

Bedding Mapping at Uvauk Bay

Geological Survey of Canada

Objectives:

- To complete a bedrock mapping survey in the area near Uvauk Bay along Chesterfield Inlet, in the eastern area of the Kivalliq region.
- Determine the types and structure of rocks in the area.
- Collect small (fist-sized) rock samples for laboratory analysis.
- Perform microscopic investigation, determine the age of the rocks, and acquire geochemical data using the collected samples.
- Use the data to produce an updated geological map, graduate thesis paper and scientific papers.

Rationale: The rationale of this project can be described in the following four points:

- 1) The current geological map is outdated and lacks detail; this warrants an updated survey.
- 2) It has been assumed since the 1950's that the rocks in this area are Archean in age (>2.5 billion years old). Recent dating of rocks from nearby areas has revealed that the age of these rocks is sometimes ~500 million years younger than previously thought. This has very important implications on our current understanding of the geological evolution of this region and we would like to complete field work to redefine our understanding of the area.
- 3) A very significant fault/fracture system called the 'Snowbird Tectonic Zone' (STZ) runs through this area. It is suspected that the STZ is linked to very significant mineral deposits in the Kivalliq (i.e., the Meadowbank and Meliadine deposits). The exact location of the STZ in the southwestern region of the Kivalliq is poorly defined and warrants an updated survey.
- 4) A package of rocks in Manitoba and Saskatchewan, just south of the Nunavut border host a suite of critical minerals. This package of rocks is a part of the Athabasca basin. We suspect that this same package of rocks continues northward into Nunavut, and we would like to assess their potential to host critical minerals.

Progress to Date: Since 2023, the Geological Survey of Canada's engagement team and scientists have been working towards an engagement plan to include locals from Chesterfield Inlet, Baker Lake and Rankin Inlet into the project. To date, the Geological Survey of Canada have had representatives (scientists and engagement officer) meet with the communities of Baker Lake, Chesterfield Inlet and Rankin Inlet to discuss our proposed project and find out any possible concerns. In terms of capacity building, we hope that 1 or 2 local people from Chesterfield Inlet or Baker Lake will be joining the field crew in the field. During a meeting with the Hunters & Trappers Organization (HTO) of Baker Lake, we offered the opportunity for

employment as a wildlife monitor and/or boat operator. The HTO was enthusiastic about our intentions to include locals in the project. We will be in touch with the HTO again to set up contracts if there are candidates available for the employment opportunities. In addition, we are working on submitting permits, to date the application for the Nunavut Planning Commission has been submitted (ID 150268), as well as applications with the Nunavut Water Board and the Kivalliq Inuit Association.

Methodology: A team of six geologists and support staff will focus their efforts on bedrock mapping, and aspects of stratigraphy, structural geology, and age dating of the rocks. A campsite will be set up on the shore near Uvauk Bay. Transportation to and from the campsite at the start and end of the project will be by a local boat from Baker Lake or Chesterfield Inlet. The campsite will have up to seven tents for kitchen, bathroom and sleeping use. Water for the camp will be collected from a nearby stream/river and a small generator will be used for power. Field methods will include daily hiking excursions and possibly using boat use. Geologists will hike across the land (up to 10 km daily) and collect field observations in the form of notes, photographs, and rock samples by hammer. The collected samples will be analysed at the Geological Survey of Canada in Ottawa or at Canadian universities.

Data Management: The data will be stored in the Geological Survey and Canada's database. Field notes and photographs will be catalogued and archived. Any archeological findings will be photographed and coordinates noted and sent to the Inuit Heritage Trust for their management.

Research Outputs:

- 1) An updated geological map
- 2) A graduate thesis
- 3) Two or three scientific journal publications
- 4) An Open File report from the Geological Survey of Canada