NIRB Application for Screening #126177

Impacts of Past Glacial Ice Sheets

Application Type:	New
Project Type:	Scientific Research
Application Date:	Monday, April 28, 2025
Period of operation:	from 2025-07-29 to 2025-08-12
Project Proponent:	Pierre-Marc Godbout Geological Survey of Canada - Natural Resources Canada 601 Booth Street Ottawa Ontario K1A0E8 Canada Phone Number:: 4388815307, Fax Number::

DETAILS

Non-technical project proposal description

English: The Impacts of Past Glacial Ice Sheets study aims to deepen our understanding of how a large ice sheet moved and shaped the landscape during the last glaciation, as well as how the land is still slowly rising and adjusting now that the ice's immense weight is gone. This research will further investigate how the ice sheet transported and deposited minerals from their original, unknown source to new locations, and will provide valuable information to support future land use studies. The research team involved in this study has recently completed two years of fieldwork under the Keewatin Glacial Dynamics study in an area south of Dubawnt Lake. They propose to continue this work with a new field study area west of Baker Lake, complemented by a larger regional-scale remote study. To support these interpretations, the team will conduct remotely-based research using specialized tools, such as high-resolution satellite imagery, and analyze archived samples to track these mineral movements across the region. The research team is seeking to carry out the fieldwork portion of this study over 2-3 weeks between the end of July and mid-August 2025. The team would consist of four researchers and a wildlife monitor, travelling daily from Baker Lake by helicopter to study sites of interest. One fuel cache of up to 15 drums will be needed for this work within the field study area. While on the land, the team would collect fist-sized samples of rocks, and buckets of glacial sediments (till) dug by hand from small holes, as well as record observations, photographs and measurements of landscape features created by glaciers. All data will be published in geodatabase and shapefile formats on the NRCan Open Geoscience Portal. In-person meetings were held in Baker Lake in February 2025 to present the proposed research, and the final results will be shared with the engaged communities and organizations through digital, print, and in-person updates, although the full study conclusions may take several years.

French: N/A

Inuktitut: ᐊᒃᑐᖅᓯᓃᑦ ᑕᐃᑉᓱᒪᓂᒥᑦ ᓯᕐᒥᓕᕐᓂᑦ ᓱᑯᓪᓚᕐᓂᑦ ᐱᔪᓂᒃ ᖃᐅᔨᓴᐃᓂᖅ ᑐᑭᓯᐊᓕᒃᑲᓐᓂᕈᒪᐸᓗᒋᑦ ᖃᓄᖅ ᓱᑯᐃᑦ ᐊᖏᑎᕆᔪᒥᑦ ᐊᐅᓚᔅᓴᒃᓯᒪᖕᒪᖔᑕ ᐊᒻᒪᓗ ᐋᖅᑭᒃᑕᐅᔪᑦ ᓄᓇᐅᑉ ᐋᖅᑭᐅᒪᓂᖓᓄᑦ ᑭᖑᓪᓕᖅᐹᒥᑦ ᓯᕐᒥᓕᕐᓂᑦ, ᐊᒻᒪᓗ ᖃᓄᖅ ᓄᓇ ᓱᑲᐃᑦᑐᒥᒃ ᕿᑦᑎᒃᓯᕙᓪᓕᐊᖕᒪᖔᑦ ᐊᒻᒪᓗ ᐋᖅᑭᒃᐸᓪᓕᐊᑉᓗᓂ ᓯᑯ ᐅᕐᑯᒪᐃᓐᓂᐊᓗᖓ ᐱᑕᖃᕈᓐᓃᖅᑎᓪᓗᒍ. ᖃᐅᔨᓴᐃᓂᕐᒥᑦ ᖃᐅᔨᓴᐃᒃᑲᓐᓂᕐᓂᐊᖅᑐᑦ ᖃᓄᖅ ᓱᑯᐃᑦ ᐊᖁᖅᓯᓯᒪᖕᒪᖔᑕ ᐊᒻᒪᓗ ᐃᓕᑉᓗᑎᑦ ᐅᔾᖅᑲᐃᑦ ᐃᓂᒋᖅᑲᐅᑕᐅᓚᐅᖅᑕᖕᒐᓂᑦ, ᖃᐅᔨᒪᔭᐅᖏᑦᑐᓄᑦ ᓄᑖᓄᑦ ᐃᓂᐅᔪᓄᑦ, ᐊᒻᒪᓗ ᐱᒻᒪᕆᐅᔪᒥᒃ ᑐᑭᓯᐅᒪᔾᔪᑎᖃᖅᑎᑦᑎᓂᐊᖅᑐᖅ ᐃᑲᔪᖅᑐᓂᖅ ᓯᕗᓂᒃᓴᒥᑦ ᓄᓇᒥᒃ ᐊᑐᕐᓂᕐᒧᑦ ᖃᐅᔨᐃᓴᓂᕐᓄᑦ.ᖃᐅᔨᓴᐃᔩᑦ ᐃᓚᐅᔪᑦ ᖃᐅᔨᓴᐃᓐᓂᓵᓚᐅᖅᑐᑦ ᒪᕐᕉᒃ ᐅᑭᐅᓂᑦ Keewatin Glacial Dynamics-ᒥᑦ (ᑭᕙᓪᓕᕐᒥᑦ ᓯᕐᒦᑦ ᖃᓄᐃᓕᐅᕐᓂᖏᑦ) ᐃᓂᐅᔪᒥᑦ ᓂᑎᐊᓂᑦ ᑐᓕᒫᔅᔪᐊᑉ. ᐱᓕᕆᐊᖅ ᑲᔪᓯᑎᑦᑐᒪᔭᖕᖔᑦ ᓄᑖᒥᒃ ᖃᐅᔨᓴᐃᕝᕕᐅᓂᐊᖅᑐᒥᑦ ᖃᒪᓂᑦᑐᐊᑉ ᓂᑎᐊᓂᑦ, ᐊᖏᓂᖅᓴᐅᔪᒥᒃ ᐃᓂᐅᔫᑉ ᐊᖏᑎᕆᓂᖔᓂᑦ ᐅᖓᓯᒃᑐᒥᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᒥᑦ. ᐃᑲᔪᕐᓂᐊᕐᓗᒋᑦ ᑐᑭᓕᐅᖅᓯᒪᔪᑦ, ᐱᓕᕆᔪᑦ ᐅᖓᓯᒃᑑᒦᖓᓗᑎᒃ ᖃᐅᔨᓴᐃᓂᐊᖅᑐᑦ ᐊᑐᕐᓗᑎᒃ ᐊᔾᔨᐅᖏᑦᑐᓕᐅᖅᓯᒪᔪᓂᒃ ᐊᑐᖅᑕᐅᔪᓂᒃ, ᓵᕐᓗ ᑕᑯᒃᓴᐅᓂᖃᑦᑎᐊᖅᑐᓂᑦ ᖃᖓᑦᑕᖅᑎᑕᐅᓯᒪᔪᒥᙵᖅᑐᓂᑦ ᐊᔾᔨᓂᑦ, ᐊᒻᒪᓗ ᖃᐅᔨᓴᕐᓗᒋᑦ ᑐᖅᑯᖅᓯᒪᔪᑦ ᐆᒃᑐᕋᕈᑏᑦ ᐅᔾᖅᑲᐃᑦ ᐊᐅᓚᔅᓴᓐᓂᖏᑦ ᐃᓂᐅᔪᒥᑦ.ᖃᐅᔨᓴᐃᔩᑦ ᐱᓕᕆᐊᖃᒃᑲᓐᓂᕈᒪᔪᑦ ᐃᓚᖓᓂᑦ ᖃᐅᔨᓴᐃᓂᐅᑉ 2-3 ᐱᓇᓱᐊᕈᓯᕐᓄᑦ ᐊᑯᓐᓂᖏᓐᓂᑦ ᐃᓱᐊᓂᑦ ᓴᓪᓚᐹᑦ ᐊᒻᒪᓗ ᕿᑎᐊᓂᑦ ᐊᒍᓯᑐᕝᕙᒃ 2025-ᒥᑦ. ᐱᓕᕆᔩᑦ ᓯᑕᒪᐅᓇᔭᖅᑐᑦ ᖃᐅᔨᓴᐃᔩᑦ ᐊᒻᒪᓗ ᓂᕐᔪᑎᒥᑦ ᖃᐅᔨᓴᖅᑎᐅᓂᐊᖅᑐᒥᑦ, ᖃᒪᓂᑦᑐᐊᕐᒥᑦ ᖃᐅᑕᒫᑦ ᖁᓕᒨᓕᒃᑯᑦ ᖃᐅᔨᓴᐃᕝᕕᐅᓂᐊᖅᑐᓄᙱᐅᖃᑦᑕᕐᓗᑎᒃ. ᐊᑕᐅᓯᕐᒥᑦ ᐅᖅᓱᓂᑦ ᑐᖅᑯᖅᓯᔭᕆᐊᖃᕐᓂᐊᖅᑐᑦ 15 ᖃᑦᑕᐅᔭᕐᔪᐊᓂᑦ ᐱᓕᕆᐊᒧᑦ ᐊᑐᕐᓂᐊᖅᑐᓂᒃ ᖃᐅᔨᓴᐃᕝᕕᐅᔪᒥᑦ.ᓄᓇᒦᑎᓪᓗᒋ, ᐱᓕᕆᔩᑦ ᑲᑎᑦᑎᓂᐊᖅᑐᑦ ᐊᒡᒐᐅᑎᑎᑐᑦ ᐊᒃᑎᕆᔪᓂᒃ ᐅᔾᖅᑲᓂᒃ ᐆᒃᑐᕋᖅᑕᐅᓂᐊᖅᑐᓂᒃ, ᐊᒻᒪᓗ ᖃᑦᑕᕐᓂᑦ ᓯᕐᒦᑦ ᐊᓗᐊᓄᐊᖅᑐᓂᑦ (ᒪᕋᓚᒃ) ᐊᒡᒐᒧᑦ ᐱᔭᐅᓗᑎᒃ ᒥᑭᔪᓂᑦ ᐊᖕᒪᔪᓂᑦ, ᐊᒻᒪᓗ ᑎᑎᕋᐅᓯᓇᓗᒋᑦ ᖃᐅᔨᔭᐅᔪᑦ, ᐊᔾᔨᓕᐅᕆᓗᑎᒃ ᐊᒻᒪᓗ ᐆᒃᑐᕋᕐᓗᒍ ᓄᓇᐅᑉ ᐃᓚᒋᔭᖏᑦ ᓴᖅᑭᑎᑕᐅᓯᒪᔪᑦ ᓯᕐᒥᓄᑦ.ᑕᒪᕐᒥᓗᒃᑖᖅ ᓈᓴᐅᑏᑦ/ᑎᑎᖅᑲᐃᑦ ᓴᖅᑭᑎᑕᐅᓂᐊᖅᑐᑦ ᓄᓇᓕᓐᓂᕐᒧᑦ ᖃᓄᑕᐅᔭᒫᑦᑐᒃᑯᑦ ᓈᓴᐅᑎᓂᑦ/ᑎᑎᖅᑲᓂᒃ ᐊᒻᒪᓗ ᖃᓄᑕᐅᔭᒧᑦ ᐋᖅᑭᐅᒪᔪᓄᑦ NRCan-ᑯᑦ Open Geoscience Portal-ᖔᓂᑦ (ᐅᒃᑯᐃᖕᖓᔪᖅ ᓄᓇᒥᒃ ᖃᐅᔨᓇᓱᒃᑐᓕᕆᕝᕕᒃ). ᑕᒡᕙᐅᖃᑎᒋᑉᓗᒋᑦ ᑲᑎᒪᓚᐅᖅᑐᑦ ᖃᒪᓂᑦᑐᐊᕐᒥᑦ ᐊᕗᓐᓂᕕᒃ 2025-ᒥᑦ ᑐᓂᓂᐊᕐᓗᒋᑦ ᑐᒃᓯᕋᐅᑕᐅᔪᒥᒃ ᖃᐅᔨᓴᐃᓂᕐᒧᑦ, ᐊᒻᒪᓗ ᑭᖑᓪᓕᖅᐹᒃᑯᑦ ᖃᓄᐃᖓᓂᐅᔪᑦ ᑐᓂᔭᐅᓂᐊᖅᑐᑦ ᐃᓚᐅᖃᑕᐅᓯᒪᔪᓄᑦ ᓄᓇᓕᖕᓄᑦ ᐊᒻᒪᓗ ᐊᐅᓚᑦᑎᔨᓄᑦ ᑲᑐᔾᔨᖃᑎᒌᓄᑦ ᖃᓄᑕᐅᔭᒃᑯᑦ, ᐊᓕᓚᔪᒦᓪᓗᑎᒃ, ᐊᒻᒪᓗ ᑕᒡᕙᐅᖃᑎᒋᓗᒋᑦ ᐅᑉᓗᒥᒎᓕᖅᑐᖅᓯᒪᔪᑦ, ᑕᒪᒃᑖᕐᒧᑦ ᖃᐅᔨᓴᐃᓂᕐᒧᑦ ᖃᐅᔨᔭᐅᓂᐊᖅᑐᑦ ᖃᑉᓯᑲᓪᓚᖕᓄᑦ ᐅᑭᐅᓅᓇᔭᕋᓗᐊᖅᑎᓪᓗᒍ ᓴᓂ.

Inuinnaqtun: N/A

Personnel

Personnel on site: 6

Days on site: 15

Total Person days: 90

Operations Phase: from 2025-07-29 to 2025-08-12

Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Intended fuel cache location	Fuel and chemical storage	Crown	N/A	N/A	115 km SW of Baker Lake
Approximate intended fieldwork area	Scientific/International Polar Year Research	Crown	N/A	N/A	Baker Lake/Thelon Sanctuary Game
Approximate intended fieldwork area	Scientific/International Polar Year Research	Inuit Owned Surface Lands	N/A	N/A	Baker Lake/Thelon Sanctuary Game
Approximate intended data realease area	Scientific/International Polar Year Research	Inuit Owned Surface Lands	N/A	N/A	Baker Lake - Chesterfield Inlet - Rankin Inlet - Whale Cove - Arviat
Approximate intended data realease area	Scientific/International Polar Year Research	Crown	N/A	N/A	Baker Lake - Chesterfield Inlet - Rankin Inlet - Whale Cove - Arviat

Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Baker Lake	Angel Aksawnee	Hunters & Trappers Organization	2025-02-11
Baker Lake	Valerie Niego	Kivalliq Inuit Association, Baker Lake office	2025-02-11
Baker Lake	Sheldon Dorey	Hamlet of Baker Lake	2025-02-10
Baker Lake	Trevor Attungala	Hamlet of Baker Lake	2025-02-10

Authorizations

Indicate the areas in which the project is located:

Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Indigenous and Northern Affairs Canada	Permission to establish a fuel cache on Crown land	Active	2025-03-27	
Nunavut Research Institute	Research licence	Applied, Decision Pending		
Kivalliq Inuit Association	Land Use Licence No. KVX25N01	Applied, Decision Pending		

Project transportation types

Transportation Type	Proposed Use	Length of Use
Air	Astar 350B2 helicopter (fieldwork area)	
Land	Pick-up truck (in the community)	

Project accomodation types

Community

Material Use

Equipment to be used (including drills, pumps, aircraft, vehicles, etc)

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Helicopter	1	Exterior Height: 10 ft 4 in Wing Span: 35 ft 1 in Length: 35 ft 11 in	One Astar 350B2 helicopter will be used daily.
Shovels	3	1 m	Shovels will be used to dig holes and take soil samples daily.
Battery-powered portable rocksaw (DeWalt 60V MAX Brushless Cordless 9'' Cut-Off Saw)	1	12 in	The rocksaw will be used to collect bedrock or boulder samples daily.

Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Aviation fuel	fuel	15	205	3075	Liters	Fuel cache (15 drums) at intended location 63.856319 N and 98.156757 W. An electrical pump supplied by the helicopter contractor will be used for the transfer of Jet A aviation fuel.
Aviation fuel	fuel	15	205	3075	Liters	Stored at Baker Lake airport

Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
0		

Waste

Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Other	Other, Small waste, such as snack packaging	5 kg	Packed out and properly disposed of in Baker Lake	N/A

Environmental Impacts:

The proposed fieldwork will result in minimal environmental impact. Helicopter access to sites within the study area will be conducted at altitudes above 1,000 feet to avoid disturbing wildlife. Refueling will primarily occur at the Baker Lake airport, with an additional fuel cache of 12-15 drums located 100 km west of Baker Lake. These drums will be securely sealed and neatly arranged on dry mineral soil. A spill kit will be available at the refueling site, and all drums will be removed by helicopter and returned to Baker Lake for proper disposal at the end of the two-week fieldwork period. Fieldwork will involve the collection of small surface soil samples using a hand shovel and bedrock samples from outcrops or glacially transported boulders with a portable rock saw. Any excavated holes will be filled and covered with turf to minimize disturbance. No waste will be created from the proposed work. Any garbage would be small (i.e., waste from a lunch or snacks) and will be packed out of the site and returned to the base camp (Baker Lake) for proper disposal.

Additional Information

SECTION A1: Project Info

SECTION A2: Allweather Road

SECTION A3: Winter Road

SECTION B1: Project Info

SECTION B2: Exploration Activity

SECTION B3: Geosciences

SECTION B4: Drilling

SECTION B5: Stripping

SECTION B6: Underground Activity

SECTION B7: Waste Rock

SECTION B8: Stockpiles

SECTION B9: Mine Development

SECTION B10: Geology

SECTION B11: Mine

SECTION B12: Mill

SECTION C1: Pits

SECTION D1: Facility

SECTION D2: Facility Construction

SECTION D3: Facility Operation

SECTION D4: Vessel Use

SECTION E1: Offshore Survey

SECTION E2: Nearshore Survey

SECTION E3: Vessel Use

SECTION F1: Site Cleanup

SECTION G1: Well Authorization

SECTION G2: Onland Exploration

SECTION G3: Offshore Exploration

SECTION G4: Rig

SECTION H1: Vessel Use

SECTION H2: Disposal At Sea

SECTION I1: Municipal Development

Description of Existing Environment: Physical Environment

The proposed fieldwork area spans approximately 43,256 km², located between 96°–100°W and 63°–65°N, excluding the area delineated by the Thelon Wildlife Sanctuary. This region encompasses four physiographic divisions of the Kazan subregion within the Canadian Shield: the Kazan Upland in the south, the Thelon Plain in the northwest, and the Wager Plateau and Back Lowland in the northeast. The Kazan Upland dominates the area, covering 69% of the proposed field site. It features rugged, hilly terrain with elevations ranging from ~2 to ~350 m and is underlain by continuous permafrost with medium to low ground ice content. The Thelon Plain occupies 24% of the area and consists of relatively flat terrain between ~70 and 300 m in elevation. It is also characterized by continuous permafrost, though with lower ground ice content. The Wager Plateau covers 6% of the study area and ranges from ~85 to 200 m in elevation, while the Back Lowland, making up just 1% of the area, ranges from ~2 to 230 m. Both also lie within zones of continuous permafrost with low ground ice. The Thelon River system in the northwest and the Kazan River system in the southeast are the main hydrological features of the region, and small water bodies and wetlands are numerous. Notable lakes include: In the south: Tulemalu, Nutarawit, and Forde Lakes In the central region: Wharton, Marjorie, Tebesjuak, Mallery, Princess Mary, and Pitz Lakes In the north: Aberdeen, Qamanaarjuk, and Shultz Lakes. The region's physiography is partly shaped by its bedrock geology, which includes the sedimentary and volcano-sedimentary rocks of the Dubawnt Supergroup, the Hudson and Nueltin igneous suites, and the crystalline rocks of the Hearne and Rae cratons. These bedrock units have been differentially eroded by glaciers over successive glaciation cycles, resulting in a varied and complex surface geology. Glacial activity has produced a mosaic of exposed bedrock and a complex assemblage of surficial deposits, including till, glaciofluvial, and glaciolacustrine sediments. The landscape is further characterized by a variety of glacial landforms, such as streamlined features, occasional esker ridges, different types of moraines, and raised glaciolacustrine and marine shorelines.

Description of Existing Environment: Biological Environment

The proposed fieldwork area is predominantly characterized by low Arctic shrub tundra or sub-polar/polar shrubland-lichen-moss vegetation. Only the northern portion of the area features mid-Arctic dwarf shrub or sub-polar/polar grassland-lichen-moss tundra (Baldwin et al., 2019; Land Cover of Canada, 2020). This region overlaps with the migration routes and calving grounds of several Barren-ground Caribou herds, including the Ahiak, Lorillard, Qamanirjuaq, and Wager Bay herds (Environment and Climate Change Canada, 2021). It also lies within the range of other wide-ranging wildlife species such as muskoxen, wolves, wolverines, Arctic hares, Arctic foxes, grizzly bears, and various migratory and non-migratory bird species. Additionally, the area overlaps with the known range of several terrestrial species at risk in Nunavut listed under Schedule 1 of the federal Species at Risk Act (SARA), including Barren-ground Caribou (Napaaqtuqangituqmiut Tutungit), Grizzly Bear (Akłait), and Wolverine (Qavvik; see Fig. 10). The proposed fieldwork area also intersects with the ranges of several bird species listed as at risk: the Peregrine Falcon (Kiggaviarjuk or Kigavik), the Red-necked Phalarope (Aupaluktuq Saurraq or Aupaqtuq Saarvaq), and the Short-eared Owl (Siutikituq Ukpik) (Environment and Climate Change Canada, 2021). Environment and

Climate Change Canada (2021). Species at risk in Nunavut 2021. EC21221, Environment and Climate Change Canada, 1-93. https://www.canada.ca/en/environment-climate-change/services/species-risk-education-centre/species-risk-nunavut-2021.html#toc0Natural Resources Canada (2020). 2020 Land Cover of Canada. Natural Resources Canada, Federal Geospatial Platform. https://osdp-psdo.canada.ca/dp/en/search/metadata/NRCAN-FGP-1-ee1580ab-a23d-4f86-a09b-79763677eb47Baldwin, K.; Allen, L.; Basquill, S.; Chapman, K.; Downing, D.; Flynn, N.; MacKenzie, W.; Major, M.; Meades, W.; Meidinger, D.; Morneau, C.; Saucier, J-P.; Thorpe, J.; Uhlig, P. 2019. Vegetation Zones of Canada: a Biogeoclimatic Perspective. [Map] Scale 1:5,000,000. Natural Resources Canada, Canadian Forest Service. Great Lake Forestry Center, Sault Ste. Marie, ON, Canada.

Description of Existing Environment: Socio-economic Environment

The proposed fieldwork area is primarily located on Nunavut Crown lands under the jurisdiction of Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC). One fuel cache, consisting of 15 drums, is planned on Crown land, and permission has been granted by CIRNAC. Portions of the proposed fieldwork area also include Inuit Owned Lands belonging to the community of Baker Lake. We are currently in communication with the Kivalliq Inuit Association to obtain access to these lands. A Site Data Request Form has been submitted to the Territorial Archaeologist to obtain the locations of any known archaeological sites within the proposed area and we are currently awaiting a response.

Miscellaneous Project Information

Briefing on the safety of the planned workplaces before and during the fieldwork: All crew members are required to review and sign a field checklist and will be reminded of their obligation to adhere to the health and safety procedures outlined by the Lands and Minerals Sector of Natural Resources Canada upon arrival at the base camp in Baker Lake. Prior to fieldwork, the field party leader will review field operations and safety procedures with all crew members. Emergency Response Plan: The field party leader must complete pre-emergency planning activities prior to the commencement of any field operations to ensure effective coordination of on-site emergency response plans with employees, local emergency services, and Natural Resources Canada (NRCan). During fieldwork, one crew member will remain at the base camp in Baker Lake at all times to maintain communication with the field crew and helicopter via InReach Explorer+ devices and satellite phones. In the event of an emergency, the crew member stationed at base camp will initiate the search and rescue or medical evacuation protocol in coordination with NRCan and other relevant authorities, such as the local RCMP. The field crew is instructed to activate the SOS function on the InReach Explorer+ device in all emergency situations. At all sites accessed by helicopter, all crew members, including the wildlife monitor, will be equipped with two-way radios and will remain within visual contact of one another. If the helicopter departs the site for refueling, the team will remain together at the drop-off site with communication devices and an emergency drop-pack. Search and rescue protocols: If the field crew has not returned within 2 hours of the scheduled return time and has not communicated with the crew member at base camp to report a schedule change, emergency procedures will be activated. The crew member at base camp, in coordination with NRCan authorities, will work with the local RCMP and the National Search and Rescue teams if necessary. The field team is instructed to remain at the site and await rescue.Medical evacuation procedures: In the event of a medical evacuation, the team is instructed to immediately communicate with the crew member at base camp, who will initiate the emergency procedures. The injured individual(s) will be transported to the Baker Lake Health Centre by helicopter, if available, or by the next available aircraft. If further medical care is required, they will be transferred to Winnipeg by plane at the earliest opportunity. Once the injured person(s) have been stabilized, NRCan authorities will be promptly notified of the situation.

Identification of Impacts and Proposed Mitigation Measures

During consultations with the community of Baker Lake, culturally sensitive areas within the proposed study area were identified and mapped. These areas will be strictly avoided during fieldwork. Should any new culturally significant sites be inadvertently encountered, all work in the vicinity will cease immediately. The site will be documented with notes and photographs, and reported to the relevant authorities for proper cataloging. To minimize wildlife disturbance, helicopter flights will be conducted at altitudes of 1,000 feet or higher, with most study sites being located at least 25 km from the community. If wildlife is observed at a site of interest, no landing will be attempted, and the helicopter will proceed to the next planned location. Sites where landings cannot be completed could be revisited at a later date, once wildlife has vacated the area and in accordance with advice from the wildlife monitor. On the ground, the crew will travel on foot

within the vicinity of the aircraft, minimizing disturbance to vegetation. Disturbance will be limited to the immediate area surrounding the sampling hole, typically within a one-meter radius. Fieldwork will be avoided in fragile environments, such as wetlands. Additionally, the crew will document and report wildlife observations. All small waste, such as snack packaging, will be packed out and properly disposed of in Baker Lake. A fuel cache consisting of 12-15 drums will be set up approximately 115 km southwest of Baker Lake to minimize unnecessary flights between the community and the sites of interest. The closed-head steel drums at the fuel cache will be securely sealed and placed on dry mineral soil to reduce environmental impact following CIRNAC guidelines. A spill kit will be available at the refueling site, and all drums will be removed by helicopter and returned to Baker Lake for proper disposal at the end of the two-week fieldwork period. The impacts on the physical environment are likely to be localized, of low-magnitude, reversible and restricted to the short period of the proposed project activity. Soil and bedrock samples will be collected using non-invasive methods, including hand tools and a battery-powered portable rock saw. Any excavated holes (typically 0.4 m in diameter and 0.5 m deep) will be backfilled and restored with turf to minimize environmental disturbance.

Cumulative Effects

The cumulative effect on the environment are likely to be localized, of low-magnitude, reversible and restricted to the short period of the proposed project activity. However, our work will provide baseline environmental data on surface and bedrock geology, as well as sediment and soil quality, which will be valuable for informed decision-making. Additionally, our efforts will document unique glacial landscapes that could be considered for the preservation of sites of scientific and environmental significance.

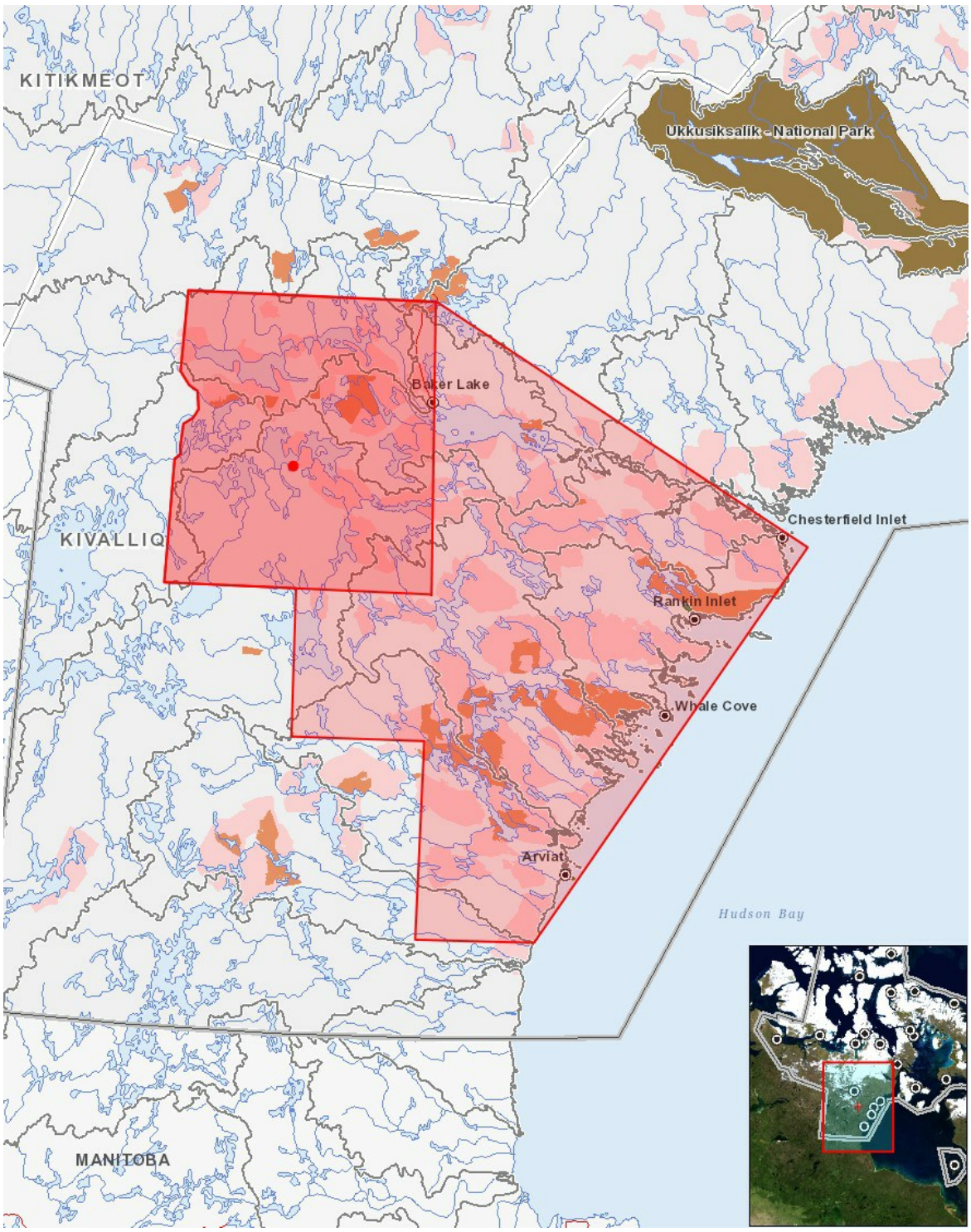
Impacts

Identification of Environmental Impacts

	PHYSICAL	Designated environmental areas	Ground stability	Permafrost	Hydrology / Limnology	Water quality	Climate conditions	Eskers and other unique or fragile landscapes	Surface and bedrock geology	Sediment and soil quality	Tidal processes and bathymetry	Air quality	Noise levels	BIOLOGICAL	Vegetation	Wildlife, including habitat and migration patterns	Birds, including habitat and migration patterns	Aquatic species, incl. habitat and migration/spawning	Wildlife protected areas	SOCIO-ECONOMIC	Archaeological and cultural historic sites	Employment	Community wellness	Community infrastructure	Human health
Construction																									
-		-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-
Operation																									
Fuel and chemical storage		-	-	-	-	-	-	-	-	-	M	-	-	-		-	-	-	-	-		-	-	-	-
Scientific/International Polar Year Research		-	-	-	-	-	-	P	P	P	-	-	-		-	-	-	-	-		-	P	-	-	-
Decommissioning																									
-		-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-

(P = Positive, N = Negative and non-mitigatable, M = Negative and mitigatable, U = Unknown)

Project Location



List of Project Geometries

1	polygon	Approximate intended fieldwork area
2	polygon	Approximate intended data realease area
3	point	Intended fuel cache location