

December 19, 2022

Nunavut Water Board P.O. Box 119 Gjoa Haven, NU X0B 1L0

Dear Richard,

The Hamlet of Naujaat is requesting to include the upgrade and expansion of the existing wastewater treatment facility and the amendment of the effluent limits at the final effluent discharge point REP-6 in the amendment and renewal of the 3BM-NAU2026 water license. Screening for these items was completed by Nunavut Impact Review Board on September 28, 2022.

The expansion of the existing sewage treatment facility will effectively service the growing population in Naujaat until the design horizon of 2043. A Pre-Design Report was completed in 2022. The treatment facility will be designed with a new upstream primary lagoon cell that is impermeable. The existing downstream natural depression that is acting as the current lagoon will become a secondary treatment cell, and the existing downstream wetland-treatment-area (WTA) will remain in use. Seasonal effluent pump out to the secondary cell and WTA is to occur late in the summer season to allow spring freshet to pass and to allow the wetland to recharge to promote its ability to support effluent biodegradation.

The requested amendment to the effluent limits within the WTA is based on the most comprehensive research completed to date on lagoon-wetland systems in Nunavut and considers the significant change to the hydrologic regime that will be influenced by the seasonal pump out of the future impermeable lagoon that will replace the passive exfiltration and dilution that occurs now. The treatment goals for the lagoon-wetland effluent criteria, at the end of the treatment process, were established as 100, 120, and 1.25 mg/L for carbonaceous biochemical oxygen demand, total suspended solids, and un-ionized ammonia as nitrogen, respectively, to protect the final receiving environment. These effluent criteria are based on Nunavut specific research that CGS completed in partnership with Dalhousie University from 2010-2016, along with the additional field study completed by Dalhouise of the Naujaat wetlands in 2017. These effluent quality limits are technology based, along with

confirming that effluent of this quality would not have a negative impact on the receiving environment.

Given an estimated population of 1,225 residents in 2021 by Statistics Canada, the design population to be serviced by the expanded lagoon was projected to be 2,175 people in 2043. This population will require an active storage volume 121,469 m3 for 12 months of storage.

The lagoon discharge point will be by controlled manual pump out into the secondary lagoon that will then exfiltrate into the WTA which will remain at the same location. The decant system will be designed with a flowrate below 2500 m3/day to ensure effluent has sufficient residency time in the WTA. An updated Operations and Maintenance Plan will be submitted to NWB once the new lagoon is commissioned.

This submission includes the following documents:

- The letter of authorization from the Hamlet of Naujaat
- The renewal application
- The application summary in Inuktitut and English
- The NPC Conformity Determination letter
- NIRB Screening Decision cover letter and report
- The 2022 compliance plan
- The updated Quality Assurance and Quality Control Plan, Environmental Emergency Spill Contingency Plan, Water Supply OM Plan, Sewage Disposal Facility OM Plan, and Solid Waste Facility OM Plan
- Consideration of Effluent Amendment Request
- Pre-Design Report

Regards,

Kayla Clouter, CET

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