



## **NIRB Application for Screening #125445**

### **Periglacial Geomorphology and ground ice investigation in the Haughton impact structure area, Devon Island, Nunavut**

**Application Type:** New

**Project Type:** Scientific Research

**Application Date:** 2/8/2019 1:26:56 PM

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

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

**Project Proponent:** Etienne Godin  
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## DETAILS

### Non-technical project proposal description

- English: Title: Periglacial Geomorphology investigation study in permafrost at the Houghton impact structure and surrounding terrains, Devon Island, Nunavut Our objective this year is to investigate the underground in relation to the periglacial landforms and ground ice using a geophysical approach such as field sampling, ground surveying and mapping with a focus on in-crater and out of crater differentiation.
- French: Titre: Periglacial Geomorphology investigation study in permafrost at the Houghton impact structure and surrounding terrains, Devon Island, Nunavut Cette année notre objectif est d'étudier la proche surface du sol et la dynamique périglaciaire et des coins de glace en utilisant une approche géophysique, comme l'échantillonnage de terrain, l'utilisation de géoradar et la cartographie en utilisant une approche de différenciation du terrain intra-cratère versus extra-cratère.
- Inuktitut: I included an Inuktitut non-technical summary with the application

### Personnel

Personnel on site: 4

Days on site: 19

Total Person days: 76

Operations Phase: from 2019-07-17 to 2019-08-04

## Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Haughton River Valley Camp	Camp	Inuit Owned Surface Lands	This site is used for research since the late 1990's	None	Grise Fjord and Resolute are several hunder km from the location
Haughton Crater Area (big polygon); Orbiter Lake and Lake Comet (small circles)	Researching	Inuit Owned Surface Lands	Orbiter and Comet lake are desert. Haughton River Valley was studied since the late 1990's and the Haughton Formation since the 1980's	No know archeological sites. There is fossil rich layers in the Haughton Formation in the SW of the crater: we will not go there.	Grise Fjord and Resolute are several hunder km from the location

## Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Information is not available			

## Authorizations

Indicate the areas in which the project is located:

North Baffin

### Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Nunavut Water Board	Approval for the use of waters and deposit of waste without a license 8WLC-DIS1920	Active	2019-04-12	2020-04-11
Nunavut Research Institute	Investigate the periglacial landscapes in and near the Houghton Impact Structure #02 021 19R-M	Active	2019-02-25	2019-12-31
Qikiqtani Inuit Association	Investigate the periglacial landscapes in and near the Houghton Impact Structure	Applied, Decision Pending		

### Project transportation types

Transportation Type	Proposed Use	Length of Use
Air	Twin Otter to open and then close the camp	
Land	ATV's and walking on the site depending on distance to point of interest	

### Project accommodation types

Temporary Camp

## Material Use

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

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Kawasaki Bayou	2	1.75x1.0x1.0 m, 185 kg	Travelling to sites too far to be accessed by walking
Honda Generator	1	0.5x0.3x0.4 m, 22 kg	Powering and charging electronic equipment
Coleman Stoves	2	0.6x0.1x0.3 m, 6 kg	Cooking food and boiling water
Badger Auger	1	0.5x0.4x0.4	For accessing deeper (~1 m) soil horizons
Portable Drill	1	1 m 30 kg	Small man portable CRREL drill for shallow soil drilling. (max depth is 2.5 m)
Ground Penetrating Radar	1	40 kg	This is a passive instrument to look at underground ice with antennas.

### Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Gasoline	fuel	10	20	200	Liters	Refuel ATV, generator
Aviation fuel	fuel	4	55	220	Gallons	Aircraft Refuel
Propane	fuel	3	20	60	Lbs	Heating, Cooking
Oil	fuel	1	1	1	Liters	Engine Maintenance

### Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
0	We go toward the stream with clean water bottles and we refill	The Haughton River is a pretty large river about 1 km from the base camp location

# Waste

## Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Camp	Combustible wastes	50 kg	Waste will be stored and carried back to Resolute for proper disposal.	N/A
Camp	Greywater	20 L per day	Greywater will be disposed in a sump pit in the permafrost near the camp.	The pit will be refilled before leaving to leave no trace.
Camp	Non-Combustible wastes	50 kg	Such waste will be stored and carried back to Resolute for proper disposal.	N/A
Camp	Sewage (human waste)	3 kg per day	Pit dig in the permafrost, more than 1 km from nearest stream. This pit is near the camp, in an old river deposit (block, pebble and sand).	Paper and tissues are whenever possible bring back to Resolute for incineration. Pit will be refilled before leaving to leave no trace

### Environmental Impacts:

While in Resolute we will go to the Tudjaat COOP to buy supplies (food) and some camp equipment. In the field the camp is on an old river bed (present river at 1 km from the site). This site has been in use for more than a decade for camp during summer and we reuse the same area to prevent local disturbance spreading. The place will be clean-up (pits refilled, garbage out) before we leave. During research we use ATV in trails or over hard rock to prevent tracks. We are careful/proactive to not disturb wildlife.

# **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**

**Description of Existing Environment: Biological Environment**

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

**Miscellaneous Project Information**

**Identification of Impacts and Proposed Mitigation Measures**

**Cumulative Effects**



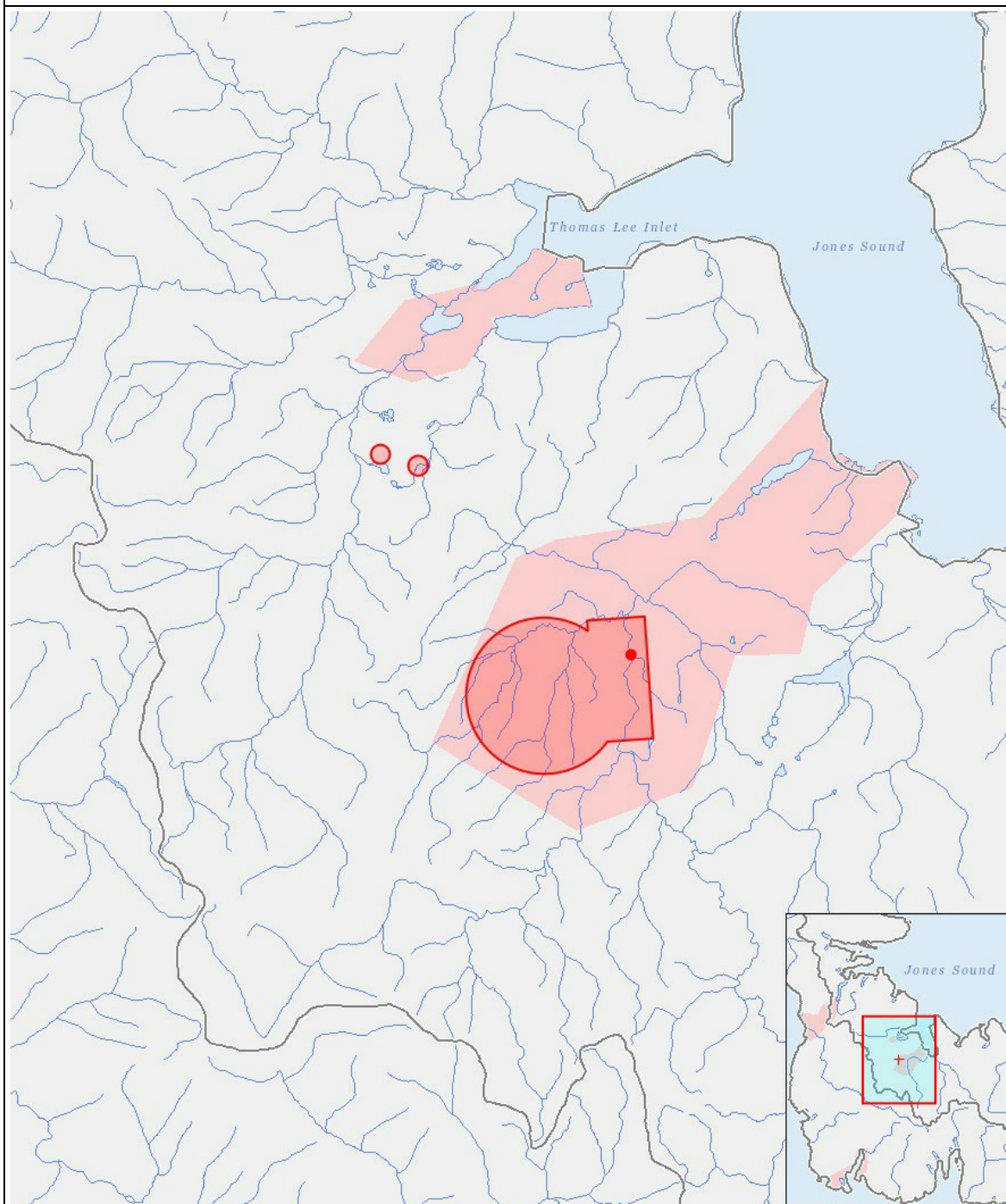
# Impacts

## 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																								
		Brds, 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																										
Camp		M	-	-	-	-	-	-	-	-	M	-	-	-		-	-	-	-	-		-	P	-	-	-
Researching		M	-	-	-	-	-	-	-	-	M	-	M	M		-	-	-	-	-		-	P	-	-	-
Decommissioning																										
-			-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-

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

## Project Location



## List of Project Geometries

- |   |         |   |
|---|---------|---|
| 1 | polygon | Haughton Crater Area (big polygon); Orbiter Lake and Lake Comet (small circles) |
| 2 | point   | Haughton River Valley Camp  |