

NPC 150932: Arctic Ice Thickening Field Test Qikiqtarjuaq

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**Proposal Status: Conformity Determination Issued**

[Overview Documents](#)

[Project Overview](#)

Type of application: Amendment

Proponent name:

Tom Meijeraan

Proponent company:

Arctic Reflections

Project Description:

The Arctic is warming faster than other parts of the world, causing sea ice to melt earlier each year. This affects wildlife, the climate, and the way people in Nunavut travel and hunt. One cause of this melting is that darker ocean water absorbs more heat than bright white ice. When sea ice disappears, the ocean warms even faster. To help reduce this warming, our team from Arctic Reflections is testing a method called Arctic Ice Thickening. The idea is simple: in winter, we pump seawater onto the ice surface, just like the way ice roads are constructed. The cold air freezes the water and makes the ice thicker. Thicker ice may last longer in the spring and summer, helping to prolong the sea ice cover. Our research will take place near Qikiqtarjuaq in winter 2026 and 2027. We want to find out: •Does the method work in Nunavut conditions? •How much does the ice actually thicken? •How long does the thicker ice last? •Does it affect local wildlife or the environment? If Arctic Ice Thickening works, it could help keep sea ice in place longer—supporting local travel routes, hunting, and wildlife and preventing the ocean from warming even faster. It's a low-tech idea based on traditional ice road building, but we're testing it for a new purpose: slowing down sea ice loss. With the results of this field test, we hope to better understand if this could be part of a solution to Arctic climate challenges. The field test will happen on the sea ice to the west of Broughton Island, north of Qikiqtarjuaq. The exact spot will be chosen in collaboration with the Hunters & Trappers Organization, staying away from areas where animals are known to gather. We plan to do most of the work in February 2026 and 2027, when there is enough daylight and the ice is thick and safe. The work will take about 4–5 weeks each year, including setup, pumping, and cleanup. Monitoring of the ice will continue until summer, using equipment that can float and be tracked by GPS. Our team

(6-8 people) will:

- Use snowmobiles and sleds to carry pumps and equipment
- Drill holes in the ice and pump seawater onto the surface
- Repeat this over an area of about 1 km<sup>2</sup>
- Monitor ice thickness using smart sensors, weather stations, and visual checks, both of the thickened area as for non-thickened ice for comparison reasons
- We will work only during the day, to avoid disturbing wildlife. All travel to and from the site will use the same marked path. Waste will be brought back each day. Refueling of snowmobiles will only happen in Qikiqtarjuaq, not on the ice. For the pumps we will only have to replace jerrycans to refuel to avoid spills. We are committed to working closely with the Qikiqtarjuaq community. Wildlife monitors/guides and field ice observers will be hired during the project. We plan to:
- Share our results with the Qikiqtarjuaq Hunters & Trappers Organization
- Provide summaries in plain language and visual formats
- Visit Qikiqtarjuaq before the start of the field test for further community consultation and afterwards to present findings and hear community feedback
- Make our data available to Nunavut researchers and decision-makers and investigate if we can make all ice thickness data available via the Siku platform to the local community.

### [Project Schedule](#)

Start Date:

2026-02-01

End Date:

2026-07-31

### [Project Map](#)

List of project geometries:

Id

Geometry

Location Name

[18985](#)

polygon

Operational zone 1 (field test site will be max 1 km<sup>2</sup> within either zone 1 or 2) - backup location only

[18988](#)

polygon

Operational zone 3 (field test site will be max 1 km<sup>2</sup> within zone 3) - preferred location after in person meeting HTO & Hamlet at 10th of Sept 2025

NPC Planning regions:

### **No Approved Plan**

#### Project Land Use and Authorizations

Project Land Use:

Scientific Research

Licensing Agencies:

Nunavut Research Institute

#### Material Use

Equipment:

Type

Quantity

Type

Use

Pump (EMV-690 ice road pump)

3

166x80x80cm

Pump seawater from below the ice onto the ice to thicken the ice

Drill (10 inch ice auger, electric)

3

129x39x29 cm

Manually drill holes in the ice to allow the pump to extract water

Sled

3

250x100x50cm

The sled is currently still under design and dimensions can still change a bit. The sled is specifically designed to carry a pump and to lower and lift the pump in the hole drilled by the auger.

Smart buoy (SIMB3)

2

244x33x30cm

The SIMB3 is a buoy designed to measure ice thickness and solar reflection

SAMS SIMBA

2

52x46x22cm

The SAMS SIMBA is a snow and ice thickness measurement apparatus. It comes with a thermistor chain that will be installed in the ice and measures water, ice, snow and air temperatures.

Anemometer

1

40x15x10cm

Measure wind speed, wind direction, air temperature

Data logger

2

40x15x10

Device to store and transfer data from anemometer and radiometers

Radiometer (Apogee FN-500)

2

40x40x10cm

Scientific device measuring incoming and outgoing shortwave and longwave radiation (to measure reflection of solar energy by the ice)

Timelapse camera

2

30x30x15

Timelapse camera to take pictures every x hours to see how the ice melts during the melting season and to visually validate and explain the data coming from the scientific instruments

Floating platform

2

150x50x40cm

Floating platform consisting out of 6 plastic floating cubes (50x50x40cm each) assembled together to keep our scientific instruments floating when the ice starts to melt in summer. Each carries 1 SAMS SIMBAs, 1 data logger, 1 radiometer and 1 timelapse camera.

Skidoo

3

330x120x140cm

Snowmobiles will be leased to transport of our research group to and from the site of operations and to tow the sleds carrying the pumps.

Fuel Use:

Type

Container

Capacity

Use

Gasoline

125

20

We will use gasoline to power the pumps. To prevent spills, refueling on the sea ice will be done by simply swapping out empty 20-liter steel jerrycans for full ones—eliminating the need to pour or pump fuel on the ice. All jerrycans will be refilled exclusively in the hamlet

Hazardous Material and Chemical Use:

Type

Container

Capacity

Use

No data found

Water Consumption:

Daily Amount (m<sup>2</sup>)

Retrieval Method

Retrieval Location

0

### Waste and Impacts

Environmental Impacts:

Due to the limited area (1km<sup>2</sup>) where we plan to thicken the ice, the impact on the physical environment is expected to be minimal and can be compared to the creation of ice roads. A hole is drilled through the ice, after which a pump is placed into the hole to pump water on top of the ice, which will freeze rapidly and leads to thicker ice. Both drilling and pumping will make noise, which could disturb local wildlife and thus also local hunting and trapping activities. To avoid such disruption, the exact field test location will be determined in close collaboration with the Hunters & Trappers Organization just before the beginning of the test. Monitors will continuously assess the site, and all activities will pause if wildlife is observed nearby, resuming only after they've left. Operations are planned for February to avoid disturbance due to artificial light in the polar night. High-flow pumps and electric drills will minimize operational time and noise. Snowmobile traffic will be limited to a single, marked route to reduce disturbance. All waste will be collected and returned to Qikiqtarjuaq daily. Any measurement equipment left on the ice will be properly secured, floatable, GPS-trackable, and clearly marked with our contact information to ensure safe recovery after the test period. Snowmobile refueling will only occur in the village, eliminating spill risks on the sea ice. The gasoline-powered pumps, designed for ice-thickening, hold 20 liters of fuel and require at most one refueling per day. This will be done by swapping full 20-liter steel jerrycans, avoiding the need to pour fuel on the ice. At the end of the season, we will recover all remaining buoys and floating platforms to ensure minimal long-term environmental impact.

Waste Management:

Waste Type

Quantity Generated

Treatment Method

Disposal Method

No data found