Phase 2 Proposal / ᓂᓐᓂᓐ ᓂᓐᓂᓐ ᓂᓐᓂᓐ

Public Hearing Iqaluit and Pond Inlet January 2021
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Presentation Overview

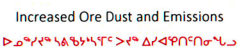
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- Description of Assessment
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- Assessment Findings
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- Mitigation and Monitoring
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- Technical Review Summary
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- Project Certificate Conditions
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- Summary
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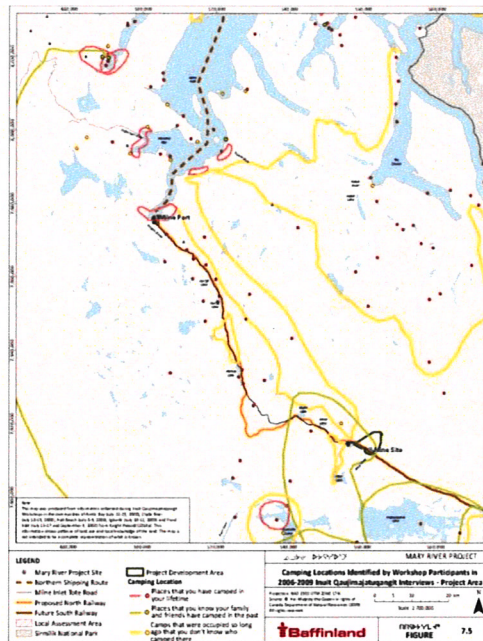
ፌዴራል ልማት ሚኒስቴር
ፍጅጋሪ ልማት



Key Issues Summary

ለጎረቤታችሁ ጋራ ልሳን ሆነን

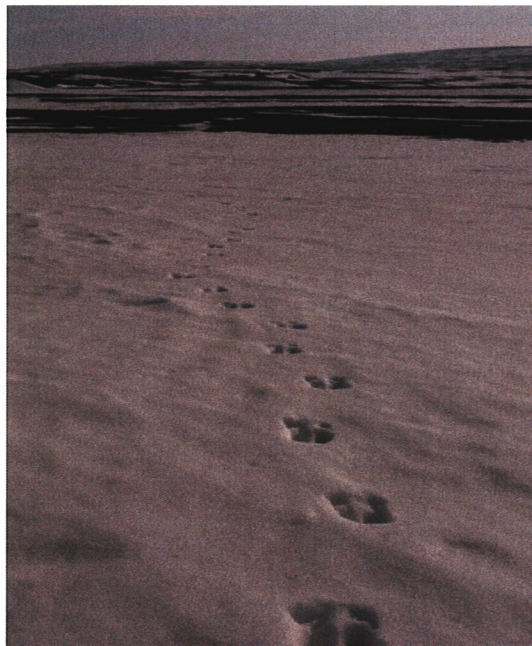
- Community concerns: / ወደፍጥረት ልዩነቶች:
 - metals in dust
የአፍኑህ ንፍቅ
 - food safety
የምግብ አጠቃቀም
 - drinking water safety
ለጥጥር ውሃ አጠቃቀም
 - animal health
እንስሳት ጤና
 - air quality
የአየር ንፍቅ



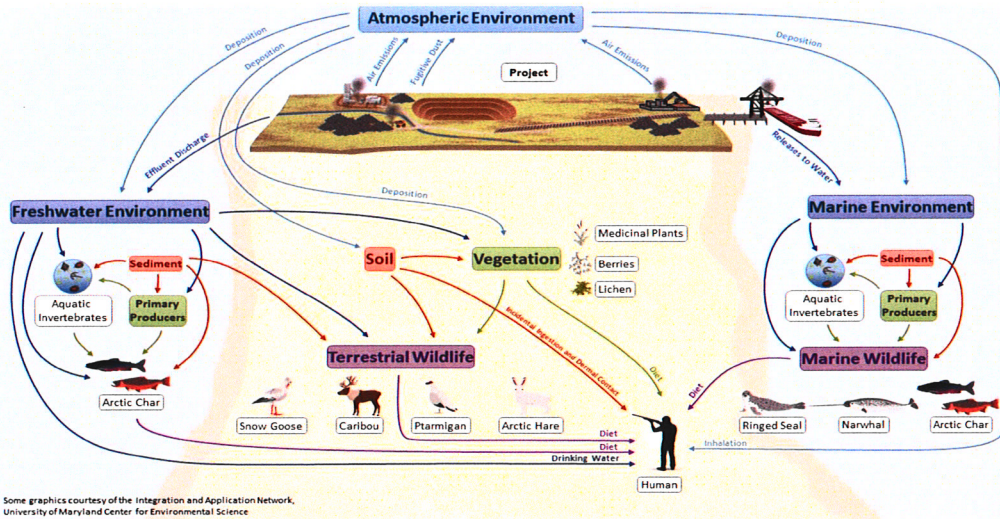
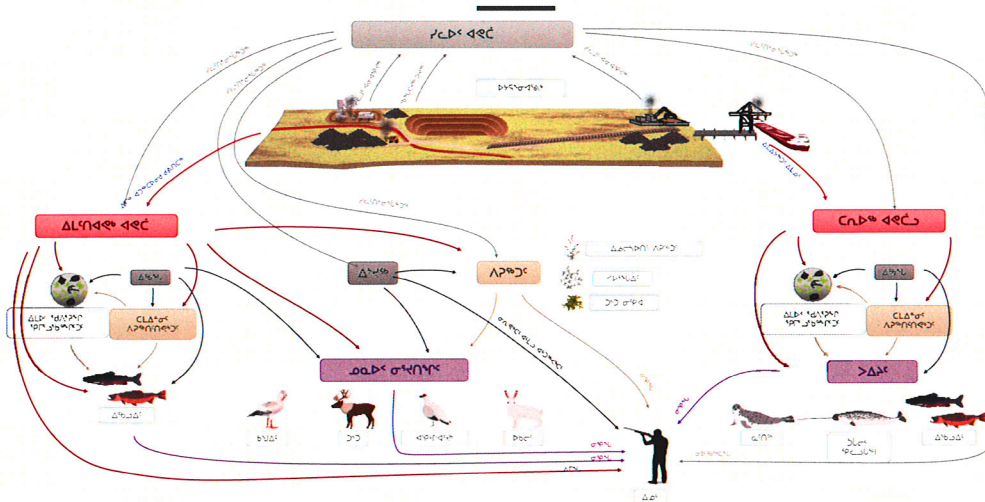
Focus of Assessment

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- [illegible]



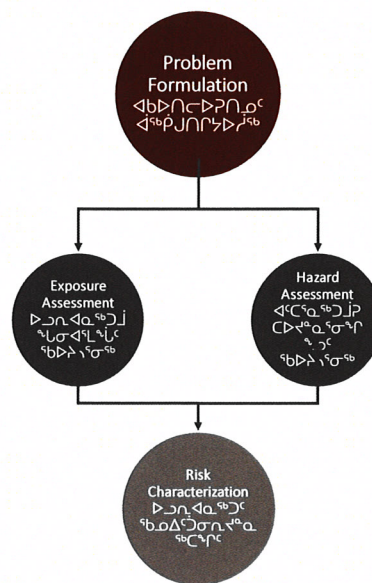
Potential Linkages Between Project and Environment

[illegible]

Assessment Methodology

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- Followed Health Canada Guidance
 $L_{\text{C-CD}}/L_{\text{C}} \leq C_{\text{F}} \cdot \frac{1}{\text{Dose-toxicity}} \cdot \frac{1}{\text{Dose-toxicity}}$
- Protective Assumptions
 $L_{\text{C-CD}}/L_{\text{C}} \leq C_{\text{F}} \cdot \frac{1}{\text{Dose-toxicity}}$
- Upper bound operational conditions
 $\frac{1}{\text{Dose-toxicity}} \leq C_{\text{F}} \cdot \frac{1}{\text{Dose-toxicity}}$
- Families with young children and Elders
 $\frac{1}{\text{Dose-toxicity}} \leq C_{\text{F}} \cdot \frac{1}{\text{Dose-toxicity}}$
- Short and long term exposure potential
 $\frac{1}{\text{Dose-toxicity}} \leq C_{\text{F}} \cdot \frac{1}{\text{Dose-toxicity}}$
- Local hunting and gathering
 $\frac{1}{\text{Dose-toxicity}} \leq C_{\text{F}} \cdot \frac{1}{\text{Dose-toxicity}}$



Existing Conditions and Study Area – Mine Site

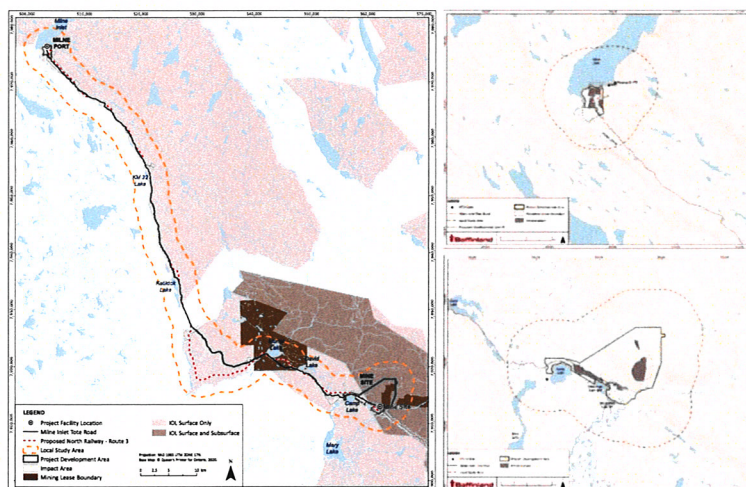
אנחנו

[illegible]

ፍፅላት ለሰጡ ምስጋና ይቀርባል።

၄၃၂၂၄၈

▷ ၄၁၈ ◁ ၄၁၉



Additional Assessment Information ማግኘት ይቻላል

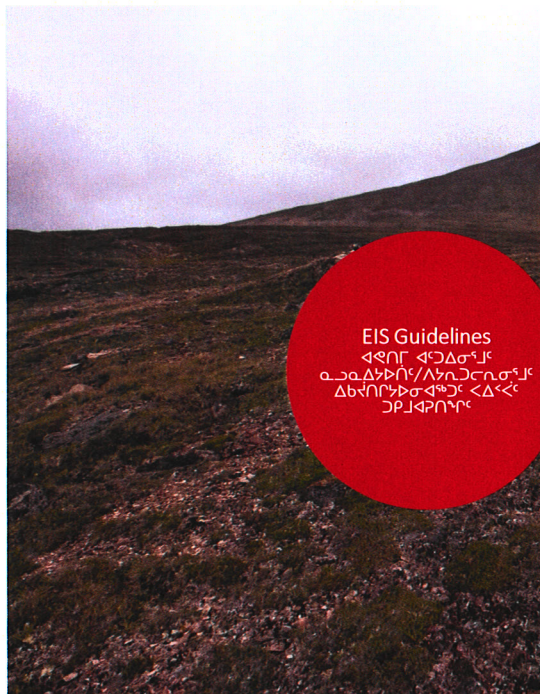
Key Issues / ለጥያቄው ዋና ጉዳዮች

- Human Health Risk Assessment
 ለሰው ጤና ጉዳዮች የሚፈጸም የጥናት ምርመራ
- Inhalation Assessment of Combustion Emissions
 የጥንቃቄ ምርመራ የሰው ጤና ጉዳዮች
- Human Health Based Dustfall Thresholds
 ለሰው ጤና ጉዳዮች የሚፈጸም የጥናት ምርመራ
- Food Security Assessment
 የጥንቃቄ ምርመራ የሰው ጤና ጉዳዮች
- Worked Example of Exposure and Risk Estimates
 ለሰው ጤና ጉዳዮች የሚፈጸም የጥናት ምርመራ



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Additional Study

የጥንቃቄ ምርመራ ለሰው ጤና ጉዳዮች



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Conclusions

[illegible]

- Mining activities will result in release of dust from the ore in the vicinities of the Mine Site and Milne Port, and from road dust along the Northern Transportation Corridor.

[illegible]

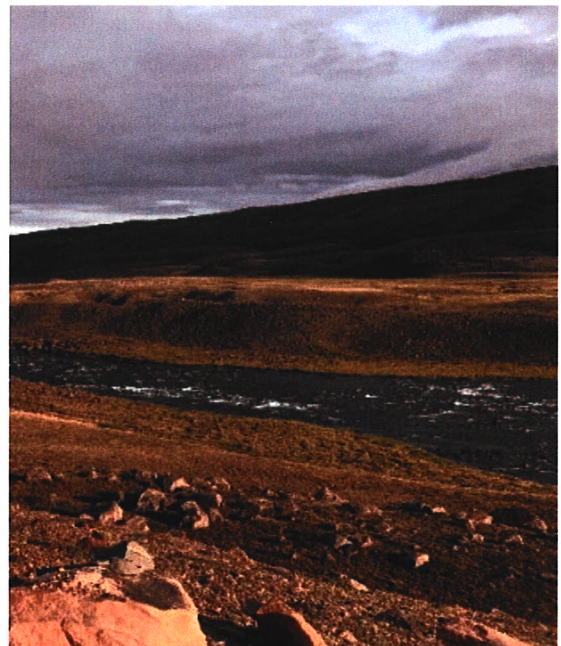
Conclusions

[illegible]

- Once rail is constructed, dust levels from transportation of ore will be greatly reduced

ካልንጋሪ ምርጥ ንፅፁር ዘለዎም ስባእ ተጠቒሞ ነፃነት ክገኝ ይገቡ

ጉረኤም ምስቲ ስባእ ተጠቒሞ ነፃነት ክገኝ ይገቡ



Conclusions

[illegible]

- Ore dust deposition from the Project is not predicted to result in levels of metals in the Local Study Area that would be harmful to the health of animals considered in the assessment, including caribou, arctic hare, ptarmigan, snow goose, narwhal, ringed seal, and sea run arctic char



Conclusions

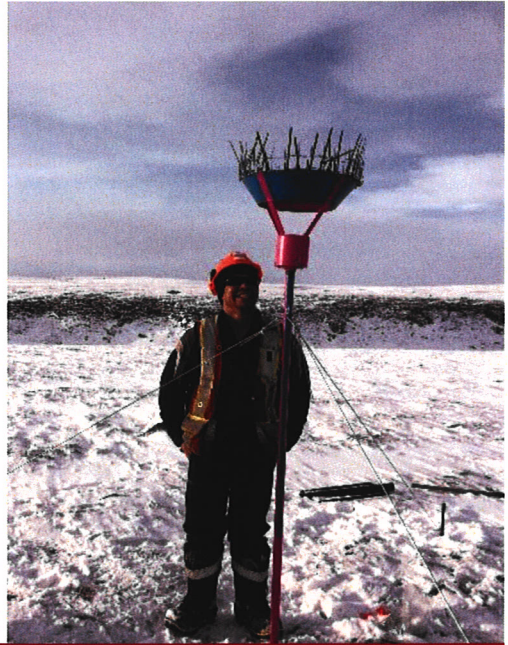
[illegible]

- Project related health risks associated with country foods consumption from the local study area are negligible;
ለተጠቃሚዎች ስሜት የሚጠቀሙ የግብርናው ምርቶችን በጥንቃቄ በማጥፋትና በማጥፋት ለመጠቀም ማስጠንቀቂያ ማድረግ ይቻላል፤
- Project related health risks continue to be negligible when additional exposure pathways are considered (drinking surface water; ingestion of soil and dust; inhalation of air);
ለተጠቃሚዎች ስሜት የሚጠቀሙ የግብርናው ምርቶችን በጥንቃቄ በማጥፋትና በማጥፋት ለመጠቀም ማስጠንቀቂያ ማድረግ ይቻላል፤



Conclusions

- Some air quality guideline exceedances are predicted at the boundary of the Project Development Area at the Mine and Port sites, however the overall risks to human health remain low;
ᐃረኅየር ስራ ለዕንብረት የምትመዘግቡ ኢነርጂና ምጣኔ ደረጃዎች በአጠቃላይ ሲያስተማማኙ ሆኖ ለሀይልና ለጤና አደጋ ሊጠቁም ይችላል።
- Inhalation risks associated with dustfall and air releases for land users outside the Project Development Area are low;
በዓለብ አካባቢው ውስጥ ብቻ የሚኖሩ ሰዎች የእድገትና የምጣኔ አደጋ ሊጠቁም ይችላል።



Conclusions

- Nitrogen dioxide concentrations are predicted to meet the Nunavut Air Quality Standard but exceed the Canadian Ambient Air Quality Standard at some locations outside the Project Development Area.



▷ ၁၈၆၁ ခုနှစ် ဇူလိုင်လ ၁ ရက်နေ့

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[illegible]

- Switch from ore trucks to rail
 ስለጥቅም ምርት ለመቀየር ለጥቅም ምርት ለመቀየር ለጥቅም ምርት ለመቀየር
- Road dust suppression and speed limits
 ለጥቅም ምርት ለመቀየር ለጥቅም ምርት ለመቀየር ለጥቅም ምርት ለመቀየር
- Indoor Crushing at Port
 ለጥቅም ምርት ለመቀየር ለጥቅም ምርት ለመቀየር ለጥቅም ምርት ለመቀየር
- Shrouding on crushers, screens and conveyor transfers
 ለጥቅም ምርት ለመቀየር ለጥቅም ምርት ለመቀየር ለጥቅም ምርት ለመቀየር





Project Mitigation

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[illegible]

- Low-emission vehicles and idling policy
 ፈተና ሲካሄድ የሚገኝ ሙሉ ምርመራ ሲሆን ለፍጥነት ማሻሻያና ለከፍተኛ የኃይል ጥቅም ማረጋገጫ ማድረግ ይገባል፡፡
- Application of Dust Suppressant on Stockpiles at Milne Port
 ለጥንቃቄ ማድረግና ለጥንቃቄ ማድረግ የሚገባውን ምርመራ ማድረግ ይገባል፡፡

Each of these mitigations have subsequent beneficial effects for minimizing effects on human health and country foods by reducing risk for pathway

[illegible]

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Monitoring and Follow-up Programs

உதாரணம்: $\frac{1}{2} \times \frac{3}{4} = \frac{1 \times 3}{2 \times 4} = \frac{3}{8}$

ፕላንና ማስተካከያ

Baffinland will continue with monitoring during all phases
(including closure). / <ᐱᑦᓕᔭᒃᐅ ᐸᐳᑦᑎᐁᖃᑦ ᑕᓂᐴᖃ>ᖃ ᑕᐻᐲᐙᓂᑕᑏᖃ
ᐱᑦᓕᔭᐼᓂᖃᓄᐰᑦᓈᓄᑦ (ᐱᖃᗪᐾᑆᑇᑐᑚᑕᑉᐵᓄᐷ).

Comprehensive monitoring programs:

Air Quality / ፖሊጥ ለጋራ ጥራ ጥላቻ

- Continuous on-site air quality monitoring
ከተሳሳቱ ድንኳኖች ላይ ስርዓተ ምርት ላይ ሲገኝ የአየር ንፍሰት ማረጋገጫ
- Seasonal off-site air quality monitoring
የድንጋይ ልዩነት ድንኳኖች ላይ ስርዓተ ምርት ላይ ሲገኝ የአየር ንፍሰት ማረጋገጫ
- Monthly dustfall monitoring
የድንጋይ ልዩነት ድንኳኖች ላይ ስርዓተ ምርት ላይ ሲገኝ የአየር ንፍሰት ማረጋገጫ



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Monitoring and Follow-up Programs

உதாரணம் 1: பிழைப்பதற்கான பதிலைத் தரும்

[illegible]

Terrestrial environment / **ᄡᄡᄡ ᄡᄡᄡᄡ**

- Soil
ᑭᐱ ልኒ
- Lichen and other Biota
ባህልድና ልኒ ልኒ ሆኖ ሊገኝ ይችላል
- Caribou Tissue Sampling
ንጥል ንጥል ሲያውጡ የሚገኙትን ሆኖ ሊገኝ ይችላል



Monitoring and Follow-up Programs

உதாரணம்: $2x^2 + 3x - 5$ மற்றும் $x^2 - 4x + 7$ இன் கூடுதல்

ፍፅላት ለጋራ ጥራት ለጋራ ጥራት

Freshwater environment / $\Delta\Gamma\Delta^{\circ}\Delta\epsilon\Gamma\Delta^{\circ}\Delta$

- [illegible]

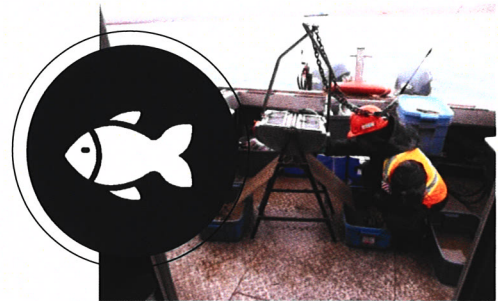


Monitoring and Follow-up Programs

உதாரணமாக, $2^3 = 8$ எனில், 2 இன் 3 வது வலுவாக 8 ஆகிறது.

[illegible]Marine environment / **ርከፈ ልዩነት**

- Sediment and surface water
 $\Delta \text{ሴኔዳር ሲባል ነው}$
- Fish health, benthic invertebrates
 $\Delta \text{ሴኔዳር የሚጠይቁትን ተስተካክሎ የሚያሳይ ይመስለኛል}$



Risk Communication Strategy

[illegible]

- Baffinland commits to develop a risk communication strategy focused on the gathering and dissemination of information to Inuit related to the Mary River Project, and linkages between the Project and human health and ecological risk assessment topics.

[illegible]

Risk Communication Strategy

[illegible]

- The strategy will focus on building capacity within community groups to understand the mining process, elements of the mining process and how substances produced from the mining process move in the environment.

[illegible]

- Baffinland will work with communities to develop this program to ensure it is relevant to Inuit.

[illegible]

Adaptive Management

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- Multiple Adaptive Management Programs link to human health and environment (air quality, terrestrial, freshwater, marine)

[illegible]

- Qikiqtani Inuit Association and Baffinland will jointly develop and approve the AMP and sub-plans.

[illegible]

- A working group will oversee the development of the AMP

AMP

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- 30

▷σ^b▷ρ_h▷

- Risk assessment studies were completed
ᐃᑦᑕᓐᓇᓐᓂᓐᓯᓐᓄᓐ ᖅᐅᔨᔪᐃᓂᐅᓐᓴᓐ ᐱᔭᐲᓐᑕᐅᓚᐅᓐᖅᑐᓐ
- Protective assumptions
ኣኀᔪᐅᓐᓂᓐᑕᐅᔭᐲᓚᓐᓂᓐᑐᓐ ᐃᓯᐲᓯᔭᐅᓐᓴᓐ
- Included assessment of major exposure pathways
ᐱᖅᔭᐅᔭᔭᔭᔭᔭᔭᔭ ᖅᐅᔨᔪᔭᐅᓚᐅᓐᓂᓐᑐᓐ ᐃᓯᔭᓐᓴᓐ ᐃᓂᖅᓂᓐᓂᓐᑕᓐ ᐃᓂᓐᓂᓐᓂᓐᓂᓐᓂᓐᓂᓐ
- Project-related health risks in the Local Study Area to Inuit Land users are negligible to low
ᐱᓐᓴᓐᓂᓐᓂᓐ ᐃᓂᓐᓂᓐᓂᓐᓂᓐᓂᓐᓂᓐ ᐅᓚᓐᓂᓐᓂᓐᓂᓐ ᖅᐅᔨᔪᐃᐃᐅᓐᓴᓐ ᐃᓂᓐᓂᓐᓂᓐ
ᐃᓂᓐᓂᓐᓂᓐᓂᓐᓂᓐᓂᓐᓂᓐ ᐃᓂᓐᓂᓐᓂᓐᓂᓐᓂᓐᓂᓐ
- Project is not predicted to result in levels of metals in the Local Study Area that would be harmful to the health of animals considered in the assessment
ᐱᓐᓴᓐᓂᓐᓂᓐ ᐃᓂᓐᓂᓐᓂᓐᓂᓐᓂᓐᓂᓐ ᐅᓚᓐᓂᓐᓂᓐᓂᓐ ᐃᓂᓐᓂᓐᓂᓐᓂᓐ ᐃᓂᓐᓂᓐᓂᓐᓂᓐᓂᓐ
ᐅᓚᓐᓂᓐᓂᓐᓂᓐᓂᓐᓂᓐᓂᓐᓂᓐᓂᓐ



- [illegible]



Δ'ጋሩ ሲገቡ 622, ልጁ ልጋሩን,
 ልጁ ሲገቡ 102
 ልጁ, ጋራ X0A 0H0

