



NIRB Application for Screening #125805

Western Hudson Regional Bedrock Mapping

Application Type: New

Project Type: Scientific Research

Application Date: 4/26/2023 3:43:49 PM

Period of operation: from 0001-01-01 to 0001-01-01

Proposed Authorization: from 0001-01-01 to 0001-01-01

Project Proponent: Martin McCurdy
Natural Resources Canada
601 Booth Street
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Canada
Phone Number:: 1-613-859-5835, Fax Number::

DETAILS

Non-technical project proposal description

English: This activity proposes to study the evolution of different geological zones between Baker Lake and Whale Cove. Learning how these rocks formed and moved can change our understanding of how the early Earth formed and affect interpretations of the potential presence of minerals and metals such as gold. Dr. Sally Pehrsson and her team would combine the re-examination of previously collected rock samples with analysis of new samples and GPS data gathered on the land. The proposed 2023 fieldwork would be conducted by a group of 6 researchers and a wildlife monitor over two weeks this summer. The team would collect fist-sized samples of rocks along Chesterfield Inlet. Results from this work could provide geological information within the proposed Hydro-fibre Link Corridor and propose models for gold and critical mineral movement in the area.

French: Cette activité propose d'étudier l'évolution de différentes zones géologiques entre le lac Baker et Whale Cove. Apprendre comment ces roches se sont formées et déplacées peut changer notre compréhension de la façon dont la Terre primitive s'est formée et affecter les interprétations de la présence potentielle de minéraux et de métaux tels que l'or. La Dre Sally Pehrsson et son équipe combineront le réexamen d'échantillons de roche prélevés antérieurement avec l'analyse de nouveaux échantillons et de données GPS recueillies sur le terrain. Le travail de terrain proposé pour 2023 serait mené par un groupe de 6 chercheurs et un moniteur de la faune pendant deux semaines cet été. L'équipe recueillerait des échantillons de roches de la taille d'un poing le long de Chesterfield Inlet. Les résultats de ces travaux pourraient fournir des renseignements géologiques dans le corridor de liaison hydro-fibre proposé et proposer des modèles pour le transport de l'or et des minéraux critiques dans la région.

[illegible]

Personnel

Personnel on site: 6

Days on site: 10

Total Person days: 60

Operations Phase: from 2023-08-01 to 2023-08-10

Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Areas covered by proposed field work and legacy sample research in 2023	Scientific/International Polar Year Research	Inuit Owned Surface Lands	Bedrock geology of the study area was compiled from mapping in 1996, 1998 & 1999. An aeromagnetic survey (2014) imaged new regional structures in a poorly exposed area. Between 2008 and 2020 targeted studies informed regional metallogenic and stratigraphic models; geophysical surveys provided crustal scale models. The Hudson Bay Lithospheric Experiment (2007) provided deep crust and lithosphere models. A recent Ph.D. thesis identified high-pressure rocks above the Greyhound gold trend.	A crew member who discovers an archaeological artifact/fossil will be instructed not touch or remove it from the location where it was found. Should any archaeological remains be encountered, activity in the area of the find will cease immediately and contact will be made to the Territorial Archaeologist (867) 934-2040 as soon as possible. A Wildlife Monitor from Baker Lake or Chesterfield Inlet will be present.	The Hamlets of Chesterfield Inlet and Baker Lake are located proximal to the survey area. Iqalugaarjuup Nunanga Territorial Park falls within the boundaries of the survey area; however, no sampling will take place within the boundaries of the park. The Hamlet of Rankin Inlet is located approximately 90 km south of the survey area.

Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Cambridge Bay	Mr. Jorgan Aitaok	Nunavut Tunngavik Incorporated	2023-02-10
Rankin Inlet	Mr. Luis Manzo	Kivalliq Inuit Association	2023-02-10
Rankin Inlet	Mr. Andre Aokaut	Kangiqliniq Hunters & Trappers Organization	2023-02-10
Rankin Inlet	Mayor Harry Towtongie	Hamlet of Rankin Inlet	2023-02-10
Arviat	Ms. Nicole Issakiark	Arviat Hunters and Trappers Organization	2023-02-10
Arviat	Mr. Joe Savikataaq	Hamlet of Arviat	2023-02-10
Arviat	Mr. Steve England	Hamlet of Arviat	2023-02-10
Chesterfield Inlet	Mr. Tony Amauyak	Hamlet of Chesterfield Inlet	2023-02-10

Chesterfield Inlet	Mr. John Ivey	Hamlet of Chesterfield Inlet	2023-02-10
Chesterfield Inlet	Mr. Harry Aggark	Aqigiq Hunters and Trappers Organization	2023-02-10
Chesterfield Inlet	Ms. Janice Aggark	Aqigiq Hunters and Trappers Organization	2023-03-01
Baker Lake	Mr. Richard Awksawnee	Hamlet of Baker Lake	2023-02-10
Baker Lake	Mr. Sheldon Dory	Hamlet of Baker Lake	2023-02-10
Baker Lake	Mr. Brian Pudnak	Baker Lake Hunters and Trappers Organization	2023-02-10

Authorizations

Indicate the areas in which the project is located:

Kivalliq

Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Nunavut Research Institute	Scientific Research Licence Application	Applied, Decision Pending		
Kivalliq Inuit Association	Application to Access Inuit-Owned Land and Water Use	Not Yet Applied		

Project transportation types

Transportation Type	Proposed Use	Length of Use
Air	Helicopter (Bell 260B L4)	

Project accomodation types

Community

Material Use

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

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Bell 206L LongRanger	1	39 ft 8 in	Ten days proposed to ferry research scientist and assistants from Rankin Inlet (5 days) and Baker Lake (5 days) airport to exposed bedrock localities, and return to community each evening.

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	1	4543	4543	Liters	Jet-A aviation gas for the helicopter will be purchased from fuelling stations at Baker Lake Airport and Rankin Inlet Airport.

Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
300	Hotel tap	Rankin Inlet and Baker Lake hotels

Waste

Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Scientific/International Polar Year Research	Greywater	3000 litres	Municipal water treatment	None
Scientific/International Polar Year Research	Sewage (human waste)	30 kg	Municipal water treatment	None

Environmental Impacts:

The predicted environmental impacts (physical, biological, socioeconomic) are expected to be minimal. Iqalugaarjuup Nanange Territorial Park is within the survey area, but sampling will take place outside the park boundaries. Noise from the helicopter will be mitigated by avoiding residences and flying 1,000 ft above the land as much as possible, as well as avoiding critical wildlife and bird habitats. Consultation with local sources of knowledge and the wildlife monitor will be an ongoing and daily process throughout the survey in order to avoid critical habitats, including migrating and birthing caribou. Fuel for the helicopter will be purchased from fueling stations at Rankin Inlet Airport and Baker Lake Airport. No fuel caches on the land are planned.

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 area of the research activity is approximately 14,000 km², between 63.5°N and 64.5°N and 90°W and 97°W. This area falls within the Maguse River Uplands ecoregion covering the uplands south of Chesterfield Inlet and extending as far south as Churchill and includes much of the northwest coast of Hudson Bay. The Maguse River upland ecoregion is classified as having a low arctic ecoclimate. Coastal climate is moderated by the open waters of Hudson Bay during the late summer and early fall prior to freeze-up when damp foggy weather is common. The mean annual precipitation ranges 250-400 mm with more than 400 mm occurring south of Arviat. Temperature and precipitation increase to the south of the ecoregion. The region is associated with areas of continuous permafrost with medium ice content and with Turbic Cryosolic soils. Unfrozen Organic (Mesisol) and Regosolic soils also occur in this ecoregion. Crystalline Archean massive rocks form broad, sloping uplands and lowlands. Hummocky bedrock outcrops covered with discontinuous acidic, sandy, granitic tills are dominant. Prominent fluvioglacial ridges (eskers) also occur. Wetlands make up 25-50% of the land area and are characteristically lowland low- and high-centred polygon fens.

Description of Existing Environment: Biological Environment

It is characterized by a cover of shrub tundra vegetation. Dwarf birch, willow, and alder occur on warm, dry sites; poorly drained sites are dominated by willow, sphagnum moss, and sedge. Wildlife includes barren-ground caribou, arctic fox, weasel, arctic ground squirrel, and lemming. Bird species include willow ptarmigan, snowy owl, and rough-legged hawk. Waterfowl, particularly sea ducks, snow geese, swans, Canada geese and shorebirds are common in the coastal areas. White (beluga) whale and seals inhabit coastal waters. The Barren Ground population of caribou is considered a Species at Risk.

Description of Existing Environment: Socio-economic Environment

The Hamlets of Baker Lake and Chesterfield Inlet are situated within the boundaries of the proposed survey area. The Hamlet of Rankin Inlet is located approximately 90 km south of the survey area. The helicopter used for collecting lake sediment and water samples will be based in Rankin Inlet for five working days and Baker Lake for five working days. Sample collection will be carried out by a crew of five consisting of a pilot, GSC employee, university professor, Ph.D. student and wildlife monitor. Food and lodging for the university researchers, helicopter pilot and Geological Survey of Canada (GSC) employee will be purchased from one or both communities of Baker Lake and Rankin Inlet.

Miscellaneous Project Information

Emergency Response Plan Spills Contingency Plan Wildlife Monitoring and Management Plan

Identification of Impacts and Proposed Mitigation Measures

Local knowledge will be employed to avoid archaeological and culturally significant sites throughout the survey.

Palaeontological components of surface and bedrock geology will not be impacted by operations as the helicopter will only be landing on water, airports and one or two fuel cache locations. Effects on subsistence harvesting, tourism, trapping and guiding operations will be minimized by consulting with local authorities in advance of the commencement of survey operations. Daily flight plans will be adjusted as needed. As the survey operations are entirely airborne, local and regional traffic patterns will not be affected. Ongoing consultation with the communities before and during survey operations is designed to avoid negative effects on Human Health, including physical, social, psychological, and spiritual effects.

Cumulative Effects

Impacts on the physical and biological environments will be localized, of low-magnitude, reversible and fall within the approximately ten-day period of the proposed geological field work; the cumulative impacts on the physical and biological environments will therefore be minimal. Based on helicopter fuel consumption of 113.6 litres per hour for the approximately 40 hours that the helicopter will fly to collect bedrock samples and make observations, greenhouse gas emissions will be about 10.7 metric tons, equivalent to 2.4 to 3.3 gasoline-powered vehicles driven for one year (Natural Resources Canada Greenhouse Gas Equivalencies Calculator; United States Environmental Protection Agency Greenhouse Gas Equivalencies Calculator).

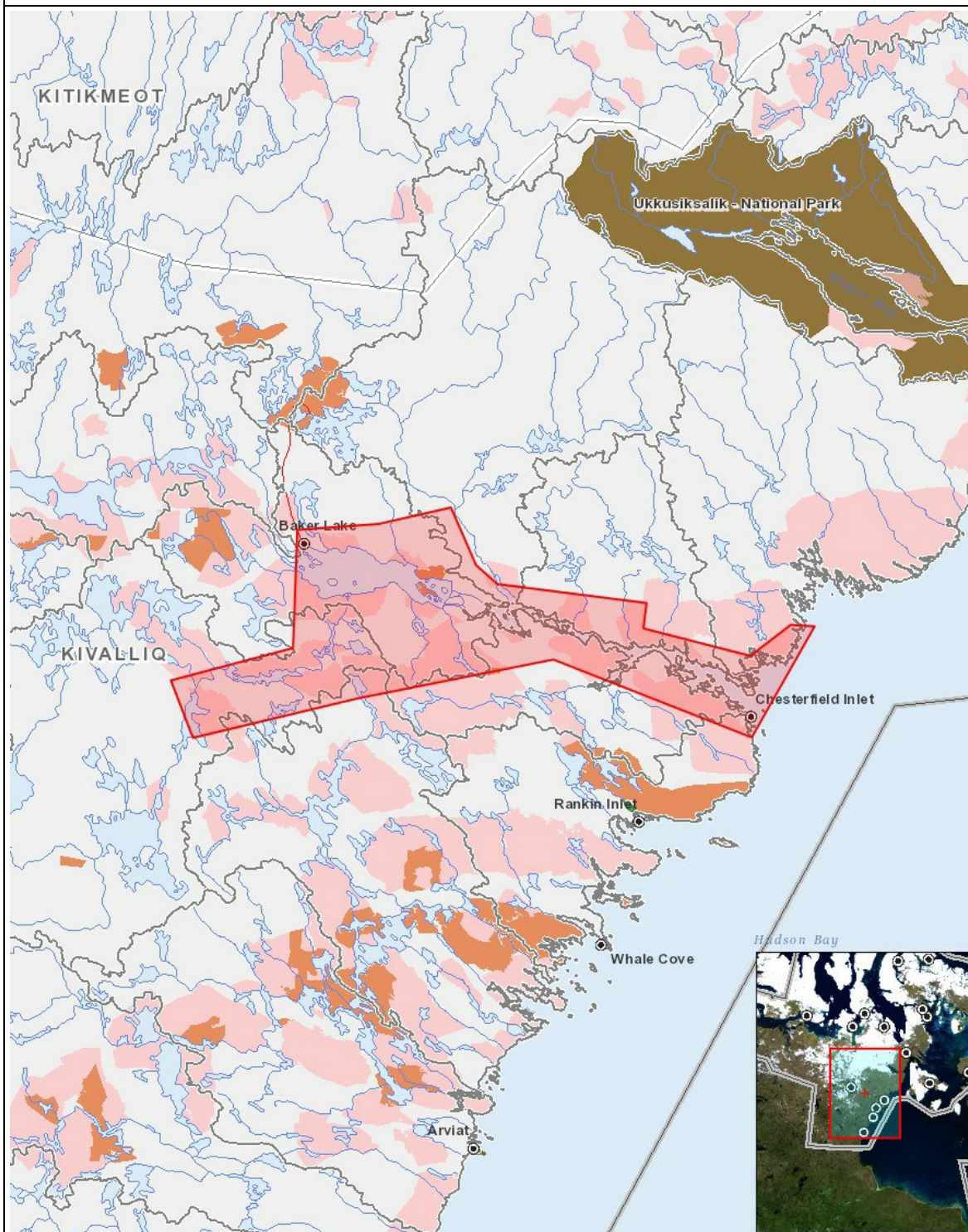
Impacts

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																											
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Operation																											
Scientific/International Polar Year Research		M	-	-	-	-	-	-	-	-	-	-	-	-	M		-	M	M	-	M		-	P	-	P	-
Decommissioning																											
-		-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-

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

Project Location



List of Project Geometries

- | | | |
|---|---------|---|
| 1 | polygon | Areas covered by proposed field work and legacy sample research in 2023 |
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