



Nunavut Impact Review Board
Long Term Water Project – Raw Water Supply and Storage
Geotechnical Investigation Proposal



NUNAVUT IMPACT REVIEW BOARD
LONG TERM WATER PROGRAM – RAW WATER SUPPLY AND STORAGE
GEOTECHNICAL INVESTIGATION PROPOSAL

Summary

Background

The City of Iqaluit is facing critical challenges with its drinking water supply due to its growing population and the impact of adverse climate changes. To address this pressing issue, the City and their consultants will progress designs for upgrades to its water supply and distribution infrastructure systems. The upgrades are anticipated to include pumping and conveying water from Qikiqtaalik Lake (also known as Unnamed Lake) through conveyance pipes to a newly constructed earth berm storage reservoir located adjacent to Lake Geraldine. The source water upgrades will primarily comprise three key aspects: raw water extraction, raw water conveyance, and raw water storage. To advance the engineering design of these upgrades, and ahead of future permitting phases, it is imperative that thorough geotechnical field investigations are completed. These investigations aim to assess existing site features and underground conditions. For timeframe of these investigations, the City anticipate to commence geotechnical field investigations in 2023, with completion anticipated during the summer of 2024.

Purpose

The purpose of this project proposal is to advance the project geotechnical investigations. The geotechnical investigation will study the surface and subsurface conditions of the future pump station, the conveyance pipe, and the reservoir to determine if the sites are adequate to proceed with design, permitting and construction activities.

Methodology

A research geotechnical drilling program will be implemented to coordinate the field investigation and will consist of an estimated total of 24 boreholes (12 boreholes at ~5m depth and 12 boreholes at ~10m depth). For the raw water conveyance pipe, there are two potential alignment options identified in prior studies. Both alignments are roughly the same distance and therefore will require approximately 12 boreholes in total for a geotechnical study. Six (6) of those boreholes at 5-meter depth and six (6) of those at 10-meter depth along the line. Some of those mentioned 12 boreholes will also include the pump station structure for the geotechnical study. The new reservoir will require the other 12 boreholes, six (6) at 5m depths and six (6) at 10m depths. The exact locations will be based on project consultants' recommendations and on-site conditions/surveys. However, the tentative Geotechnical investigation boreholes would be located in three approximate areas:

1. At the proposed pump station site adjacent to Unnamed Lake on the south side in an investigation area approximately 10 m x 10 m and centered at Latitude 63.779769, Longitude -68.450412
2. At the proposed reservoir site adjacent to Lake Geraldine on the East side in an investigation area approximately 750m x 350m and centered at Latitude 63.761552& Longitude -68.492085
3. Along the proposed conveyance pipe routes (2) which extend approximately 5 km between the pump station and reservoir with each route comprising an investigation width of 10m

Environmental Considerations

The project proponent will prepare essential management plans, including a spill contingency plan, health and safety plan, refueling procedures, and erosion and sediment control plan for reinstating any impacts resulting from localized boreholes upon the completion of the research activity. Particular attention will be given to avoiding disruption to areas housing fragile vegetation or wildlife. The use of non-toxic drilling fluids will be used to prevent any contamination of water bodies in the vicinity.

Material & Labour Use

The geotechnical investigations are expected to use the follow resources to complete the investigation:

- Borehole Drilling Machine
- Flatbed Truck
- Diesel
- Petrol
- Support Vehicle
- Anti-Freeze
- Approximately a team of 5 workers



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~~Date: July 20, 2023~~

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