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RE: NWB3HAL0308 – Submission of January 2005 Trow Report – Sewage Lagoon Decommissioning, Hall Beach

On behalf of Environment Canada (EC), I have reviewed the information submitted with the above-mentioned application. The following specialist advice has been provided pursuant to Environment Canada's mandated responsibilities for the enforcement of the *Canadian Environmental Protection Act*, Section 36(3) of the *Fisheries Act,* the *Migratory Birds Convention Act*, and the *Species at Risk Act*.

Trow Associates Inc. (Trow) was contracted by the Government of Nunavut's Department of Community and Government Services to undertake an engineering study to determine how to remediate Hall Beach's decommissioned sewage lagoon cell. Their results indicate that the underlying soil of the abandoned lagoon has not been adversely impacted by accumulated sewage sludge and that the potential for future impact beyond the lagoon cell is minimal. Within Trow's sewage lagoon decommissioning report, measures to remediate this former component of the community's sewage treatment system are provided.

The Hamlet of Hall Beach is located on the eastern shore of Melville Peninsula and the western shore of Foxe Basin, having coordinates of 68˚ 46' N, 81˚ 12' W. The 2001 population census reported that 609 people lived within this community, a growth of 12.2% from the 1996 census results which stated that it had a population of 543 people. Hall Beach had an interconnected exfiltration sewage treatment system with two lagoon cells, located approximately 1.0 km from the community. The sewage treatment system was designed to allow for the passage of sewage effluent through semi-permeable granular berms in summer seasons. The discharge is then intercepted by a series of ditches and directed through a wetland treatment area prior to entering the ocean. The smaller of the two cells (constructed in 1998) was incorporated into the new lagoon while the larger cell has been abandoned.

Trow's engineering study addressed the soil and ground water properties of the abandoned sewage lagoon cell. Twelve soil samples and three ground water samples were collected in June of 2004 and compared to the Canadian Council of Ministers of the Environment (CCME) standards. These samples were sent to Paracel Laboratories of Ottawa for analysis for metals, petroleum hydrocarbons, and volatile organic compounds. As previously stated, the test results indicate that the underlying soil of the abandoned lagoon has not been adversely impacted by accumulated sewage sludge and the potential for future adverse impacts beyond the lagoon is anticipated to be minimal.

Remediation efforts will strive to cover a variety of purposes, namely, aesthetic improvement, reduction of infiltration, site drainage, and sludge stabilization through freezing. The old sewage lagoon cell will be backfilled with graded granular material to a minimum depth of 1.5 m. It is anticipated that 6,600 m^3 of shattered limestone will be gathered from non-glacial deposits of gravel and boulders at a local source nearby the ocean's shoreline.

Environment Canada recommends that the following conditions be applied throughout all stages of the project:

GENERAL

- The proponent shall not deposit, nor permit the deposit of any fuel, chemicals, wastes, or sediment into any water body. According to the *Fisheries Act*, Section 36(3), the deposition of deleterious substances of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water, is prohibited.
- Environment Canada requests clarification regarding whether any standing water remains in the larger southern lagoon cell. If standing water is present in the cell, EC recommends that this water be pumped into the northern cell that has been incorporated into the new lagoon system. This will allow this water to receive some level of treatment prior to its release into the environment.
- Environment Canada notes that the Trow Report indicates that there are additional lagoon sludge analytical results that were previously obtained by the Department of Community and Government Services. Environment Canada recommends that these results be submitted for comparison to those obtained by Trow Associates Inc.
- Environment Canada requests further information regarding the proposed end use of this site. It is noted that the CCME / Canada Wide Standards (CWS) land use category adopted for this project is "industrial". Given that the lagoon is only located 1 km from the Hamlet of Hall Beach, EC is concerned that this location may be subject to non-industrial land uses in the future. Environment Canada recommends that the site be well marked with signage indicating the presence of a decommissioned sewage lagoon in the area. Environment Canada also recommends that the Hamlet of Hall Beach consider zoning this area "industrial" to prevent future residential development in the area.

- Given that the proponent has noted that deposits of gravel are located along the shoreline in Hall Beach, the proponent shall not deposit, nor permit the deposit of sediment into any water body. It is recommended that an undisturbed buffer zone of at least 100 metres be maintained between any proposed quarry operations and the normal high water mark of any water body.
- The Decommissioning Plan currently proposes to alter the surface drainage patterns so that water will drain eastward toward the creek. This will involve "partially" removing the east and south berms for cover material. Further detail is required regarding how much of these berms will be removed. Given the elevated moisture content present in sludges, completely removing the containment berms will likely cause the sludge material to slump and spread outward. Without knowing the depth of the sludge material present in the southern lagoon cell, it is difficult to estimate how much of the south and east berm can be removed. Environment Canada recommends that the proponent ensure that the sludges remain contained within the area and do not escape into the surrounding areas.
- Section 4.2 of the Report indicates that "no long term monitoring is required". Environment Canada recommends that the monitoring well installed in borehole BH#4 be monitored for total metals, total petroleum hydrocarbons and volatile organic compounds as part of the Hamlet's SNP monitoring under their water license. Given that melted permafrost was the only water sample taken, and "this is not typically considered representative [of a] groundwater sample" (page 6), this will ensure that groundwater is not impacted and that the lagoon does not begin to leach contaminants in the future.
- The Report does not provide information regarding the specifications for the type of granular material that will be used to cover the lagoon cell. Environment Canada recommends that the final cap consist of material that will not easily erode and contribute to sedimentation of the wetland located north of the cell.
- Environment Canada recommends that the proponent consider climate change when designing the cap for the lagoon cell. The proponent should ensure that the cap is of sufficient thickness that permafrost will not be affected in the event of a climate change scenario. The work should be stamped by a professional engineer certified to work in Nunavut.

FUEL STORAGE / SPILL CONTINGENCY / HAZARDOUS MATERIALS

- Drip pans, or other similar preventative measures, shall be used when refueling equipment on site.
- ALL SPILLS are to be documented and reported to the 24 Hour Spill Line at (867) 920-8130.
- Environment Canada recommends the use of secondary containment, such as self-supporting insta-berms, when storing barreled fuel on location rather than relying on natural depressions.

If there are any changes in the proposed project, EC should be notified, as further review may be necessary. Please do not hesitate to contact me if you have any questions or comments with regards to the foregoing at (867) 975-4631 or by email via david.abernethy@ec.gc.ca.

Regards,

David W. Abernethy
Environmental Assessment Technician