August 5, 2020

Bhabesh Roy, PEng
Government of Nunavut
Pond Inlet, NU
BY EMAIL

Re: 00220382 800 Remediation and Leak Testing Procedures for new South Lagoon in Hall Beach

Dear Bhabesh:

Nunavut Excavating has advised EXP Services Inc. (EXP) of the following course of action for ascertaining the source of leakage from the new South Sewage Lagoon in Hall Beach and advancing remedial work to stop the leakage.

Justification

During July 2018 it was reported that bubbles were observed in the liquid retained in the new south sewage lagoon, and that the cell was completely drained by the end of July. In response to this event EXP mobilized to the site on August, 2018 to conduct an assessment of the sewage lagoon cell. The assessment was conducted with the assistance of the contractor, Nunavut Excavating, who operated available equipment to assist in the work. The assessment was conducted to identify possible causes and remediation measures to restore service of the sewage lagoon cell. As the liner system is overlain by about 0.45m minimum of cover material and sand, the assessment was limited to areas of concern interpreted from site observations and locations adjacent to those to identify conditions of the liner. The work conducted as part of the assessment was limited to 4 areas and remedial work on the discharge locations. The lagoon was put back into service in 2019 and in July 2020, it was observed that there was an uncontrolled discharge of the new south sewage lagoon which drained the sewage within a short period of time. The Hamlet of Hall Beach filed a spill report upon the observation of the spill. This event identified the need for further investigations to identify possible causes and execute remedial measures to stop the uncontrolled discharge.

Procedures

Nunavut Excavation has advised EXP of the following strategy to identify and remediate the source of the leakage in the south sewage lagoon, and EXP has reviewed the strategy.

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1. Execute an organized leak detection exercise of the sewage lagoon base by exposing the liner in a segment by segment manner;
2. Advance the exposure of the liner based upon the observations of the liner condition, and record of the excavations and condition for future reference;
3. Complete remedial repairs to those segments of the liner which are observed and judged to be contributing to the leakage from the lagoon – the potential observations may be seams that may be wrinkled, which affects joint integrity, or seams that have other damage, and damage to the GCL in areas away from the seams.
4. Introduce water from the North Sewage Lagoon into the remediated area;
5. Observe the retention of water in the remediated area to ascertain if a leak in the GCL is occurring, and observe if any discharge appears on the exterior of the cell – no testing is planned before or after the discharge because the discharge quality will be the same as the discharge quality of the north cell, which has already been tested.
6. Execute additional remedial work in the lagoon by exposing the liner in a segment by segment matter;
7. Reintroduce water from the North Sewage Lagoon to test the additional remedial work.

An alternate source of water may be the seasonal tundra ponds adjacent to the lagoon. This source of water would provide a "cleaner" water for the program to identify and remediate the source of the leakage in the south sewage lagoon. The estimated volume of this alternate source of water is 450 cubic metres.

Spill Mitigation

The quality of the discharge of the treated waste water is expected by be of the same quality as the licensed effluent discharge from the north sewage lagoon. The discharge of treated wastewater from the south sewage lagoon cell, which will have originated from the north sewage lagoon, as part of the program to identify and remediate the source of the leakage in the south sewage lagoon, will be considered a spill and the Municipality will be requested to file a spill report if leakage occurs during the testing of the remediation work.

Erosion Mitigation

Erosion mitigation will be applied by managing the velocity of the pumping discharge, and protecting the erodible surfaces of the pump discharge areas.

Schedule to Complete Work

The work began on July 29 with the exposure of the liner to make visual assessments of its condition. More specifically, the excavations exposed the liner seams and assessed wrinkles and other issues that may be causing the leaks in the GCL. Remedial repairs to these potential areas of leakage will be completed, and testing of liner by filling the lagoon may begin by August 20. Completion of the remedial may be expected by August 28.

Should you have any questions or require additional information, please do not hesitate to contact the undersigned at 780 984 9085 or by email ken.johnson@exp.com .

Sincerely,
EXP Services Inc.

Ken Johnson, RPP, PEng
Planner and Engineer
Arctic