



## **NIRB Application for Screening #126246**

### **Assessing changing cryohydrogeologic conditions with locally-relevant landscape indicators in Nunavut, Canada**

**Application Type:** New

**Project Type:** Scientific Research

**Application Date:** Tuesday, October 28, 2025

**Period of operation:** from 2025-10-25 to 2027-12-27

**Project Proponent:** Michelle Blade  
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## Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Arviat - Itiguarjuit (rolling hills) overflow area	Sampling sites	Municipal	N/A	N/A	Approximately 20 km NNW of Arviat
Arviat - Amaruqtalik (wolf esker) overflow area	Sampling sites	Municipal	N/A	N/A	10km SSW of Arviat
Rankin Inlet - overflow area #1	Sampling sites	Inuit Owned Sub-Surface Lands	N/A	N/A	Approximately 20km NNW of Rankin Inlet
Rankin Inlet - overflow area #2	Sampling sites	Municipal	N/A	N/A	Approximately 11 km WNW from Rankin Inlet
Coral Harbour - Mamittuittuq overflow area	Sampling sites	Inuit Owned Surface Lands	N/A	N/A	125km WSW of Coral Harbour Within 2km (but outside) the Ikkattuaq Migratory Bird Sanctuary boundary
Iqaluit - overflow area #1	Sampling sites	Crown	N/A	N/A	Approximately 15km SE of Iqaluit
Whale Cove - overflow area	Sampling sites	Crown	N/A	N/A	Approximately 30km NW of Whale Cove

## Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Rankin Inlet	Kono Tattuinee (President)	Kivalliq Inuit Association (KIA) head office	2024-11-19
Rankin Inlet	Tommy Bruce (Manager, Industrial Relations and Technology (Business and Economic Development))	Kivalliq Inuit Association (KIA) head office	2024-11-19
Rankin Inlet	Maria Serra (G.I.S. Coordinator)	Kivalliq Inuit Association (KIA) head office	2024-11-19
Arviat	Shirley Tagalik (Board of Directors Chair)	Aqqiumavvik Society	2024-11-20
Arviat	Kukik Baker (Executive Director)	Aqqiumavvik Society	2024-11-20
Arviat	Darryl Baker (Inuit Educator)	Aqqiumavvik Society	2024-11-21
Arviat	Alex Ishalook (Chair) + 4 Board Members	Arviat Hunters and Trappers Organization	2024-11-21
Arviat	Jimmy Muckpah (SmartICE Operations)	Aqqiumavvik Society	2024-11-20

	and Knowledge Coordinator, Aqqiumavvik Society – Arviat)		
Arviat	Lucas Owljoot (SmartICE Knowledge Coordinator, Aqqiumavvik Society – Arviat)	Aqqiumavvik Society	2024-11-20
Arviat	Dr. Katherine Wilson (Director of Knowledge Co-Production)	SmartICE	2024-11-18
Arviat	John Main (Member of Cabinet, Arviat North-Whale Cove Constituency)	Member of the Legislative Assembly	2024-11-22
Rankin Inlet	Atuat Shouldice	Crown-Indigenous Relations and Northern Affairs Canada	2025-06-04
Rankin Inlet	Kyle Amsel	Crown-Indigenous Relations and Northern Affairs Canada	2025-06-04
Iqaluit	Christine Wilson	Environment and Climate Change Canada	2025-09-27
Whale Cove	Oliver Shipton (Mayor of Whale Cove, Wildlife Officer)	Hamlet of Whale Cove	2025-10-15
Coral Harbour	Tooma Nakushuk	Hamlet of Coral Harbour	2025-10-24

# Authorizations

Indicate the areas in which the project is located:

Kivalliq  
South Baffin

## Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Nunavut Planning Commission	Conformity Determination	Applied, Decision Pending		
Nunavut Water Board	Application for Approval Without a Licence No: 8WLC-ACC----	Applied, Decision Pending		
Nunavut Research Institute	Physical/Natural Sciences Research Permit	Applied, Decision Pending		

## Project transportation types

Transportation Type	Proposed Use	Length of Use
Air	Commercial (Calm Air, Canadian North) flights between communities	
Land	Snowmobile, ATV, or Truck	

## Project accommodation types

Community

# Material Use

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

Equipment Type	Quantity	Size - Dimensions	Proposed Use
snowmobile + qamutiik	2	3x8ft	Up to two snowmobiles with qamutiik (wooden sleds) to transport researchers and field gear
ATV	2	5x5ft	Up to two all-terrain vehicles will be utilized to transport researcher personnel and field gear to and from field data collection areas.
Trail cameras	14	6x4inches	Trail cameras installed one metre above ground level on wooden stakes to take daily photos of overflow water and icing formation
sensors - solinst levelogger	14	8.5x1inch	Solinst leveloggers to install in nearby lake(s) and overflow water areas to record daily water temperature, electrical conductivity, and water level
sensors - ibutton	14	1inch	ibutton sensors to install in nearby lake(s) and overflow water areas to record daily water temperature
truck	1	7x19ft	Up to one truck will be utilized to transport researcher personnel and field gear to and from field data collection areas.

## Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Information is not available						

## Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
0	A total of 12 unnamed lakes and 10 overflow areas near Arviat, Whale Cove, Rankin Inlet, Coral Harbour, Iqaluit (see map)	Submerge water sampling containers in water source

# Waste

## Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Sampling sites	Combustible wastes	10kg	All water sampling equipment (gloves, bottles, etc) will be removed from site and disposed of in southern Canada.	Wooden stakes for trail cameras will be donated to the community for firewood.

### Environmental Impacts:

This research project was co-designed with Nunavut residents and organizations in order to align the research topic, question, and methods with community research priorities and safe winter overland travel community data information needs. Environmental impacts are negligible. Research personnel will stay in community accommodations and do day trips to the field data collection locations in the Fall and Spring traveling by snowmobile, ATV, or truck along regularly utilized community overland routes. No fuel drums/containers nor supply caches will be established on the land at anytime. No waste will be deposited. All trail cameras, wooden stakes, and sensors will be removed at the end of the research project. Research project methods (timelapse cameras, sensors, and water sampling) were selected to avoid any potential impacts to water quality and quantity (i.e. no drilling). Research equipment (sensors and timelapse cameras) were selected based on their small size to minimize and avoid disruptions. Overland travel to and from the field locations will take place when local community members deem the conditions are safe and at times that will not disrupt local community member and wildlife activities (i.e. in compliance with caribou and/or other wildlife protection measures).

# **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**

Overland transportation to/from the sampling sites takes place by truck on municipal roads, or by snowmobile or ATV on regularly utilized local community overland trails (often sandy or gravelly). Topography is flat. Sampling sites have a sand, gravel, or boulder surficial geology. Arviat sampling sites are near sandy hills (i.e. esker or raised marine beach). Water flows through this surficial geology and then onto the land surface to create the overflow areas and subsequent icings in the winter. Water is clear and colourless, and of good quality. Bedrock is near surface and underlies the surficial geology. Permafrost is continuous. Ice lenses, or other permafrost features, are not apparent. Soil profile is less than 1cm thick or non-existent. Air quality is good. No noise at the sampling sites unless a community member is passing by on a snowmobile or ATV. Ground is slowly rising above sea level at a rate of 9 millimetres per year due to isostatic rebound.

### **Description of Existing Environment: Biological Environment**

Some algae growth has been reported by local community members as a result of the overflow water. Tundra vegetation growth is minimal (sporadic) with surficial geology often exposed at surface. Lakes are small in size. Some lakes of sufficient depth to not freeze to the bottom during winter contain fish. Geese land on the lakes during the summer. Sampling sites do not take place within wildlife protected areas, but are within the typical habitat of caribou, polar bear, grizzly bear, wolverine, Harris's Sparrow – Qupanuarjuk or Qupanuaqand, Peregrine Falcon – Kiggaviarjuk or Kigavik, Red-necked Phalarope – Aupaluktuq Saurraq or Aupaqtuq Saarvaq, Red-necked Phalarope – Aupaluktuq Saurraq or Aupaqtuq Saarvaq, Short-eared Owl – Siutikituq Ukpik, other wildlife. No research takes place in the marine environment. Researchers will comply with all caribou, polar bear, grizzly bear, wolverine and/or other wildlife protection measures when traveling to/from sampling sites, and while at sampling sites.

### **Description of Existing Environment: Socio-economic Environment**

Research personnel stay in each communities' established accommodations, utilizing existing community infrastructure for personal needs and providing economic benefit to each community. Local community members, and their trucks, ATVs and snowmobiles, are hired in each community to accompany researchers onto the land thereby providing further local community socio-economic benefit. Community members regularly use the established overland trails to get to their cabins or hunting areas by snowmobile and ATV. Arviat, Rankin Inlet, and Iqaluit sampling sites sometimes used by community members to refill water bottles.

### **Miscellaneous Project Information**

This research project was co-designed with the Aqqiumavvik Society and Hunters and Trappers

Organization in Arviat, Nunavut through three in-person visits to the communities of Arviat and Rankin Inlet in November 2024, May 2025, and October 2025. In-person visits entailed being on the agenda of the Arviat Hunters and Trappers Organization Board meetings to engage them on the intention of the research, and decide on the research topic, methods, and sampling sites. Meetings and informal conversations were had with the Aqqiumavvik Society, the Mayor of Arviat, the Kivalliq Inuit Association Head Office, Arviat Wildlife Office, and private citizens to provide input on the research project design and further align this project's activities to benefit local decision makers information needs and compliment/enhance existing research projects and activities taking place in the community. The aforementioned organizations, based on their knowledge, also provided information on additional communities with known overflow area in Nunavut (and local community residents) for me to contact. The local Hamlet Office and Hunters and Trappers organization in each participating community were engaged with to confirm the existence of their known overflow areas and receive their support for those locations to be included in this research project.

### **Identification of Impacts and Proposed Mitigation Measures**

Overland transportation takes place on existing local community overland trails to thereby not cause any new ground disturbances nor erosion. Water samples are collected from the lake shore or standing on the land next to the overflow area water (i.e. no boats nor boots entering of water bodies) to avoid possible altering of water quality. Sampling methods and equipment were selected for their small size to not disturb the environment. Hunters and Trappers Organizations and Hamlet Offices in each community are contacted to go over project methods and equipment, and incorporate any mitigation measures specific to that community (i.e. days it is best to access the sampling sites). Researchers will comply with all caribou, polar bear, grizzly bear, wolverine and/or other wildlife protection measures when traveling to/from sampling sites, and while at sampling sites. No fuel drums/containers nor supply caches will be established on the land at anytime. No waste will be deposited.

### **Cumulative Effects**

Cumulative effects of water sampling, small sensors use, timelapse cameras use, accessing the sampling sites twice per year on the communities' regularly utilized trails, and staying in community accommodations are NEGLIGIBLE. All trail cameras, wooden stakes, and sensors will be removed from the sampling sites at the end of the research project.

# Impacts

## Identification of Environmental Impacts

	PHYSICAL										BIOLOGICAL					SOCIO-ECONOMIC						
	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	Vegetation	Wildlife, including habitat and migration patterns	Birds, including habitat and migration patterns	Aquatic species, incl. habitat and migration/spawning	Wildlife protected areas	Archaeological and cultural historic sites	Employment	Community wellness	Community infrastructure	Human health
<b>Construction</b>																						
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<b>Operation</b>																						
Sampling sites	P	P	P	-	P	P	P	P	P	P	P	P	P	P	P	P		P	P	P	P	P
<b>Decommissioning</b>																						
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

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

## Project Location



## List of Project Geometries

- |   |         |  |
|---|---------|--|
| 1 | polygon | Arviat - Itiguarjuit (rolling hills) overflow area |
| 2 | polygon | Arviat - Amaruqtaalik (wolf esker) overflow area   |
| 3 | polygon | Rankin Inlet - overflow area #1                    |
| 4 | polygon | Rankin Inlet - overflow area #2                    |
| 5 | polygon | Coral Harbour - Mamittuittuq overflow area         |
| 6 | polygon | Iqaluit - overflow area #1                         |
| 7 | polygon | Whale Cove - overflow area                         |