Project Proposal to amend the Water Licence # 3BM-RUT 1520 of the Utilidor System of the Hamlet of Resolute Bay in order to accommodate the construction of the new pump station at Char Lake.

The Hamlet of Resolute Bay is located on the South cost of Cornwallis Island on the Perry Channel and located at $74^0$43'01"N and $94^0$58'10"W. The population of the community varies from 250 to 800 due to presence of visitors and Canadian Arm forces. The Community is serviced by an Utilidor which is maintained and operated by GN-CGS as the licensee. The Utilidor system was built in the 1970s and the liner systems were replaced completely in 2016.

The water system constitutes Char Lake, the pump house, the water treatment plant and associated delivery mediums. The different components of the entire water supply system have been planned to be upgraded in different phases as the Utilidor system was upgraded in 2016. The Water pump house at Char Lake is scheduled under the Phase 2 to be upgraded in 2018. The Design of this facility is complete.

The existing pump house is accounted average extraction volume daily 355,772 litres. The current water Licence #3BM-RUT TYPE B was issued on March 30, 2015 and will be expired on March 29, 2018 with the water quantity extraction permit of 126,020 m^3 annually.

The pump house is over 35 yrs. old and nearing the end of its useful life cycle. This station has multiple issues at its old age. Besides the structural non- functioning, there was a fuel spill next to the pump station in around 1988-89. Therefore the new pump station is planned to be built about 60m east to the existing pump house. At the same time, areas that have been contaminated by hydrocarbons shall be reclaimed to meet objectives as outlined in the GN's environmental guidelines for site remediation, January 2009.

A ductile iron gravity intake line extends from Char Lake to wet wells in the Char Lake existing Pump house which tempers water using a hot water injection into the wet wells. Diesel fired boilers are used to heat the injection water. The tempered water is pumped through the 150mm heat traced and insulated HDPE water supply main about 1.88km to the water storage reservoir at the Signal Hill Water treatment plant. The Char Lake pump house pumps are controlled from a level controller located at the Water Storage Reservoir.

The new Pump House at Char Lake is proposed to be built 60m to the east from the existing facility. A design flow rate of 12L/s has been selected for the new the pump house which will incorporate inclined shaft intakes. The 1.6L/s flow is recommended to be maintained in the water main connecting the Char Lake pump house to the Signal Hill Water Treatment Plant between storage tank refill cycles as a freeze prevention measure. A total of 3 inclined shaft intakes, each equipped with a pump rated at 6L/s, are recommended in the design.

The design recommended size of 1.88km transmission line linking the new pump station at Char Lake to the Signal Hill Water Treatment Plant is 150mm with the 75mm factory installed insulation and a heat trace along the transmission line.

Three boilers, each rated a 450MBH, are recommended for heating of both potable water and the pump house building. In addition, a fuel fire unit heater should be provided. A 600/347 volt electrical service is recommended along with a new standby diesel generator in order to facilitate the electrical supply to the heat trace cables on the transmission watermain.

A conventional building of 170m^2 is recommended with a slab on grade, steel framing and insulated metal panels.

The existing Pump House will be decommissioned once the new facility will be built and fully commissioned.

The petroleum impacted soil of the existing Pump station area is recommended to be remediated following the commissioning of the new facility.