

Overview

Interest is increasing in the development of natural gas reserves in the Inuvialuit Settlement Region, with the recent completion of the Inuvik Tuktoyaktuk Highway (ITH) and the decline of the Ikhil Gas wells.

As part of the feasibility studies to assess possible future land developments, ATCO Midstream NWT Ltd. (ATCO), a partner in Inuvik Gas Limited, completed several environmental and geotechnical feasibility studies during August 2018. The Summer 2018 Field Studies were intended to help determine the feasibility of possible future development in a Study Area south of Tuktoyaktuk.

The Study Area was located within Inuvialuit Private 7(1)(a) Lands west of the ITH and approximately 12 to 16 km south of Tuktoyaktuk.

The Summer 2018 Field Studies included four environmental, two engineering and one archaeology / heritage study as follows:



Geotechnical

To study the permafrost and local soil conditions.



Fisheries

To identify fish and/or fish habitat in a local creek.



Vegetation

To identify and map the presence of any rare or 'at risk' plant species or communities.



Surface Water

To determine stream size, flow, and basic water characteristics.



Wildlife

To identify the presence of endangered, or protected animals and birds.



Archaeological

To identify and map the presence of any heritage or cultural resources.

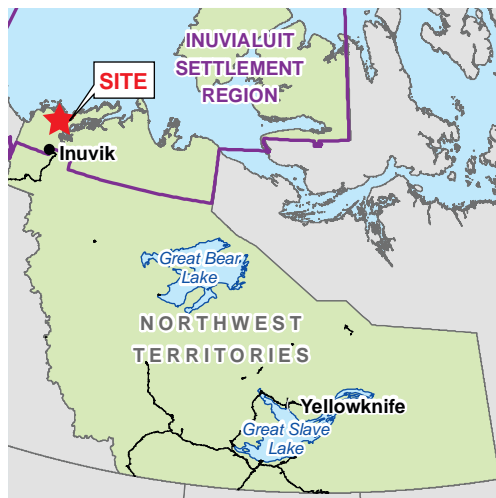


Geomatics

A survey of the ground and lakes to provide height and depth data. Maps can be made available on request.

If the other engineering and economic studies recommend additional investment, the Summer 2018 Field Studies will be used as a basis for engagement with the local communities, leaders and regulators.

The results of the Summer 2018 Field Studies show that the development of the area can be done in a manner that would protect the environment. The studies also provide useful information for community engagement and planning.

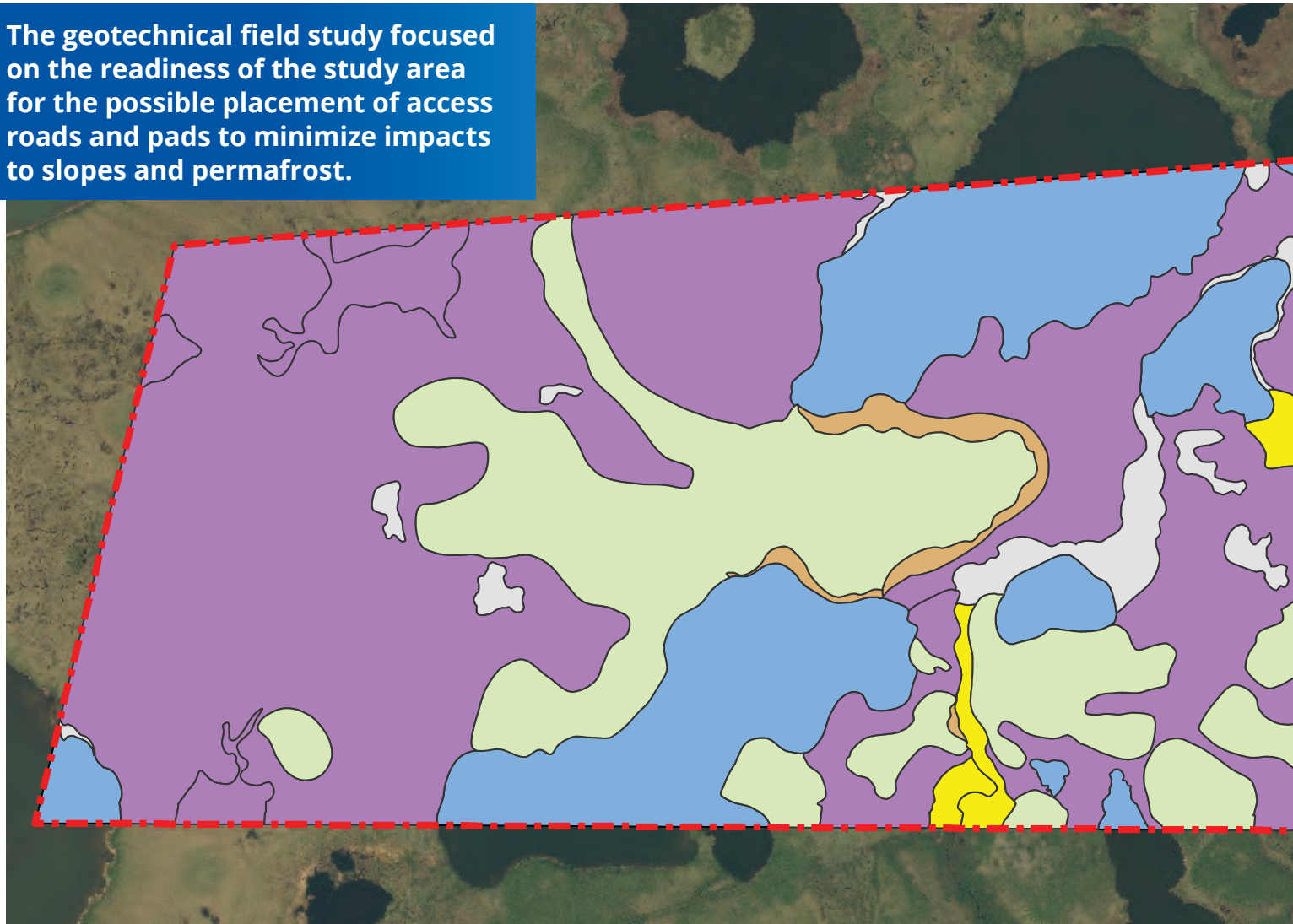


This Summary Report provides the key findings from the Summer 2018 Field Studies.



Geotechnical Study

The geotechnical field study focused on the readiness of the study area for the possible placement of access roads and pads to minimize impacts to slopes and permafrost.



The geotechnical study focused on the readiness of the Study Area for the possible placement of gravel access roads and pads. The study used satellite images to put together a map of the terrain and landforms. Professional Engineers from Kiggiak EBA, assisted by local residents of Tuktoyaktuk, surveyed the area on August 26, 27, and 28, 2018. Numerous small soil samples were obtained for laboratory tests and the

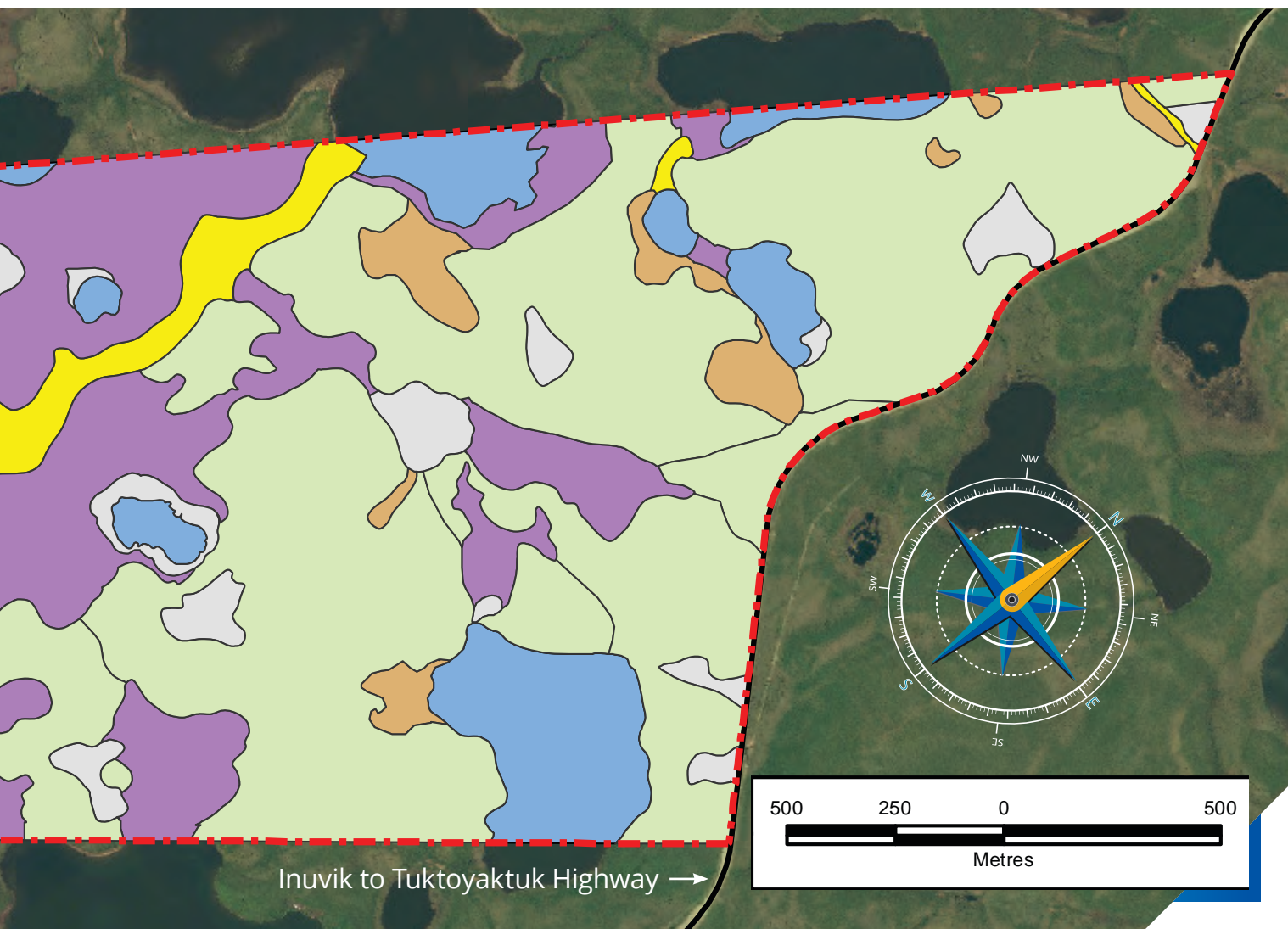
depth of the permafrost was probed in various locations.

The study results provided valuable initial information to help with potential future planning for the Study Area including:

- potential gravel access road routes through the study area;
- potential gravel road tie-in/ pullout locations into the study area from the ITH;
- potential gravel pad and

building / equipment locations;

- investigating the physical condition of an existing sump in the study area;
- protection planning of permafrost and surface drainage; and,
- the best location to protect and cross the small unnamed creek in the study area.









In addition to the lakes and streams found in the study area, 5 main types of surface materials were discovered in the Study Area. These surface materials are shown in the image (above) and described in the legend (right).

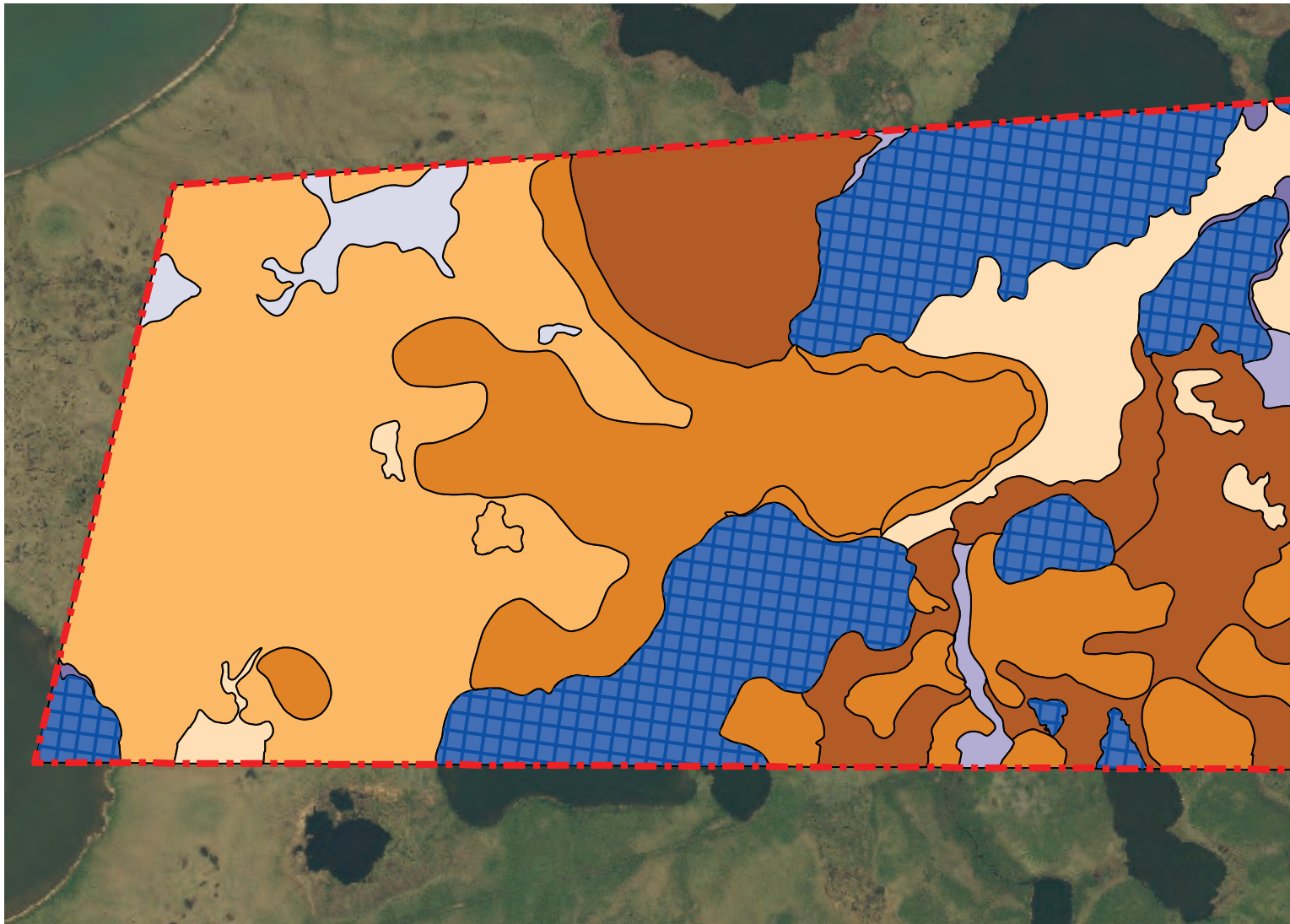


LEGEND

Surficial Material

-  Organic (Peat or wetlands with poorly drained sediments underneath).
-  Colluvial (Material from creeping, slumping or debris flow)
-  Fluvial (Sediment deposited by small streams)
-  Lacustrine (Sediment from pre-historic lake beds)
-  Till (Very poorly sorted sediment left behind by glaciers)
-  Water

Vegetation Study



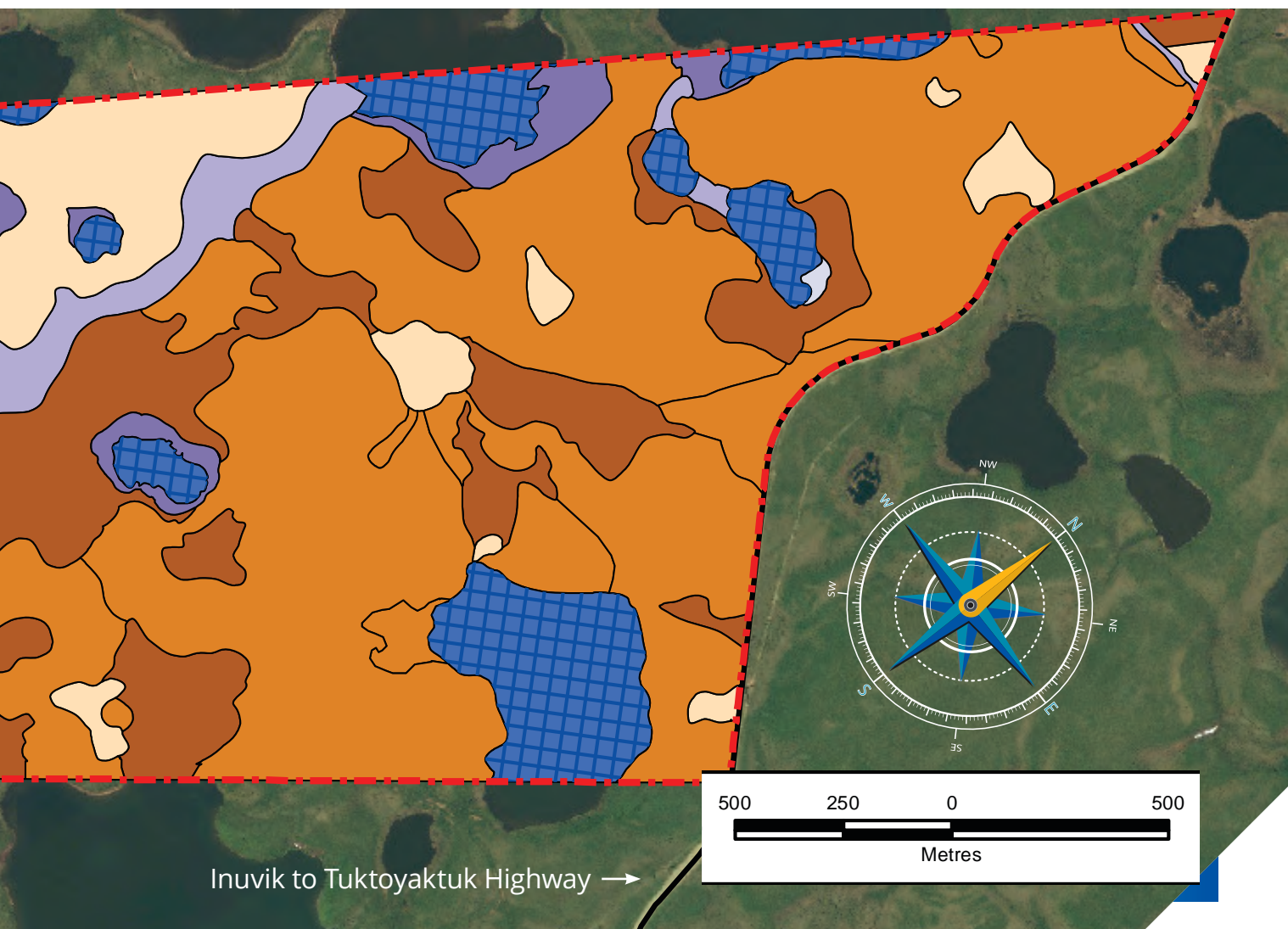
The Tuktoyaktuk Community Conservation Plan, the NWT Species at Risk Infobase, previous impact assessments and other references were used to gather background information. This information was used to identify potential rare plants or rare plant habitats in the Study Area.

Fifty plant species were listed as 'of interest' by the NWT Species at Risk Infobase in the Southern Arctic Ecozone, which includes species within the Study Area.

Nine communities of vegetation types were identified within the Study Area. The most common vegetation types were Upland Shrub (33%), Dwarf Shrub Heath (22%), Water (16%),

High Centered Polygons (15%), and Cotton Grass-Tussock (10%). Together, these vegetation types add up to 96% of the Study Area. Common plants encountered were willows, blueberries, green alder, labrador tea, dwarf birch, bearberry, crowberry, cloudberry, and cotton grasses.

Field assessments were carried out by a professional biologist from Kiggiak EBA, assisted by local residents of Tuktoyaktuk, on August 14 and 15, 2018. Thirty six locations were assessed for vegetation type and rare plant potential. No rare plants were detected during the field assessment.



LEGEND

Dominant Vegetation Type

- Dwarf Shrub Heath
- Upland Shrub
- Cotton-Grass-Tussock
- Water

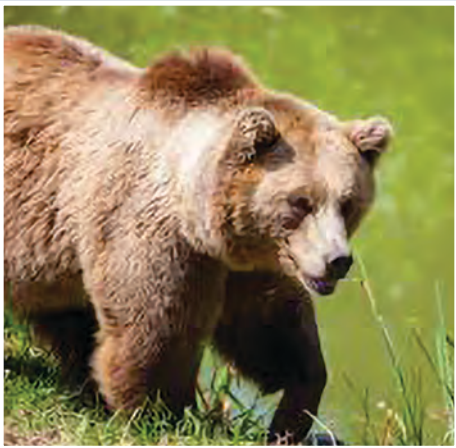
- High-centred Polygon
- Low-centred Polygon
- Riparian Shrub
- Riparian Sedge-Cotton-Grass



Dwarf Shrub Heath



Short-eared Owl



Grizzly Bear



Upland Shrub



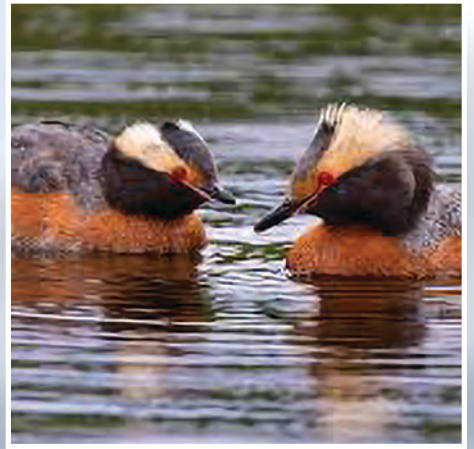
Arctic Cottongrass



Rusty Blackbird



Harris Sparrow



Horned Grebe



Red-necked Phalarope



Alpine Bearberry

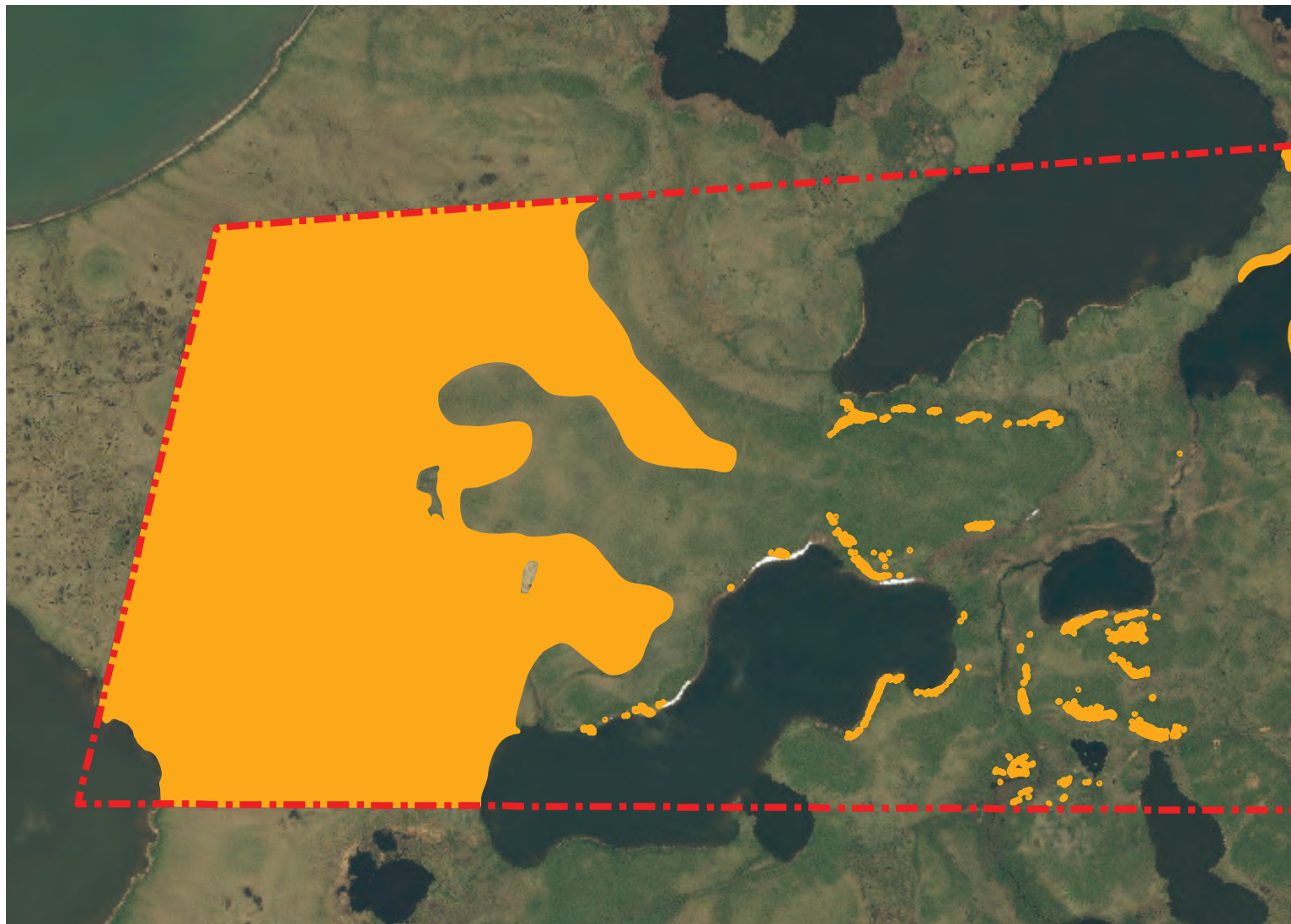


Barren Ground Caribou



Wolverine

Wildlife Study



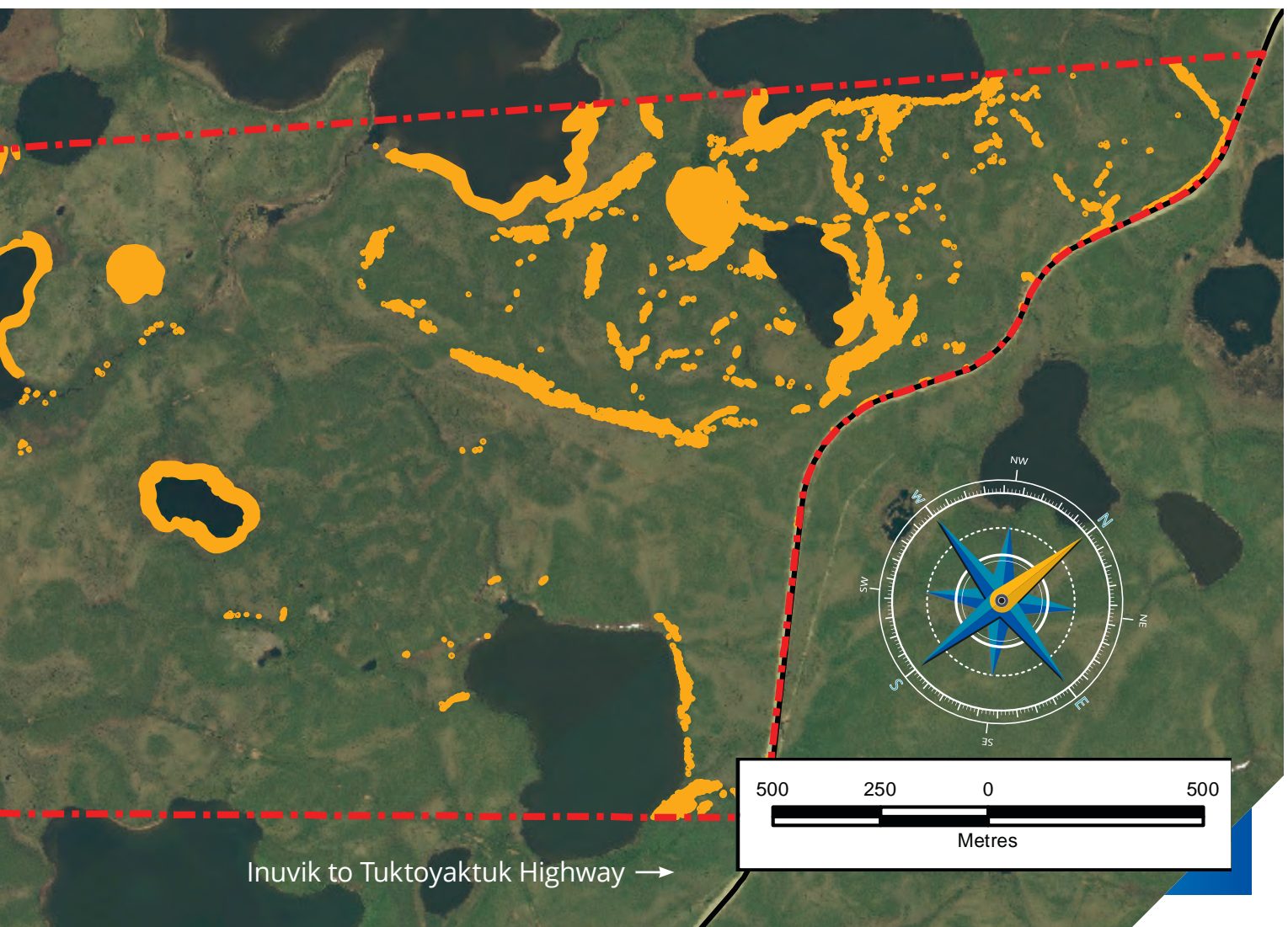
The wildlife survey was conducted on August 14-15, 2018 by professional biologists from Kiggiak EBA with the assistance of local residents of Tuktoyaktuk.

The objectives of the study were to identify wildlife habitats and signs of wildlife, and to describe how well the habitat, in its current condition, would provide for select species.

Eleven species with special conservation status have the potential to occur within the Study Area. The Study Area provides suitable habitat for only eight (8) of those species: Horned Grebe, Red-Necked Phalarope, Short-eared Owl, Harris's

Sparrow, Rusty Blackbird, Barren-ground Caribou, Grizzly Bear, and Wolverine. Evidence of Grizzly Bear and Barren-Ground Caribou were observed in the Study Area during the field survey.

Grizzly Bear, Wolverine, and Barren-ground Caribou could occupy all habitat types within the Study Area at any time of the year. These species have extensive home/annual ranges, extending well beyond the boundaries of the Study Area. Suitable habitat available within the Study Area is also common throughout the Region. However, Traditional Knowledge holders have indicated that Husky Lakes, east of the Study Area, is a particularly important area for many species



including Peregrine Falcon, Barren-ground Caribou, and Grizzly Bear.

The wildlife study concluded that any development in the study area should be completed outside the bird nesting period (mid-May to mid-August) to the extent possible, and a fall survey for grizzly bear dens should be completed prior to any winter construction.

LEGEND

- Study Area
- High Quality Habitat Suitability

Areas of high suitability habitats for one or more species within the study area are shown in yellow on the map above.

Fish & Surface Water Studies

Sixteen percent (16%) of the Study Area is water. There are 2 unnamed creeks and 2 unnamed small lakes in the study area, as well as 7 ponds.

In order to assess the potential for development in the Study Area, the southern unnamed creek was surveyed, as it is possible this creek would need to be crossed. ATCO hired Kiggiak EBA to study the conditions of the creek, its quality for fish habitat and to find out if fish were present. A professional fisheries biologist, with several local residents of Tuktoyaktuk, surveyed the creek on August 14 and 15, 2018.

Field sampling discovered Northern Pike in both stream sections, upstream and downstream of the pond, and Ninespine Stickleback in the stretch downstream of the pond. The study determined that the unnamed stream could possibly support fish species common to the area during the open water season but is unlikely to provide any overwintering habitat as the stream is shallow and likely to freeze to bottom. The upstream section was only 38cm deep on average and the downstream section was 22cm deep on average.

Our study concluded that the stream may be used for spawning by Northern Pike and other species that prefer vegetated areas, such as Ninespine Stickleback, but is poor spawning habitat for salmonids given the lack of gravel/cobble at the bottom of the creek. In addition, any future designs for creek crossing will need to be located and sized to allow for fish movement and larger water flows during spring melting and runoff.

A map showing the location of the creek and the sampling locations is provided on page 13.



Northern Pike



Ninespine Stickleback



LEGEND

- Study Area
- Minnow Trap
- Water Speed Measuring Location
- Fish Habitat Assessment & Electrofishing Area
- ~ Watercourse

The unnamed stream is unlikely to provide any overwintering habitat and provides limited spawning habitat for salmonids given the general lack of gravel/cobble at the bottom of the creek.

Archaeology Study

Using information from numerous previous studies in the area, ATCO hired a professional archaeologist, licensed in the NWT by the Prince of Wales Heritage Center, to review all known information about discoveries in the Study Area and the greater Region (within 50 km); and to assess the Study Area for potential sites (Areas of Archaeological Potential or AOPs) that might have been previous camps or places where people harvested or used minerals, vegetation or animals.

The Study Area, as part of the Tuktoyaktuk Peninsula, has a rich and interesting history. The Tuktoyaktuk Region has been occupied over time by various culture groups / traditions who adapted to their environment in different ways and at various times. Table 1 provides an overview of the Tuktoyaktuk Peninsula's pre-historic and Historic Periods.

Heritage resources previously discovered within 50 km of the Study Area include: lithic scatters, quarries, and workshops; tent rings; rock piles for markers or stashes; fire hearths and fire cracked rock; cabin and house remains; cache (stash) pits; waste heaps; graves; and various types of wood features.

There are five previously recorded archaeological Inuvialuit sites within 5 km of the proposed study area that represent prehistoric campsites and include the remains of fishing practices. The sites are located at elevations of 15 m above sea level or higher and associated with large water bodies to the east and west of the Study Area. Big Lake, located to the south-east of the Study Area, is an important water body used for a considerable

period. High landforms in the area that provide excellent vistas were likely used as part of a travel route towards the Mackenzie Delta to the west.

In general, the best areas for archaeological potential represent elevated terrain near water. No further work is recommended for areas identified as low archaeological potential; these areas include sloping, poorly drained, and generally featureless terrain.



Credit: S. Irving/PWNHC

Our study found that no previously recorded archaeological sites conflict with the potential development of the Study Area. However, any development should include a “chance-find” procedure that would guide what to do in the event of any unexpected discoveries.

Table 1: Overview of the Study Area's Occupation

Cultural Affiliation	Cultural Material	Location	Approximate Time Period
Northwest Microblade Tradition	Burins, blades, microblade	Mackenzie valley, Eastern Mackenzie delta, Cape Bathurst	Seasonal northward movement of interior people to hunt caribou and muskox as old as 6,000 years
Paleoeskimo	Pre-Dorset or Arctic Small Tool tradition (ASTt)	Mackenzie Region	3,000 years ago
Inuvik Phase	Regional variant of the ASTt, characterized by microblades, burins, and small finely worked bifaces	Southeast portion of the Mackenzie Region	4,300 - 3,400 years ago
NeoEskimo (Siglit) Western Thule	Driftwood houses, whaling	Western Arctic	1,500 - 150 years ago
Thule	Whaling related, multiple room wood houses, pottery, harpoons and arrowheads	Eastward migrations from northwest Alaska	1,000 years ago
Mackenzie Inuit (derived from Thule)	Trading and cultural ties to the Alaskan Inuit	Descendants include Inuvialuit residents of the Mackenzie Delta	600 - 150 years ago
European Exploration	Trading goods	Mackenzie River Delta	Post 1789
Whaling	Trading goods related to whaling	Herschel Island, Baillie Islands	1889 - 1914
Trapping and Settlement	Primarily related to fur trapping	Herschel Island, Pokiak Point, Aklavik, Sachs Harbour, Ulukhaktok, Paulatuk	1915 - 1950
Militarization	Government driven "Northern Vision"	Displacement of Aklavik to Inuvik	1953
Oil Exploration and Development	Geophysical and Oil and Gas infrastructure	Inuvialuit Land	1950 - 1990, 1999 - 2002
Modern	Development of Infrastructure - Construction of ITH	Northwest Territories	2014 - 2017