NPC 151156: Gascoyne Inlet Geoscience Project

Close

Proposal Status: Conformity Determination Issued

Overview Documents

Project Overview

Type of application: New

Proponent name:

Rod Smith

Proponent company:

Geological Survey of Canada

Project Description:

The Gascoyne Inlet Geoscience Project is a collaborative effort led by the Geological Survey of Canada in partnership with Defence Research and Development Canada (DRDC) to better understand the land, coast, and seafloor around the Gascoyne Inlet Camp (GIC) on southwest Devon Island. The project brings together three areas of research: marine seabed geology and natural underwater noise, coastal dynamics and nearshore ice, and surficial geology and permafrost conditions to support safe operations, long-term planning, and environmental awareness in this region of the Arctic. Understanding these conditions will help identify natural hazards such as erosion, underwater landslides, and ground ice that could affect infrastructure, including submarine cables and future camp facilities. The work will also improve the ability to distinguish natural underwater noise from human-made signals, supporting safer marine operations and better situational awareness. Fieldwork will take place in August 2026 and 2027 in Gascoyne Inlet and the surrounding region, including Radstock Bay, Cape Ricketts, Beechey Island, and nearby coastal and offshore areas. Each field season will last several weeks, with logistical support provided by PCSP and DRDC.

Project Schedule

Start Date:

2026-07-15

End Date:

2026-09-30

Project Map

List of project geometries:

Id

Geometry

Location Name

21448

polygon

Gascoyne_Quaternary_AOI

21071

point

Gascoyne Inlet Camp

21072

point

Beechey Island

21073

point

GIC-Wedge 1

21074

point

GIC-Wedge 2

21075

point

GIC-Wedge3

21076

point

GIC-Wedge4

21077

point

GIC-Wedge5

21078

point

GIC-Wedge6

21079

point

GIC-Wedge7

21080

point

GIC-Wedge8

21081

point

Wedge terrace

NPC Planning regions:

North Baffin

Project Land Use and Authorizations

Project Land Use:

Scientific Research

Scientific Research

Licensing Agencies:

Nunavut Research Institute

Qikiqtani Inuit Association

Nunavut Impact Review Board

Government of Canada - Fisheries and Oceans Canada

Material Use

Equipment:

Type

Quantity

Type

Use

Drone (Model TBA)

1

TBA

Capture high-resolution aerial imagery to map landforms and document terrain and coastal features, to compare past and present conditions.

Multi-beam / Single-beam Sonar

1

Transducer and console dimensions to be confirmed

An acoustic mapping system mounted on a vessel. It emits sound pulses downward, and the returning echoes reveal water depth and seabed shape. Used to create detailed seafloor maps, identify features, and support studies of sediment movement and seafloor stability.

Acoustic Doppler Current Profiler (ADCP)

1

20x30cm

An underwater instrument that emits sound beams into the water column. Changes in the returning signal show current speed and direction. Used to understand water movement, sediment transport, and processes that affect coastal and seafloor conditions.

Handheld Drill (Permafrost Cores)

1

40x20cm

A lightweight drill used to take shallow cores (<3 m) from frozen ground. It collects sediments and ice for analysis to assess ground stability, permafrost conditions, and local soil properties important for safe infrastructure planning.

Sub-bottom profiler

1

25-40cm

A low-frequency acoustic system that sends sound pulses into the seabed. The echoes reflect off sediment layers, creating profiles of shallow geology. Used to study subsurface structure, identify buried features, and assess seafloor stability and sediment behavior.

Conductivity–Temperature–Depth (CTD) Data Logger

1

30x7cm

A sensor lowered through the water that measures conductivity, temperature, and depth. These values describe water column structure and conditions that influence sediment transport, freezing and thawing near the seabed, and other marine processes.

Helicopter (Bell 206L)

1

25 Hours

5 days of helicopter use will support access to sites of interest for observations, sample collection, and ground-temperature measurements as part of Quaternary and permafrost field studies. Helicopter support will be provided by PCSP. The helicopter will be based at DRDC's Gascoyne Inlet Camp, taking daily flights out and returning to the camp at the end of each day. The helicopter will return to PCSP Resolute's base at the end of the 5 days.

Nuliajuk Research Vessel

1

64ft

The Nuliajuk vessel will be used to map the seafloor with sonar and deploy instruments to record natural seabed movements. This work will help identify unstable areas such as potential landslides, sediment flows, and freeze–thaw zones.

Ground Penetrating Radar (GPR)

1

50 lbs

Used to image shallow subsurface layers on land. Helps identify permafrost conditions, buried ice, and sediment structures, and supports studies of how coastal and terrestrial terrain is changing over time.

Fuel Use:

Type

Container

Capacity

Use

Aviation fuel

22

205

With PCSP Support, 22 drums of Jet-B Fuel will be transferred to and stored at the DRDC Gascoyne Inlet Camp (GIC) facility to support helicopter activity. Fuel stored at the GIC will be kept in sealed steel drums placed in accordance with CIRNAC guidelines, with spill response equipment readily available. All drums will be removed at the conclusion of the field program and returned to Resolute Bay for proper disposal.

Hazardous Material and Chemical Use:

Type

Container

Capacity

Use

No data found

Water Consumption:

Daily Amount (m^2)

Retrieval Method

Retrieval Location

0

Waste and Impacts

Environmental Impacts:

The proposed project is anticipated to generate limited and short term impacts on Nunavut residents, wildlife, and the environment. Temporary disturbance may occur from helicopter operations, vessel engine noise, and ship movements near the coast or landing areas. These activities may cause brief displacement of marine mammals, seabirds, and terrestrial wildlife. Minor, localized vegetation impacts may occur from short duration foot traffic at landing sites. There is a low possibility of unintentionally encountering culturally sensitive areas or unrecorded heritage sites during field operations. The handling and storage of fuel at the Gascoyne Inlet Camp (GIC) also carries a low environmental risk. Overall, all potential effects are expected to be site specific, low in magnitude, reversible, and limited to the period of project activity. A comprehensive set of mitigation measures will be implemented to avoid and reduce disturbance. Through community engagement with Resolute Bay, culturally sensitive areas will be identified and fully avoided, and any newly encountered cultural sites will result in immediate cessation of activity, documentation, and reporting to relevant authorities. To minimize wildlife disturbance, helicopters will fly at altitudes of 1,000 feet or higher and will not land if wildlife is present; such sites may be revisited later following guidance from a wildlife monitor. Vessel operations will follow marine wildlife best practices, including reducing speed near sensitive areas, avoiding abrupt course changes, and minimizing engine noise where operationally feasible. Ship travel routes will avoid known wildlife aggregation areas, and marine mammals will be given wide buffers to reduce disturbance. On land, crews will travel on foot within a limited radius of the aircraft, avoid fragile environments such as wetlands, and document all wildlife observations. All small waste will be collected and transported back to the GIC for appropriate disposal. Fuel stored at the GIC will be kept in sealed steel drums placed in accordance with CIRNAC guidelines, with spill response equipment readily available. All drums will be removed at the conclusion of the field program and returned to Resolute Bay for proper disposal.

Waste Management:

Waste Type

Quantity Generated

Treatement Method

Disposal Method

No data found