



NIRB Uuktuutinga Ihivriughikhamut #125803

Lake sediment geochemistry survey

Uuktuutinga Qanurittuq: New

Havaap Qanurittunia: Scientific Research

Uuktuutinga Ublua: 4/20/2023 2:00:45 PM

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

Piumayaat Angirutinga: from 0001-01-01 to 0001-01-01

Havauhikhaq Ikayuqtinga: Stephen Day
Geological Survey of Canada (NRCan)
601 Booth St
Ottawa Ontario K1A 0E8
Canada
Hivayautit Nampanga:: 343-549-6255, Kayumiktukkut Nampanga::

QANURITTUT

Tukihiannaqtunik havaariyauyumayumik uqauhiuyun

Qablunaatitut: This activity proposes to conduct a regional lake sediment and water survey in the Kivalliq region. This type of survey can improve regional understanding of naturally occurring metals to help assess mineral potential and establish the baselines of naturally occurring metals and minerals in lakes. Contractors supervised by GSC researchers would use a helicopter based in Rankin Inlet to visit lakes within the study area. A team of 3 people would collect mud from the bottom of lakes and surface water samples for analysis. Originally proposed to take place over two summers beginning in 2022, the activity was postponed and is now being proposed to take place entirely in July and August, 2023.

Uiviiititut: Cette activité propose de mener un relevé régional des sédiments et de l’eau lacustres dans la région de Kivalliq. Ce type de relevé peut améliorer la compréhension régionale des métaux naturels afin d’aider à évaluer le potentiel minéral et à établir les données de référence des métaux et minéraux naturels dans les lacs. Les entrepreneurs supervisés par les chercheurs de la CGC utiliseraient un hélicoptère basé à Rankin Inlet pour visiter les lacs dans la zone d’étude. Une équipe de 3 personnes recueillerait de la boue au fond des lacs et des échantillons d’eau de surface pour analyse. Initialement prévue pour se dérouler sur deux étés à partir de 2022, l’activité a été reportée et est maintenant proposée pour se dérouler entièrement en juillet et août 2023.

[illegible]

Personnel

Personnel on site: 7

Days on site: 26

Total Person days: 182

Operations Phase: from 2023-07-01 to 2023-07-26

Hulilukaarutit

| Inigiya | Hulilukaarut Qanurittuq | Nunannga Qanurittaakhaanik | Initurlinga qanuritpa | Initurlinga utuqqarnitat unaluuniit Ingilraaqnitat Uyarannuqtut akhuurninnga | Qanitqiyauyuq qanitqiamut nunallaat kitulluuniit ahiruqtaliyainnit nuna |
|--|--|----------------------------|---|--|--|
| Freshwater lakes west of Chesterfield and Rankin Inlets (NTS 55J, K, 55N, 55O) | Scientific/International Polar Year Research | Inuit Owned Surface Lands | No lake sediment and water surveys have been carried out within the boundaries of the survey area by the Geological Survey of Canada. A lake sediment and water survey was carried out by the Geological Survey of Canada on adjoining map NTS map sheets 55M and 65O in 1976, south of Baker Lake. | The helicopter will only land on lakes, at airports and at two cache locations. Archeological sites will be avoided. | The Hamlets of Chesterfield Inlet and Rankin Inlet are located proximal to the survey area. Iqalugaarjuup Nunanga Territorial Park falls within the boundaries of the survey area but only two samples at the edge of the park are proposed. |

Nunaliin Ilauyun, Aviktuqhimayuniitunullu Ikayuuhiarunguyun

| Nunauyuq | Atia | Timiuyuq | Upluani Uqaqatigiyaungmata |
|---------------|-----------------------|---|----------------------------|
| Ikaluktuttiak | Mr. Jorgan Aitaok | Nunavut Tunngavik Incorporated | 2023-02-10 |
| Kangirliniq | Mr. Luis Manzo | Kivalliq Inuit Association | 2023-02-10 |
| Kangirliniq | Mr. Andre Aokaut | Kangiqliniq Hunters & Trappers Organization | 2023-02-10 |
| Kangirliniq | 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 |
| Igluligaaryuk | Mr. Tony Amauyak | Hamlet of Chesterfield Inlet | 2023-02-10 |
| Igluligaaryuk | Mr. John Ivey | Hamlet of Chesterfield Inlet | 2023-02-10 |
| Igluligaaryuk | Mr. Harry Aggark | Aqigiq Hunters and Trappers Organization | 2023-02-10 |
| Igluligaaryuk | Ms. Janice Aggark | Aqigiq Hunters and Trappers Organization | 2023-03-01 |

| | | | |
|--------------|-----------------------|--|------------|
| Qamaniittuaq | Mr. Richard Awksawnee | Hamlet of Baker Lake | 2023-02-10 |
| Qamaniittuaq | Mr. Sheldon Dory | Hamlet of Baker Lake | 2023-02-10 |
| Qamaniittuaq | Mr. Brian Pudnak | Baker Lake Hunters and Trappers Organization | 2023-02-10 |

Angiuttauvaktunik

Naunaiqlugu nunanga talvani havauhikhaq ittuq:

Kivalliq

Angiuttauvaktunik

| Munariniqmut Ayuittiaqtuq | Angirutinga Qanurittuq | Tadja Qanurittaakhaanik | Ublua Tuniyauyuq/Uuktuqtuq | Umikvikhaa Ublua |
|---|---|------------------------------|-------------------------------|------------------|
| Nunavunmi Ihivriunqimut Timiqutigiyanga | Scientific research license application; Physical/Natural Science Research | Applied, Decision Pending | | |
| Kivalliq Inuit Katimayit | Application to Access Inuit Owned land and Water Use | Not Yet Applied | | |
| Indigenous and Northern Affairs Canada | CIRNAC Land Use Application | Not Yet Applied | | |
| Nunavut Imaligiyyit Katimayit | Authorization to Water without a License | Not Yet Applied | | |

Project transportation types

| Transportation Type | Qanuq Atuqtauniarmangaa | Length of Use |
|------------------------|-------------------------|---------------|
| Air | Helicopter | |

Project accomodation types

Nunauyuq

Ihuaqutivaluin Atuqtauyukhan

Hanalrutit atuqtaunahuat (ukuallu ikuutat, pampiutainnik, tingmitinik, akhaluutinik, hunaluuniit)

| Hanalrutit Qanurittuq | Qaffiuyut | Aktikkulaanga – Qanurittullu | Qanuq Atuqtauniarmangaa |
|-------------------------|-----------|------------------------------|--|
| Bell Long Ranger 206-L4 | 1 | Length39 ft 8 in | Equipped with floats for landing on water to collect samples of lake mud and water. Sampling crew will fly from lake to lake within survey area along pre-planned traverses that will loop from the community to the farthest point in the survey area and back. |

Qanurittuq Urhuqyuaq unalu Qayangnaqtut Hunavaluit Aturninnga

| Qanurittuq urhuqyuaq hunavaluit aturninnga: | Urhuqyuaq Qanurittuq | Qaffiuyut qattaryut | Qattaryuk Aktikkulaanga | Atauttimut Qaffiuyut | Ilanga | Qanuq Atuqtauniarmangaa |
|---|----------------------|---------------------|-------------------------|----------------------|--------|--|
| Aviation fuel | fuel | 136 | 205 | 27880 | Liters | 96 drums of fuel for LR206-L4 based in Rankin Inlet.40 drums of Jet-A for LR206-L4 based in Chesterfield Inlet18-sealed drum cache located approximately 80 nautical miles NNW of Rankin Inlet to enhance flexibility, ensure safety |

Imaqmik Aturninnga

| Ubluq qanuraaluk (m3) | Aturumayain imavaluin utiqittagaani qanuq | Atulirumayain imavaluin utiqittagani humi |
|-----------------------|---|---|
| 0 | Tap | Hotel |

Iqqakuq

Ikkakunik Munakgiyauyunik

| Havaulikhaq Hulilukaarut | Qanurittuq Iqqakut | Ihumagiyauyuq Qanuraaluktut Atuqtait | Qanuq Iqqakuurniarmangaa | Halummaqtirarnirutikhan piyutin |
|-----------------------------|-----------------------------|--|------------------------------|------------------------------------|
| Waste disposal | Anaagun (inuin anaaguin) | 225 kg | Municipal waste treatment | None |

Avatiliriniqmut Ayurhautingit:

The predicted environmental effects of this undertaking are mainly related to the noise made by the helicopter. Noise can affect both human health and wildlife, but the effects on both will be mitigated by avoiding residential areas of the communities, parks, and sensitive areas where wildlife might be affected. These areas will be identified prior to the commencement of operations and will be based on consultations with local sources of knowledge. The flight path of the helicopter can be adjusted at any time to mitigate human health risks and wildlife disturbance from noise. Flights to and from the airport at Rankin Inlet or Chesterfield Inlet will not commence before 8 a.m. and will cease by 7 pm at the latest.

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

Qanurittuq Ittunik Avatinga: Avatingalluanga

The proposed area of the lake sediment and water survey is approximately 18,000 km², between 62.5°N and 64°N and 91°W and 94°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 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.

Qanurittuq Ittunik Avatinga: Inuuhimayunut Avatinga

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. 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.

Qanurittuq Ittunik Avatinga: Inungit-maniliurutingit Avatinga

The Hamlets of Chesterfield Inlet and Rankin Inlet are situated at the eastern edge of the survey area. The Hamlet of Whale Cove is located approximately 50 km south of the survey area. The helicopter used for collecting lake sediment and water samples will be based in either Chesterfield Inlet or Rankin Inlet or both communities. Sample collection will be carried out by a company registered with the Inuit Firms Registry (IFR) and proposals are subject the Inuit Benefit Plan directive. Food and lodging for the sample collection crew, helicopter pilot and Geological Survey of Canada (GSC) employee will be purchased from one or both communities of Chesterfield Inlet and Rankin Inlet. An assistant to the GSC employee will be hired from one or both communities. 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.

Miscellaneous Project Information

Emergency Response Plan, Comprehensive Spill Prevention Plan, Wildlife Monitoring and Management Plan (see Project Documents)

Naunaiyainiq ukuninnga Ayurhautingit unalu Piumayaat Ikikliyuumiutinahuarutit

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 with the possible exception of two sample sites. 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 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 is stored in 205 litre (45 gal.) drums at Rankin Inlet airport and Chesterfield Inlet airport. One or two fuel caches of up to 18 drums will be positioned in strategic locations to ensure safe operations in the event of weather emergency situations or to extend flight distances. The drums will be placed on dry well-drained ground at least 31 m from any watercourse or lake. The CIRNAC engineer will be notified within 30 days of establishing the cache. All fuel caches will be removed during the winter in 2024 at the latest.

Tamatkiumayunik Ihuikgutivaktunik

Impacts on the physical and biological environments will be localized, of low-magnitude, reversible and fall within the approximately four-week period of the proposed lake sediment and geochemical survey. 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 250 hours that the helicopter will fly to collect 1,500 lake sediment and water samples, greenhouse gas emissions will be about 67 metric tons, equivalent to 20 gasoline-powered vehicles driven for one year (Natural Resources Canada Greenhouse Gas Equivalencies Calculator; United States Environmental Protection Agency Greenhouse Gas Equivalencies Calculator).

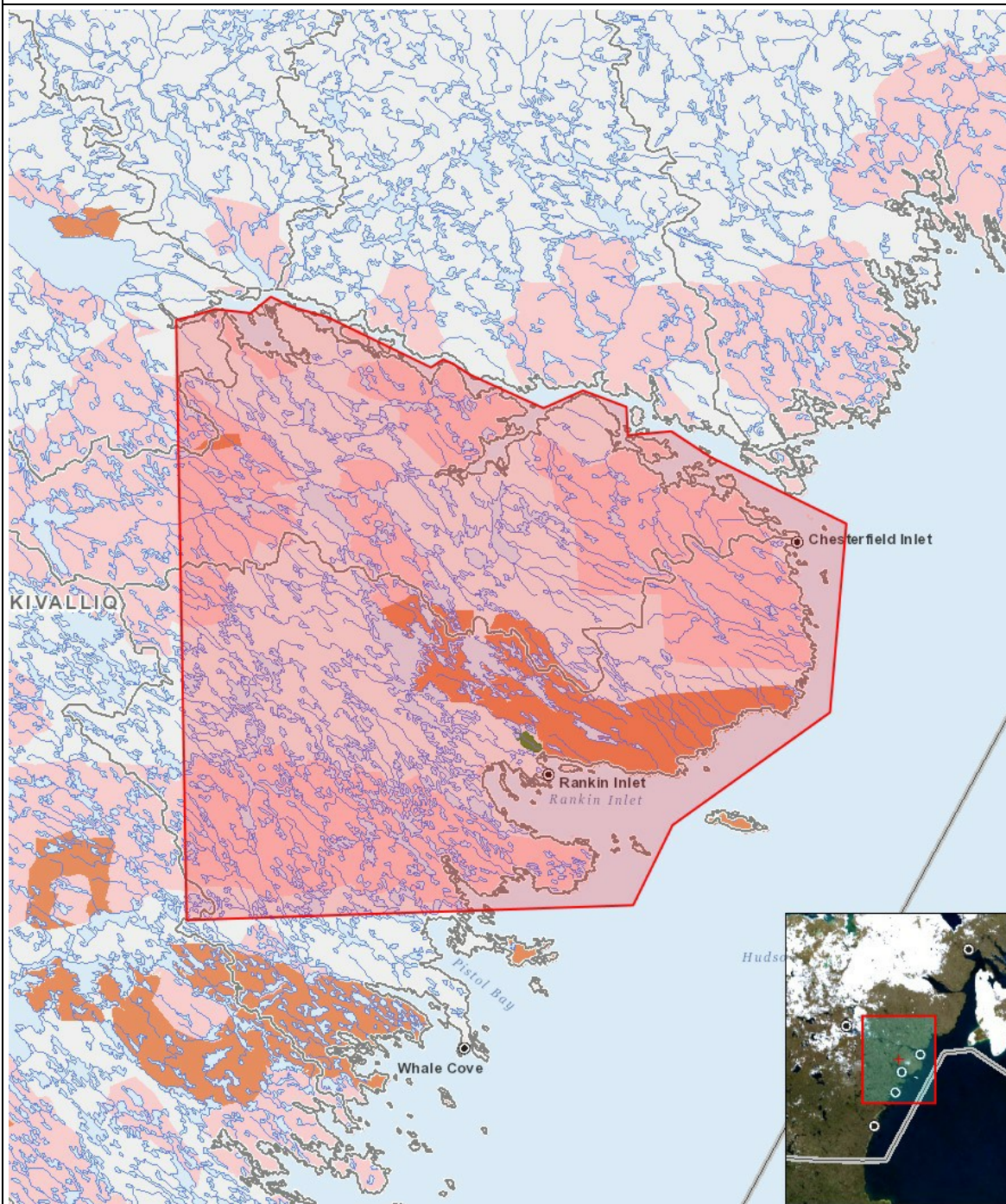
Impacts

Ilitariyauniq Avatiliriniqmut Ayurhautingit

| | | 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 | |
|--|--|----------|--------------------------------|------------------|------------|-----------------------|---------------|--------------------|---|-----------------------------|---------------------------|--------------------------------|-------------|--------------|------------|------------|--|---|---|--------------------------|----------------|--|------------|--------------------|--------------------------|--------------|---|
| Havakvinga | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| - | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | - | - | - | - | | - | - | - | - | - | |
| Aulapkaininnga | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Scientific/International Polar Year Research | | M | - | - | - | - | - | - | - | - | - | - | - | - | M | | - | M | M | - | M | | - | P | - | P | U |
| Piiqtauniq | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| - | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | - | - | - | - | | - | - | - | - | - | - |

(P = Nakuuyuq, N = Nakuungittut unalu mikhilimaittuq, M = Nakuungittut unalu mikhittaaqtuq, U = Naluyauyuq)

Havaariyauyukhamut Nayugaa



List of Project Geometries

1 polygon Freshwater lakes west of Chesterfield and Rankin Inlets (NTS 55J, K, 55N, 55O)