



SEP 08 2017

Ms. Elizabeth Copland
Chairperson
Nunavut Impact Review Board
c/o Ms. Jenny Klengenberg
< info@nirb.ca >

Dear Ms. Copland:

Thank you for your correspondence of August 16, 2017, regarding the Nunavut Impact Review Board's (NIRB) screening decision report for the "Kitikmeot Region Marine Science Study" project proposal.

Fisheries and Oceans Canada (DFO), through the Fisheries Protection Program, reviewed this proposal and determined that authorization under the *Fisheries Act* was not required. DFO did, however, provide comments to the NIRB on July 20, 2017, regarding avoiding disturbance to marine mammals.

DFO has reviewed the NIRB's screening decision report in relation to the Department's mandate, and I appreciate the consideration given to the Department's advice. I support the Board's conclusions and recommendations and would like to thank the Board for its diligence in reviewing the proposal.

Yours sincerely,

Dominic LeBlanc, P.C., Q.C., M.P.
Minister of Fisheries, Oceans and the Canadian Coast Guard

c.c.: The Honourable Catherine McKenna, P.C., M.P.
Minister of Environment and Climate Change
The Honourable Paul Quassa, M.L.A.
Nunavut's Minister responsible for Nunavut Arctic College

Minister / Ministre (DFO/MPO)

From: NIRB Enterprise Management System <noreply@nirb.ca>
Sent: August-16-17 5:04 PM
To: ccems@nirb.ca
Subject: NIRB 125154 / 17YN061: Screening Decision Report for Fisheries and Oceans Canada's "Kitikmeot Region Marine Science Study" Project Proposal
Attachments: 170816-17YN061-Cover Ltr Re Screening Decision Report-OT7E.pdf; 170816-17YN061-Screening Decision Report-OT7E.pdf
Categories: WEST/National

16-Aug-2017

Dear Honourable Ministers:

Please find attached the Nunavut Impact Review Board's (NIRB or Board) Cover Letter and the Screening Decision Report for Fisheries and Oceans Canada's "Kitikmeot Region Marine Science Study" project proposal (NIRB: 17YN061; NPC: 148583).

Further, please note that the Notice of Release of Screening Decision Report for this file will be forwarded to the offices responsible for issuing any authorizations related to this project.

Best regards,

Jenny Klengenberg
Environmental Administrator

Nunavut Impact Review Board
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Following the assessment of all material information provided, the NIRB is recommending that a review of Fisheries and Oceans Canada's "Kitikmeot Region Marine Science Study" project is not required pursuant to paragraph 92(1)(a) of the NuPPAA.

Pursuant to its discretion under paragraph 92(2)(a) of the NuPPAA, the NIRB has determined that specific terms and conditions are appropriate for this project.

Accordingly, the NIRB is issuing the attached Screening Decision Report dated August 16, 2017 to the responsible Minister(s). The Screening Decision Report provides, among other things, the regulatory framework, project overview and the NIRB's assessment process, factors relevant for the determining significance of impacts and recommended project-specific terms and conditions.

Please note that the project proposal will not be enclosed due to the size of the electronic document and the limited bandwidth. However, an electronic copy of the project proposal is accessible online from the NIRB's online public registry at www.nirb.ca by using any of the following search criteria:

- Project Name: Kitikmeot Region Marine Science Study
- NIRB File No.: 17YN061
- Application No.: 125154

We look forward to receiving a response from the responsible Minister(s). If you have any questions or require clarification, please do not hesitate to contact the NIRB's Director, Technical Services, Tara Arko at (867) 983-4611 or tarko@nirb.ca.

Sincerely,



Elizabeth Copland, Chairperson
Nunavut Impact Review Board

Enclosure: Screening Decision Report, NIRB File No.: 17YN061 (August 16, 2017)



SCREENING DECISION REPORT NIRB FILE No.: 17YN061

NPC File No.: 148583

August 16, 2017

Following the Nunavut Impact Review Board's (NIRB or Board) assessment of all materials provided, the NIRB is recommending that a review of Fisheries and Oceans Canada's "Kitikmeot Region Marine Science Study" is not required pursuant to paragraph 92(1)(a) of the *Nunavut Planning and Project Assessment Act* (NuPPAA).

Subject to the Proponent's compliance with the terms and conditions as set out in below, the NIRB is of the view that the project proposal is not likely to cause significant public concerns, and it is unlikely to result in significant adverse environmental and social impacts. The NIRB therefore recommends that the responsible Minister(s) accepts this Screening Decision Report.

OUTLINE OF SCREENING DECISION REPORT

- 1) REGULATORY FRAMEWORK
- 2) PROJECT REFERRAL
- 3) PROJECT OVERVIEW & THE NIRB ASSESSMENT PROCESS
- 4) FACTORS FOR DETERMINING SIGNIFICANCE OF IMPACTS
- 5) VIEWS OF THE BOARD
- 6) RECOMMENDED PROJECT-SPECIFIC TERMS AND CONDITIONS
- 7) REPORTING REQUIREMENTS
- 8) OTHER NIRB CONCERNS AND RECOMMENDATIONS
- 9) REGULATORY REQUIREMENTS
- 10) CONCLUSION

REGULATORY FRAMEWORK

The primary objectives of the NIRB are set out in Section 12.2.5 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada* (Nunavut Agreement) as follows:

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

These objectives are confirmed under section 23 of the NuPPAA.

The purpose of screening is provided for under section 88 of the NuPPAA:

“The purpose of screening a project is to determine whether the project has the potential to result in significant ecosystemic or socio-economic impacts and, accordingly, whether it requires a review by the Board...”

To determine whether a review of a project is required, the NIRB is guided by the considerations as set out under subsection 89(1) of NuPPAA:

“89. (1) The Board must be guided by the following considerations when it is called on to determine, on the completion of a screening, whether a review of the project is required:

- (a) a review is required if, in the Board’s opinion,*
 - i. the project may have significant adverse ecosystemic or socio-economic impacts or significant adverse impacts on wildlife habitat or Inuit harvest activities,*
 - ii. the project will cause significant public concern, or*
 - iii. the project involves technological innovations, the effects of which are unknown; and*
- (b) a review is not required if, in the Board’s opinion,*
 - i. the project is unlikely to cause significant public concern, and*
 - ii. its adverse ecosystemic and socioeconomic impacts are unlikely to be significant, or are highly predictable and can be adequately mitigated by known technologies.”*

It is noted that subsection 89(2) provides that the considerations set out in paragraph 89(1)(a) prevail over those set out in paragraph 89(1)(b).

Where the NIRB determines that a project may be carried out without a review, the NIRB has the discretion to recommend specific terms and conditions to be attached to any approval of the project proposal. Specifically, paragraph 92(2)(a) of NuPPAA provides:

“92. (2) In its report, the Board may also
(a) recommend specific terms and conditions to apply in respect of a project that it determines may be carried out without a review.”

PROJECT REFERRAL

On June 12, 2017 the NIRB received a referral to screen Fisheries and Oceans Canada’s (DFO) “Kitikmeot Marine Science Study” project proposal from the Nunavut Planning Commission (NPC or Commission) which noted that the project proposal is outside the area of an applicable regional land use plan. Pursuant to Article 12, Sections 12.4.1 and 12.4.4 of the Nunavut Agreement and section 87 of the NuPPAA, the NIRB commenced screening this project proposal and assigned it file number 17YN061.

1. Project Scope

The proposed “Kitikmeot Region Marine Science Study” project is located within the Kitikmeot region between Dolphin and Union Strait in the west and Larsen Sound in the north and east. The Proponent intends to conduct baseline oceanographic data and evaluate marine ecosystem structure in the Kitikmeot region. The program is proposed to take place seasonally from August to September 2017 until 2021.

As required under subsection 86(1) of the NuPPAA, the Board accepts the scope of the “Kitikmeot Region Marine Science Study” as set out by DFO in the project proposal. The scope of the project proposal includes the following undertakings, works, or activities:

- Use of research vessel (RV) *Martin Bergmann* (sixty two feet (ft) in length) to conduct research activities with a capacity of up to thirteen (13) personnel;
- Use of an aluminum skiff (sixteen (16) ft in length) to transport personnel to and from land, and for oceanographic sampling in shallow water from various river mouths;
- Occasional use of float plane to transport crew and scientist to the RV *Martin Bergmann* for ship change;
- Use of local facilities in Cambridge Bay and the Canadian High Arctic Research Station;
- Collect oceanographic samples and data measurements as follows:
 - Vertical rosette water sampling for ocean geochemistry, primary production, dissolved nutrients, salinity, dissolved inorganic carbon, dissolved organic matter and stable isotopes;
 - Collect temperature, salinity, dissolved oxygen, chlorophyll fluorescence, turbidity and underwater light with the use of a conductivity, temperature and depth (CTD) instrument;
 - Use of a tethered submersible camera for underwater video;
 - Collect information on water velocity, dissolved nutrients, and backscatter from zooplankton and fish using an Acoustic Doppler Current Profiler;
 - Use of hydrophones to listen to marine mammals and ship noise;
 - Collect benthic organisms and seafloor mud with small bottom grab and box core samplers;
 - Collect zooplankton samples with fine mesh net;
 - Measure surface currents with small Global Positioning System (GPS) surface drifters;
 - Deployment/recovery of temporary subsurface moorings at six (6) locations with electronic sensors and acoustics mounted to collect oceanographic samples and data measurements. Moorings to be anchored to the seafloor and reaching to 15 metres (m) below the surface;
- Use of fuel and chemicals for the research activities; and
- Disposal of combustible and non-combustible wastes as well as sewage at the appropriate facilities in Cambridge Bay.

2. Inclusion or Exclusion to Scoping List

The NIRB has identified no additional works or activities in relation to the project proposal. As a result, the NIRB will proceed with screening the project based on the scope as described above.

The NIRB however notes that it has screened the ship-based activities under NIRB File No. 13YN022 and the activities were allowed to proceed without a review being required under Section 12.4.4(a) of the Nunavut Agreement with recommended terms and conditions. The NIRB further notes that the above based research activities are linked to the undertaking of the ship activities.

3. Key Stages of the Screening Process

The following key stages were completed:

| Date | Stage |
|----------------------------------|---|
| June 12, 2017 | Receipt of project proposal and screening referral from the NPC |
| June 12, 2017 & June 23, 2017 | Information request(s) |
| July 14, 2017 | Proponent responded to information request(s) |
| July 14, 2017 | Scoping pursuant to subsection 86(1) of the NuPPAA |
| July 18, 2017 | Public engagement and comment request |
| July 28, 2017 | Receipt of public comments |

4. Public Comments and Concerns

Notice regarding the NIRB's screening of this project proposal was distributed on July 18, 2017 to community organizations in Cambridge Bay, Kugluktuk, Gjoa Haven, Taloyoak and Kugaaruk, as well as to relevant federal and territorial government agencies, Inuit organizations and other parties. The NIRB requested that interested parties review the proposal and the NIRB's *proposed* project-specific terms and conditions, and provide the Board with any comments or concerns by July 28, 2017 regarding:

- Whether the project proposal is likely to arouse significant public concern; and if so, why;
- Whether the project proposal is likely to cause significant adverse eco-systemic or socio-economic effects; and if so, why;
- Whether the project proposal is likely to cause significant adverse impacts on wildlife habitat or Inuit harvest activities; if so, why;
- Whether the project proposal is of a type where the potential adverse effects are highly predictable and mitigable with known technology, (please provide any recommended mitigation measures); and
- Any matter of importance to the Party related to the project proposal.

The following is a summary of the comments and concerns received by the NIRB:

Environment and Climate Change Canada (ECCC)

- No comments at this time.

Fisheries and Oceans Canada (DFO)

- Noted the Marine Mammal Regulations found in Section 7 of the *Fisheries Act*.
- Recommended that the watercraft should survey the area for marine mammals.

- Stated that watercraft should not accelerate within 400 metres (m) of the marine mammals and should not be approached closer than 100 m at any time.
- Recommended if marine mammals are encountered, and remain in the area, efforts should be made to avoid disturbing them by rerouting, slowly navigating around their location at a reduced speed and maintaining their distance.

Indigenous and Northern Affairs Canada (INAC)

- No comments or additional terms and conditions to offer at this time.

Transport Canada (TC)

- Noted key areas of potential interest to TC including the proposed use of moorings and activities in the Arctic Ocean that pertain to the *Navigation Protection Act* (NPA).
- Noted the Proponent would require approval under the NPA prior to action and a notice of works must be submitted to TC.
- Recommended the Proponent conduct a self-assessment to determine if the proposed works would be considered to be minor under the Minor Works and Waters Order and provided a website for more information: <http://www.tc.gc.ca/eng/programs-621.html>

Kugluktuk Angoniatit Association Hunters' and Trappers' Organization

- Noted no concerns but requested a final report when the project is complete.

5. Comments and Concerns with respect to Inuit Qaujimaningit, Traditional, and Community Knowledge

No concerns or comments were received with respect to Inuit Qaujimaningit or traditional and community knowledge in relation to the proposed project.

FACTORS FOR DETERMINING SIGNIFICANCE OF IMPACTS

In determining whether a review of the project is required, the Board considered whether the project proposal had potential to result in significant ecosystemic or socio-economic impacts.

Accordingly, the assessment of impact significance was based on the analysis of those factors that are set out under section 90 of the NuPPAA. The Board took particular care to take into account Inuit Qaujimaningit, traditional and community knowledge in carrying out its assessment and determination of the significance of impacts.

The following is a summary of the Board's assessment of the factors that are relevant to the determination of significant impacts with respect of this project proposal:

1. *The size of the geographic area, including the size of wildlife habitats, likely to be affected by the impacts.*

The size of the geographic area of the proposed project includes several marine study areas within the Kitikmeot region near the communities of Cambridge Bay, Kugluktuk, Taloyoak, Gjoa Haven, and the seasonal communities of Bathurst Inlet and Umingmaktok. The proposed project activities would include the use of a marine vessel to conduct research

activities and the use of an aluminum skiff to access shallow water areas. The proposed project activities would also include occasional use of aircraft to drop off scientists, materials and equipment to the Bathurst Inlet project site location. As identified by the Proponent and NPC mapping sources the proposed project activities may take place within habitats and seasonal ranges of many far-ranging marine wildlife species, marine fish, migratory birds and Species at Risk such as Eskimo Curlew. As such, the project may potentially affect animal migratory patterns. Further, part of the proposed project activities would take place within the Queen Maud Gulf Migratory Bird Sanctuary.

2. *The ecosystemic sensitivity of that area.*

The proposed project would occur in an area with no particular identified ecosystemic sensitivity with the exception of some sampling sites that would fall within the Queen Maud Gulf Migratory Bird Sanctuary. This area has been identified as having value and priority to the local communities for:

- i. Migratory birds and non-migratory birds;
- ii. Polar Bears;
- iii. Marine wildlife including various whale species;
- iv. Fish and fish habitat;
- v. Terrestrial wildlife including: caribou, muskox, wolves, grizzly bears; and
- vi. Traditional activities and Inuit harvesting.

3. *The historical, cultural and archaeological significance of that area.*

Neither the Proponent nor any parties that submitted comments for this project proposal identified any known areas of historical, cultural and archaeological significance within the proposed project area. Should the project be approved to proceed, the Proponent would be required to contact the Government of Nunavut – Department of Culture and Heritage if any sites of historical, cultural, and archaeological significance are encountered

4. *The size of the human and the animal populations likely to be affected by the impacts.*

The proposed project would occur within close proximity to several communities and these areas may be used by residents for recreational/traditional pursuits. As such, human populations are likely to be affected by project impacts and could potentially contribute to public concern developing. A term and condition has been recommended to direct engagement with the community, hunters and trappers organization and interested parties, as well as the posting of public notices to ensure residents are aware of the research activities being or to be conducted.

5. *The nature, magnitude and complexity of the impacts; the probability of the impacts occurring; the frequency and duration of the impacts; and the reversibility or irreversibility of the impacts.*

As the “Kitikmeot Region Marine Science Study” project would involve the collection of baseline oceanographic data and evaluate marine ecosystem structure in the Kitikmeot

region, the potential for adverse impacts is considered to be well-known and infrequent in occurrence. However, due to a component of the proposal occurring within an ecological sensitive area (Queen Maud Gulf Migratory Bird Sanctuary), specific mitigation measures for the protection of critical life stages of the sensitive wildlife and migratory birds may be necessary. Based on past evidence of similar scope of activities, the potential adverse impacts will be short in duration and may be of low magnitude, reversible and mitigable with due care.

6. *The cumulative impacts that could result from the impacts of the project combined with those of any other project that has been carried out, is being carried out or is likely to be carried out.*

The proposed project would take place within a 100 kilometre radius to a number of other projects that are currently active, in addition to other projects proposed and currently undergoing assessment by the Board as listed in Table 1 below. However, it is noted that this project is not likely to result in residual or cumulative impacts. The potential for cumulative impacts to marine wildlife and marine fish resulting from the research activities and other projects occurring in the region has been identified and considered in the development of the NIRB's recommendations. Terms and conditions recommended for each of these projects are expected to reduce any residual impacts, and as such would limit or eliminate the potential for cumulative effects to occur.

Table 1: Project List

| NIRB Project # | Project Title | Project Type |
|-------------------------------|--|---------------------|
| <i>Active Projects</i> | | |
| 05MN047 | Doris North Mine | Mine Development |
| 06YN071 | ArcticNet Project 1: The Northwest Passage at the end of the Last Glaciation. ArcticNet Project 2: River sampling during 2017 ArcticNet expedition | Research |
| 16AN072 | Northwest Passage Project | Tourism |
| 16UN059 | CAM-C (Matheson Point) Remediation Project | Remediation |
| 17YN002 | Towards a Sustainable Fishery for Nunavummiut (TSFN) | Research |
| 17YN008 | GEM-2 Boothia-Somerset: Integrated Geoscience Along the Northwest Passage | Research |
| 17YN018 | Coppermine River Transect | Research |
| 17AN031 | Canada C3 led by the Students on Ice Foundation | Tourism |
| 17YN041 | A Coastal, Pan-Canadian Collection of plants, microalgae and marine invertebrates for the Canadian Museum of Nature, as part of Canada C3 | Research |
| 17UN042 | CAT-TRAIN: Canadian Tidal Transect Research and Infrastructure Network. (NPC # 148452) | Research |

7. *Any other factor that the Board considers relevant to the assessment of the significance of impacts.*

No other specific factors have been identified as relevant to the assessment of this project proposal.

Views of the Board

In considering the factors as set out above in the screening of the project proposal, the NIRB has identified a number of issues below and respectfully provide the following views regarding whether or not the proposed project has the potential to result in significant impacts. In addition, the NIRB has proposed terms and conditions that would mitigate the potential adverse impacts identified.

Administrative Conditions:

To encourage compliance with applicable regulatory requirements and assist the Board and responsible authorities with compliance and effects monitoring for project activities, the following project-specific terms and conditions have been recommended: 1-4.

Ecosystem, wildlife habitat and Inuit harvesting activities:

Issue 1: Potential adverse impacts to terrestrial wildlife, marine wildlife, marine fish, migratory birds, Species at Risk and their habitat from the transportation of personnel to the proposed project sites via the *RV Martin Bergmann*, research activities, occasional use of an aircraft to transport personnel and potential increased noise associated with the research activities.

Board views: As discussed above in the assessment of factors relevant to this project proposal, the potential for impact(s) is applicable to a number of small study areas and is limited due to infrequent activities but may affect terrestrial wildlife, marine wildlife species, marine fish, migratory birds and Species at Risk. Noise generated from vessel movement and small boat operations could result in temporary auditory threshold shifts, masking of echolocation signals, including disturbance of marine wildlife, migratory birds, fish population and benthic habitats, and could subsequently result in separation of parent/pups, destruction of eggs, and decrease in size or migration of colony as well as injuries or mortality events. Further, it is unlikely that the specific areas identified by the Proponent for observation and sampling could be actively used by marine mammals; however, any resulting impacts would be expected to be temporary only. Further it is noted that a component of the research activities would occur within the Queen Maud Gulf Migratory Bird Sanctuary which could affect migratory birds.

The Proponent would require a licence from the Canadian Wildlife Service for the activities that take place within the Queen Maud Gulf Migratory Bird Sanctuary. The Proponent would also be required to follow the *Migratory Birds Convention Act*, *Migratory Birds Regulations*, *Species at Risk Act*, the *Wildlife Act (Nunavut)*, the *Arctic Waters Pollution Prevention Act*, the *Marine Liability Act*, the *Navigation Protection Act* and the *Aeronautic Act* (see Regulatory Requirements section).

Recommended Mitigation Measures: It is recommended that the potential adverse impacts may be mitigated by measures such as requiring the Proponent to employ general and species-specific measures for the protection of marine wildlife. Maintain minimum watercraft speeds and seasonal restrictions. The NIRB recommends the following terms and conditions to mitigate the potential adverse impacts to migratory and non-migratory birds and marine mammals: 6 through 19.

Issue 2: Potential negative impacts to surface water quality, marine water quality and marine ecosystems from potential fuel and chemical spills related to research activities.

Board views: The potential for impacts from the research activities and associated refuelling activities are applicable to a small geographic area and the probability of impacts occurring is considered to be low, with potential adverse effects anticipated to be low in magnitude, infrequent in occurrence and reversible in nature. In addition, fuel spills may result in potential for adverse impacts to marine water quality. The Proponent has committed to properly managing fuel and wastes for the project.

The Proponent is required to follow the *Fisheries Act*, the *Nunavut Waters and Nunavut Surface Rights and Tribunal Act*, and the *Arctic Waters Pollution Prevention Act*. (see Regulatory Requirements section).

Recommended Mitigation Measures: It is recommended that operational procedures for the transfer of fuel and chemicals, and spill response equipment would reduce the risk of uncontrolled releases of fuel or hazardous materials resulting in adverse impacts to the surface water quality, marine water quality and marine ecosystems. The following terms and conditions are recommended to mitigate the potential adverse impacts from fuel use, and the potential for unintended spills to waterbodies: 5, and 20 through 22.

Issue 3: Potential adverse impacts to public and traditional land use activities in the area due to research activities, and small boat operations.

Board Views: The Proponent has indicated that the proposed research activities would take place within waters near various communities within the Kitikmeot region with a component of the research activities occurring within the Queen Maud Gulf Migratory Bird Sanctuary. Due to the site's close proximity to seasonal home ranges and migration routes of both terrestrial wildlife and marine mammal species, it is possible that wildlife avoidance may temporarily change the distribution of several wildlife species commonly harvested in the area, which may in turn affect personal enjoyment of the land. Terms and conditions have been recommended to minimize adverse impacts to traditional land use activities, and by ensuring ongoing consultation with the community and community organizations.

Recommended Mitigation Measures: Term and condition 23 is recommended to ensure that the affected communities and organizations are informed about the project proposal and term and condition 24 has been recommended to ensure that project activities do not

interfere with Inuit wildlife harvesting or traditional land use activities in the area. In addition, terms and conditions 7 through 13 have been recommended to minimize interference with the movements of terrestrial wildlife and nesting/breeding birds.

Socio-economic effects on northerners:

Issue 4: Potential adverse impacts to historical, cultural, and archaeological sites from research activities.

Board Views: The Proponent is proposing to work in an area of no known historical significance which may cause potential negative impacts. The Proponent is required to contact the Government of Nunavut – Department of Culture and Heritage when encountering historical sites and is required to follow the *Nunavut Act* (as recommended in Regulatory Requirements section).

Recommended Mitigation Measures: Term and condition 23 is recommended to ensure that available Inuit Qaujimaningit can inform project activities, and reduce the potential for negative impacts occurring to any historical sites.

Issue 5: Potential positive impacts to the local community from the sourcing of accommodations for personnel within the community and purchasing of local goods and services.

Board Views: It is noted that the Proponent has committed to staying at the local hotel and the Canadian High Arctic Research Station accommodations in Cambridge Bay. In addition, the Proponent has committed to the purchasing of local goods and services and to source accommodations within Cambridge Bay which would allow the community to increase income and expenditures within the community.

Recommended Mitigation Measures: Terms and conditions 24 and 25 have been recommended to ensure the Proponent continues to inform the community of the research activities and findings as well as provide community members with information to ensure a successful local hiring opportunity.

Significant public concern:

Issue 6: No significant public concern was expressed during the public commenting period for this file.

Board Views: Follow up consultation and involvement of local community members is expected to mitigate any potential for public concern resulting from project activities. The Proponent has committed to consult with local community members on the results of the scientific research. In addition, it is recommended that the Proponent considers hiring local people for the project activities.

Recommended Mitigation Measures: Term and condition 23 is recommended to ensure that the affected community and organizations are informed about the project proposal, and to

provide the Proponent with an opportunity to proactively address or mitigate any concerns that may arise from the project activities findings. Term and condition 25 is recommended to ensure that the Proponent provide community members with information to ensure a successful local hiring opportunity.

Technological innovations for which the effects are unknown:

No specific issues have been identified associated with this project proposal.

In considering the above factors and subject to the Proponent's compliance with the terms and conditions necessary to mitigate against the potential adverse environmental and social effects, the Board is of the view that the proposed project is unlikely to cause significant public concern and its adverse ecosystemic and socioeconomic impacts are unlikely to be significant, or are highly predictable and can be adequately mitigated by known technologies.

RECOMMENDED PROJECT-SPECIFIC TERMS AND CONDITIONS

The Board is recommending the following specific terms and conditions to apply in respect of the project:

General

1. Fisheries and Oceans Canada (the Proponent) shall maintain a copy of the Project Terms and Conditions at the site of operation at all times.
2. The Proponent shall forward copies of all permits obtained and required for this project to the Nunavut Impact Review Board (NIRB) prior to the commencement of the project.
3. The Proponent shall operate in accordance with all commitments stated in correspondence provided to the Nunavut Planning Commission (Application to Determine Conformity, June 12, 2017), and the NIRB (Online Application Form, July 11, 2017; Additional Information regarding Float Plane Usage, July 14, 2017).
4. The Proponent shall operate the site in accordance with all applicable Acts, Regulations and Guidelines.

Water Use

5. The Proponent shall ensure that water extraction from any fish-bearing waterbody is done with appropriate care and caution. Small lakes or streams should not be used for water withdrawal unless approved by the Nunavut Water Board.

Waste Disposal

6. The Proponent shall keep all garbage and debris in bags placed in a covered metal container or equivalent until disposed of at an approved facility. All such wastes shall be kept inaccessible to wildlife at all times.

Wildlife - General

7. The Proponent shall ensure that there is no damage to wildlife habitat in conducting this operation.

8. The Proponent shall not harass wildlife. This includes persistently circling, chasing, hovering over pursuing or in any other way harass wildlife, or disturbing large groups of animals.
9. The Proponent shall not hunt or fish, unless proper Nunavut authorizations have been acquired.
10. The Proponent shall ensure that all project personnel are made aware of the measures to protect wildlife and are provided with training and/or advice on how to implement these measures.

Migratory Birds and Raptors Disturbance

11. The Proponent shall not disturb or destroy the nests or eggs of any birds. If nests are encountered and/or identified, the Proponent shall take precaution to avoid further interaction and or disturbance (e.g., a 100 metres buffer around the nests). If active nests of any birds are discovered (i.e., with eggs or young), the Proponent shall avoid these areas until nesting is complete and the young have left the nest.
12. The Proponent shall minimize activities during periods when birds are particularly sensitive to disturbance such as migration, nesting, and moulting.
13. The Proponent shall avoid the seaward site of seabird colonies and areas used by flocks of migrating waterfowl by three (3) kilometres.
14. The Proponent shall ensure its aircraft avoid excessive hovering or circling over areas where bird presence is likely.

Aircraft Flight Restrictions

15. The Proponent shall not alter flight paths to approach wildlife, and avoid flying directly over animals.
16. The Proponent shall restrict aircraft/helicopter activity related to the project to a minimum flight altitude of 610 metres above ground level unless except during landing, take-off or if there is a specific requirement for low-level flying, which does not disturb wildlife or migratory birds.
17. The Proponent shall ensure that aircraft maintain a vertical distance of 1000 metres and a horizontal distance of 1500 metres from any observed groups (colonies) of migratory birds. Aircraft should avoid critical and sensitive wildlife areas at all times by choosing alternate flight corridors.
18. The Proponent shall ensure that aircraft/helicopter do not, unless for emergency, touch-down in areas where wildlife are present.
19. The Proponent shall advise all pilots of relevant flight restrictions and enforce their application over the project area, including flight paths to/from the project area.

Restoration of Disturbed Areas

20. The Proponent shall remove all garbage, fuel and equipment upon abandonment.

Ship-based Research Activities

21. The Proponent shall not deposit, nor permit the deposit of any fuel, chemicals, wastes (including waste water) or sediment into any marine waters, and shall manage wastes on board the vessel prior to final disposal at approved port facilities.
22. The Proponent shall ensure that all personnel are properly trained in fuel and hazardous waste handling procedures, as well as spill response procedures. All spills of fuel or other deleterious materials of any amount must be reported immediately to the 24 hour Spill Line at (867) 920-8130.

Other

23. The Proponent should consult with local residents regarding their activities in the area and solicit available Inuit Qaujimaningit and information that can inform project activities.
24. The Proponent shall ensure that project activities do not interfere with Inuit wildlife harvesting or traditional land use activities.
25. The Proponent should, to the extent possible, hire local people and access local services where possible.

REPORTING REQUIREMENTS

In addition, the Board is recommending the following:

The Proponent shall submit an annual update on the research activities to the Kugluktuk Angoniatit Association Hunters' and Trappers' Organization and upon completion of the project a final report.

OTHER NIRB CONCERNS AND RECOMMENDATIONS

In addition to the project-specific terms and conditions, the Board is recommending the following:

Change in Project Scope

1. Responsible authorities or Proponent shall notify the Nunavut Planning Commission (NPC) and the NIRB of any changes in operating plans or conditions, including phase advancement, associated with this project prior to any such change.

Bear and Carnivore Safety

2. The Proponent should review the Government of Nunavut's booklet on Bear Safety, which can be downloaded from this link: http://gov.nu.ca/sites/default/files/bear_safety_-_reducing_bear-people_conflicts_in_nunavut.pdf. Further information on bear/carnivore detection and deterrent techniques can be found in the "Safety in Grizzly and Black Bear Country" pamphlet, which can be downloaded from this link: http://www.enr.gov.nt.ca/sites/default/files/web_pdf_wd_bear_safety_brochure_1_may_2015.pdf.
3. There are Polar Bear and grizzly bear safety resources available from the Bear Smart Society with videos on polar bear safety available in English, French, and Inuktitut at

<http://www.bearsmart.com/play/safety-in-polar-bear-country/>. Information can also be obtained from Parks Canada's website on bear safety at the following link: <http://www.pc.gc.ca/eng/pn-np/nu/quttinirpaaq/visit/visit6/d.aspx> or in reviewing the "Safety in Polar Bear Country" pamphlet, which can be downloaded from the following link: http://www.pc.gc.ca/eng/pn-np/nu/quttinirpaaq/visit/visit6/~media/pn-np/nu/auyuittuq/pdf/shared/PolarBearSafety_English.ashx.

4. Any problem wildlife or any interaction with carnivores should be reported immediately to the local Government of Nunavut, Department of Environment Conservation Office (Conservation Officer of Cambridge Bay, phone: (867) 983-4614).

Species at Risk

5. The Proponent review Environment and Climate Change Canada's "Environment Assessment Best Practice Guide for Wildlife at Risk in Canada", available at the following link: http://www.sararegistry.gc.ca/virtual_sara/files/policies/EA%20Best%20Practices%202004.pdf. The guide provides information to the Proponent on what is required when Wildlife at Risk, including *Species at Risk*, are encountered or affected by the project.

Migratory Birds

6. The Proponent review Canadian Wildlife Services' "Key migratory bird terrestrial habitat sites in the Northwest Territories and Nunavut", available at the following link: <http://publications.gc.ca/site/eng/317630/publication.html> and "Key marine habitat sites for migratory birds in Nunavut and the Northwest Territories", available at the following link: <http://publications.gc.ca/site/eng/392824/publication.html>. The guide provides information to the Proponent on key terrestrial and marine habitat areas that are essential to the welfare of various migratory bird species in Canada.
7. For further information on how to protect migratory birds, their nests and eggs when planning or carrying out project activities, consult Environment and Climate Change Canada's Incidental Take web page and the fact sheet "Planning Ahead to Reduce the Risk of Detrimental Effects to Migratory Birds, and their Nests and Eggs" available at <http://www.ec.gc.ca/paom-itmb/>.

REGULATORY REQUIREMENTS

The Proponent is also advised that the following legislation may apply to the project:

Acts and Regulations

1. The *Fisheries Act* (<http://laws-lois.justice.gc.ca/eng/acts/F-14/index.html>).
2. The *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (<http://laws-lois.justice.gc.ca/eng/acts/n-28.8/>).
3. The *Migratory Birds Convention Act* and *Migratory Birds Regulations* (<http://laws-lois.justice.gc.ca/eng/acts/M-7.01/>).
4. The *Species at Risk Act* (<http://laws-lois.justice.gc.ca/eng/acts/S-15.3/index.html>). Attached in **Appendix A** is a list of Species at Risk in Nunavut.

5. The *Wildlife Act* (Nunavut) and its corresponding regulations (<http://www.canlii.org/en/nu/laws/stat/snu-2003-c-26/latest/snu-2003-c-26.html>) contains provisions to protect and conserve wildlife and wildlife habitat, including specific protection measures for wildlife habitat and species at risk.
6. The *Nunavut Act* (<http://laws-lois.justice.gc.ca/eng/acts/N-28.6/>). The Proponent must comply with the proposed terms and conditions listed in the attached **Appendix B**.
7. The *Aeronautics Act* (<http://laws-lois.justice.gc.ca/eng/acts/A-2/>).
8. The *Arctic Waters Pollution Prevention Act* (<http://laws-lois.justice.gc.ca/eng/acts/A-12/>).
9. The *Marine Liability Act* (<http://laws-lois.justice.gc.ca/eng/acts/M-0.7/>).
10. The *Navigation Protection Act* (<http://laws-lois.justice.gc.ca/eng/acts/N-22/index.html>).

CONCLUSION

The foregoing constitutes the Board's screening decision with respect to the Fisheries and Oceans Canada's "Kitikmeot Region Marine Science Study". The NIRB remains available for consultation with the Minister regarding this report as necessary.

Dated August 16, 2017 at Whale Cove, NU.



Elizabeth Copland, Chairperson

Attachments: Appendix A: Species at Risk in Nunavut
 Appendix B: Archaeological and Palaeontological Resources Terms and Conditions for Land Use
 Permit Holders

Appendix A

Species at Risk in Nunavut

Due to the requirements of Section 79(2) of the Species At Risk Act (SARA), and the potential for project-specific adverse effects on listed wildlife species and its critical habitat, measures should be taken as appropriate to avoid or lessen those effects, and the effects need to be monitored. Project effects could include species disturbance, attraction to operations and destruction of habitat. This section applies to all species listed on Schedule 1 of SARA, as listed in the table below, or have been assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), which may be encountered in the project area. This list may not include all species identified as at risk by the Territorial Government. The following points provide clarification on the applicability of the species outlined in the table.

- Schedule 1 is the official legal list of Species at Risk for SARA. SARA applies to all species on Schedule 1. The term “listed” species refers to species on Schedule 1.
- Schedule 2 and 3 of SARA identify species that were designated at risk by the COSEWIC prior to October 1999 and must be reassessed using revised criteria before they can be considered for addition to Schedule 1.
- Some species identified at risk by COSEWIC are “pending” addition to Schedule 1 of SARA. These species are under consideration for addition to Schedule 1, subject to further consultation or assessment.

If species at risk are encountered or affected, the primary mitigation measure should be avoidance. The Proponent should avoid contact with or disturbance to each species, its habitat and/or its residence. All direct, indirect, and cumulative effects should be considered. Refer to species status reports and other information on the species at risk Registry at <http://www.sararegistry.gc.ca> for information on specific species.

Monitoring should be undertaken by the Proponent to determine the effectiveness of mitigation and/or identify where further mitigation is required. As a minimum, this monitoring should include recording the locations and dates of any observations of species at risk, behaviour or actions taken by the animals when project activities were encountered, and any actions taken by the proponent to avoid contact or disturbance to the species, its habitat, and/or its residence. This information should be submitted to the appropriate regulators and organizations with management responsibility for that species, as requested.

For species primarily managed by the Territorial Government, the Territorial Government should be consulted to identify other appropriate mitigation and/or monitoring measures to minimize effects to these species from the project.

Mitigation and monitoring measures must be undertaken in a way that is consistent with applicable recovery strategies and action/management plans.

Schedules of SARA are amended on a regular basis so it is important to check the SARA registry (www.sararegistry.gc.ca) to get the current status of a species.

Updated: October 2016

| Terrestrial Species at Risk ¹ | COSEWIC Designation | Schedule of SARA | Government Organization with Primary Management Responsibility ² |
|--|---|---|---|
| Migratory Birds | | | |
| Eskimo Curlew | Endangered | Schedule 1 | EC |
| Buff-breasted Sandpiper | Special concern | Pending | EC |
| Ivory Gull | Endangered | Schedule 1 | EC |
| Ross's Gull | Threatened | Schedule 1 | EC |
| Harlequin Duck (Eastern population) | Special Concern | Schedule 1 | EC |
| Rusty Blackbird | Special Concern | Schedule 1 | Government of Nunavut |
| Peregrine Falcon | Special Concern (<i>anatum-tundrius</i> complex ³) | Schedule 1 - Threatened (<i>anatum</i>) Schedule 3 – Special Concern (<i>tundrius</i>) | Government of Nunavut |
| Short-eared Owl | Special Concern | Schedule 1 | Government of Nunavut |
| Red Knot (<i>rufa</i> subspecies) | Endangered | Schedule 1 | EC |
| Red Knot (<i>islandica</i> subspecies) | Special Concern | Schedule 1 | EC |
| Horned Grebe (Western population) | Special Concern | Pending | EC |
| Red-necked Phalarope | Special concern | Pending | EC |
| Vegetation | | | |
| Felt-leaf Willow | Special Concern | Schedule 1 | Government of Nunavut |
| Blanket-leaved Willow | Special Concern | Schedule 1 | Government of Nunavut |
| Porsild's Bryum (Moss) | Threatened | Schedule 1 | Government of Nunavut |
| Terrestrial Wildlife | | | |
| Peary Caribou | Endangered | Schedule 1 | Government of Nunavut |
| Peary Caribou (High Arctic Population) | Endangered | Schedule 2 | Government of Nunavut |
| Peary Caribou (Low Arctic Population) | Threatened | Schedule 2 | Government of Nunavut |
| Dolphin and Union Caribou | Special Concern | Schedule 1 | Government of Nunavut |
| Grizzly Bear (Western Population) | Special Concern | Pending | Government of Nunavut |
| Wolverine | Special Concern | Pending | Government of Nunavut |
| Marine Wildlife | | | |
| Polar Bear | Special Concern | Schedule 1 | Government of Nunavut/DFO |
| Atlantic Walrus | Special Concern | Pending | DFO |
| Beluga Whale (Cumberland Sound population) | Threatened | Pending | DFO |
| Beluga Whale (Eastern Hudson Bay population) | Endangered | Pending | DFO |
| Beluga Whale (Western Hudson Bay population) | Special Concern | Pending | DFO |
| Beluga Whale (Eastern High Arctic – Baffin Bay population) | Special Concern | Pending | DFO |
| Bowhead Whale (Eastern Canada – West | Special Concern | Pending | DFO |

| | | | |
|--|-----------------|------------|-----|
| Greenland population) | | | |
| Bowhead Whale (Eastern Arctic population) | Endangered | Schedule 2 | DFO |
| Killer Whale (Northwest Atlantic / Eastern Arctic populations) | Special Concern | Pending | DFO |
| Grey Whale (Eastern North Pacific population) | Special Concern | Schedule 1 | DFO |
| Humpback Whale (Western North Atlantic population) | Special Concern | Schedule 3 | DFO |
| Narwhal | Special Concern | Pending | DFO |
| Fish | | | |
| Northern Wolffish | Threatened | Schedule 1 | DFO |
| Atlantic Wolffish | Special Concern | Schedule 1 | DFO |
| Bering Wolffish | Special Concern | Schedule 3 | DFO |
| Fourhorn Sculpin | Special Concern | Schedule 3 | DFO |
| Roundnose Grenadier | Endangered | Pending | DFO |
| Spotted Wolffish | Threatened | Schedule 1 | DFO |
| Thorny Skate | Special Concern | Pending | DFO |
| Atlantic Cod, Arctic Lakes | Special Concern | Pending | DFO |
| Blackline Prickleback | Special Concern | Schedule 3 | DFO |

¹ The Department of Fisheries and Oceans has responsibility for aquatic species.

² Environment Canada (EC) has a national role to play in the conservation and recovery of Species at Risk in Canada, as well as responsibility for management of birds described in the Migratory Birds Convention Act (MBCA). Day-to-day management of terrestrial species not covered in the MBCA is the responsibility of the Territorial Government. Populations that exist in National Parks are also managed under the authority of the Parks Canada Agency.

³ The *anatum* subspecies of Peregrine Falcon is listed on Schedule 1 of SARA as threatened. The *anatum* and *tundrius* subspecies of Peregrine Falcon were reassessed by COSEWIC in 2007 and combined into one subpopulation complex. This subpopulation complex was assessed by COSEWIC as Special Concern.

Appendix B Archaeological and Palaeontological Resources Terms and Conditions for Land Use Permit Holders



INTRODUCTION

The Department of Culture and Heritage (CH) routinely reviews land use applications sent to the Nunavut Water Board, Nunavut Impact Review Board and the Indigenous and Northern Affairs Canada. These terms and conditions provide general direction to the permittee/proponent regarding the appropriate actions to be taken to ensure the permittee/proponent carries out its role in the protection of Nunavut's archaeological and palaeontological resources.

TERMS AND CONDITIONS

- 1) The permittee/proponent shall have a professional archaeologist and/or palaeontologist perform the following **Functions** associated with the **Types of Development** listed below or similar development activities:

| | Types of Development (See Guidelines below) | Function (See Guidelines below) |
|----|---|--|
| a) | Large scale prospecting | Archaeological/Palaeontological Overview Assessment |
| b) | Diamond drilling for exploration or geotechnical purpose or planning of linear disturbances | Archaeological/ Palaeontological Inventory |
| c) | Construction of linear disturbances, Extractive disturbances, Impounding disturbances and other land disturbance activities | Archaeological/ Palaeontological Inventory or Assessment or Mitigation |

Note that the above-mentioned functions require either a Nunavut Archaeologist Permit or a Nunavut Palaeontologist Permit. CH is authorized by way of the *Nunavut and Archaeological and Palaeontological Site Regulations*¹ to issue such permits.

- 2) The permittee/proponent shall not operate any vehicle over a known or suspected archaeological or palaeontological site.

¹ P.C. 2001-1111 14 June, 2001

- 3) The permittee/proponent shall not remove, disturb, or displace any archaeological artifact or site, or any fossil or palaeontological site.
- 4) The permittee/proponent shall immediately contact CH at (867) 934-2046 or (867) 975-5500 should an archaeological site or specimen, or a palaeontological site or fossil, be encountered or disturbed by any land use activity.
- 5) The permittee/proponent shall immediately cease any activity that disturbs an archaeological or palaeontological site encountered during the course of a land use operation until permitted to proceed with the authorization of CH.
- 6) The permittee/proponent shall follow the direction of CH in restoring disturbed archaeological or palaeontological sites to an acceptable condition. If these conditions are attached to either a Class A or B Permit under the Territorial Lands Act Indigenous and Northern Affairs Canada directions will also be followed.
- 7) The permittee/proponent shall provide all information requested by CH concerning all archaeological sites or artifacts and all palaeontological sites and fossils encountered in the course of any land use activity.
- 8) The permittee/proponent shall make best efforts to ensure that all persons working under its authority are aware of these conditions concerning archaeological sites and artifacts and palaeontological sites and fossils.
- 9) If a list of recorded archaeological and/or palaeontological sites is provided to the permittee/proponent by CH as part of the review of the land use application the permittee/proponent shall avoid the archaeological and/or palaeontological sites listed.
- 10) Should a list of recorded sites be provided to the permittee/proponent, the information is provided solely for the purpose of the proponent's land use activities as described in the land use application, and must otherwise be treated confidentially by the proponent.

Legal Framework

As stated in Article 33 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada* (Nunavut Agreement):

Where an application is made for a land use permit in the Nunavut Settlement Area, and there are reasonable grounds to believe that there could be sites of archaeological importance on the lands affected, no land use permit shall be issued without written consent of the Designated Agency. Such consent shall not be unreasonably withheld. [33.5.12]

Each land use permit referred to in Section 33.5.12 shall specify the plans and methods of archeological site protection and restoration to be followed by the permit holder, and any other conditions the Designated Agency may deem fit. [33.5.13]

Palaeontology and Archaeology

Under the *Nunavut Act*², the federal government can make regulations for the protection, care and preservation of palaeontological and archaeological sites and specimens in Nunavut. Under

² s. 51(1)

the *Nunavut Archaeological and Palaeontological Sites Regulations*³, it is illegal to alter or disturb any palaeontological or archaeological site in Nunavut unless permission is first granted through the permitting process.

Definitions

As defined in the *Nunavut Archaeological and Palaeontological Sites Regulations*, the following definitions apply:

“archaeological site” means a place where an archaeological artifact is found.

“archaeological artifact” means any tangible evidence of human activity that is more than 50 years old and in respect of which an unbroken chain of possession or regular pattern of usage cannot be demonstrated, and includes a Denesuline archaeological specimen referred to in section 40.4.9 of the Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada (Nunavut Agreement).

“palaeontological site” means a site where a fossil is found.

“fossil” includes:

Fossil means the hardened or preserved remains or impression of previously living organisms or vegetation and includes:

- (a) natural casts;*
- (b) preserved tracks, coprolites and plant remains; and*
- (c) the preserved shells and exoskeletons of invertebrates and the preserved eggs, teeth and bones of vertebrates.*

Guidelines for Developers for the Protection of Archaeological Resources in the Nunavut Territory

(Note: Partial document only, complete document at: www.ch.gov.nu.ca/en/Archaeology.aspx)

Introduction

The following guidelines have been formulated to ensure that the impacts of proposed developments upon heritage resources are assessed and mitigated before ground surface altering activities occur. Heritage resources are defined as, but not limited to, archaeological and historical sites, burial grounds, palaeontological sites, historic buildings and cairns. Effective collaboration between the developer, the Department of Culture, and Heritage (CH), and the contract archaeologist(s) will ensure proper preservation of heritage resources in the Nunavut Territory. The roles of each are briefly described.

CH is the Nunavut Government agency which oversees the protection and management of heritage resources in Nunavut, in partnership with land claim authorities, regulatory agencies, and the federal government. Its role in mitigating impacts of developments on heritage resources is as follows: to identify the need for an impact assessment and make recommendations to the appropriate regulatory agency; set the terms of reference for the study depending upon the scope of the development; suggest the names of qualified individuals

³ P.C. 2001-1111 14 June, 2001

prepared to undertake the study to the developer; issue an archaeologist or palaeontologist permit authorizing field work; assess the completeness of the study and its recommendations; and ensure that the developer complies with the recommendations.

The primary regulatory agencies that CH provides information and assistance to are the Nunavut Impact Review Board, for development activities proposed for Inuit Owned Lands (as defined in Section 1.1.1 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada* (Nunavut Agreement)), and the Indigenous and Northern Affairs Canada, for development activities proposed for federal Crown Lands.

A developer is the initiator of a land use activity. It is the obligation of the developer to ensure that a qualified archaeologist or palaeontologist is hired to perform the required study and that provisions of the contract with the archaeologist or palaeontologist allow permit requirements to be met; i.e. fieldwork, collections management, artifact and specimen conservation, and report preparation. On the recommendation of the contract archaeologist or palaeontologist in the field and the Government of Nunavut, the developer shall implement avoidance or mitigative measures to protect heritage resources or to salvage the information they contain through excavation, analysis, and report writing. The developer assumes all costs associated with the study in its entirety.

Through his or her active participation and supervision of the study, the contract archaeologist or palaeontologist is accountable for the quality of work undertaken and the quality of the report produced. Facilities to conduct fieldwork, analysis, and report preparation should be available to this individual through institutional, agency, or company affiliations. Responsibility for the curation of objects recovered during field work while under study and for documents generated in the course of the study as well as remittance of artifacts, specimens and documents to the repository specified on the permit accrue to the contract archaeologist or palaeontologist. This individual is also bound by the legal requirements of the *Nunavut Archaeological and Palaeontological Sites Regulations*.

Types of Development

In general, those developments that cause concern for the safety of heritage resources will include one or more of the following kinds of surface disturbances. These categories, in combination, are comprehensive of the major kinds of developments commonly proposed in Nunavut. For any single development proposal, several kinds of these disturbances may be involved

- *Linear disturbances: including the construction of highways, roads, winter roads, transmission lines, and pipelines;*
- *Extractive disturbances: including mining, gravel removal, quarrying, and land filling;*
- *Impoundment disturbances: including dams, reservoirs, and tailings ponds;*
- *Intensive land use disturbances: including industrial, residential, commercial, recreational, and land reclamation work, and use of heritage resources as tourist developments.*

- *Mineral, oil and gas exploration: establishment of camps, temporary airstrips, access routes, well sites, or quarries all have potential for impacting heritage resources.*

Types of Studies Undertaken to Preserve Heritage Resources

Overview: An overview study of heritage resources should be conducted at the same time as the development project is being designed or its feasibility addressed. They usually lack specificity with regard to the exact location(s) and form(s) of impact and involve limited, if any, field surveys. Their main aim is to accumulate, evaluate, and synthesize the existing knowledge of the heritage of the known area of impact. The overview study provides managers with baseline data from which recommendations for future research and forecasts of potential impacts can be made. A Class I Permit is required for this type of study if field surveys are undertaken.

Reconnaissance: This is done to provide a judgmental appraisal of a region sufficient to provide the developer, the consultant, and government managers with recommendations for further development planning. This study may be implemented as a preliminary step to inventory and assessment investigations except in cases where a reconnaissance may indicate a very low or negligible heritage resource potential. Alternately, in the case of small-scale or linear developments, an inventory study may be recommended and obviate the need for a reconnaissance.

The main goal of a reconnaissance study is to provide baseline data for the verification of the presence of potential heritage resources, the determination of impacts to these resources, the generation of terms of reference for further studies and, if required, the advancement of preliminary mitigative and compensatory plans. The results of reconnaissance studies are primarily useful for the selection of alternatives and secondarily as a means of identifying impacts that must be mitigated after the final siting and design of the development project. Depending on the scope of the study, a Class 1 or Class 2 Permit is required for this type of investigation.

Inventory: A resource inventory is generally conducted at that stage in a project's development at which the geographical area(s) likely to sustain direct, indirect, and perceived impacts can be well defined. This requires systematic and intensive fieldwork to ascertain the effects of all possible and alternate construction components on heritage resources. All heritage sites must be recorded on Government of Nunavut Site Survey forms. Sufficient information must be amassed from field, library and archival components of the study to generate a predictive model of the heritage resource base that will:

- allow the identification of research and conservation opportunities;
- enable the developer to make planning decisions and recognize their likely effects on the known or predicted resources; and
- make the developer aware of the expenditures, which may be required for subsequent studies and mitigation. A Class 1 or 2 permit is required.

Assessment: At this stage, sufficient information concerning the numbers and locations of heritage resources will be available, as well as data to predict the forms and magnitude of impacts. Assessments provide information on the size, volume, complexity and content of a

heritage resource, which is used to rank the values of different sites or site types given current archaeological knowledge. As this information will shape subsequent mitigation program(s), great care is necessary during this phase.

Mitigation: This refers to the amelioration of adverse impacts to heritage resources and involves the avoidance of impact through the redesign or relocation of a development or its components; the protection of the resource by constructing physical facilities; or, the scientific investigation and recovery of information from the resource by excavation or other method. The type(s) of appropriate mitigative measures are dictated by their viability in the context of the development project. Mitigation strategies must be developed in consultation with, and approved by, the Department of Culture and Heritage. It is important to note that mitigation activities should be initiated as far in advance of the construction of the development as possible.

Surveillance and monitoring: These may be required as part of the mitigation program.

Surveillance may be conducted during the construction phase of a project to ensure that the developer has complied with the recommendations.

Monitoring involves identification and inspection of residual and long-term impacts of a development (i.e. shoreline stability of a reservoir); or the use of impacts to disclose the presence of heritage resources, for example, the uncovering of buried sites during the construction of a pipeline.