

Technical report of the Wastewater Treatment facility in Arctic Bay

Arctic Bay, also called Ikapiarjuk (the pocket), is located 73°02'N and 83°05'W on the Borden Peninsula of Baffin Island of Nunavut. It is a mid size community of with a population of approximately 855.

The community generates an estimated 33,600 cubic metres of sewage annually which is treated in a sewage lagoon located 2.5 km to the east of the community. Effluent from the lagoon flows southwards for 400m towards Arctic Bay. This area is dominated by sedges, cotton grasses and willows providing additional natural wetlands treatment. The lagoon is located directly adjacent to several ephemeral water courses that provide seasonal drainage to the surrounding topography.

The lagoon was constructed in 1976 and is a seepage cell design with permeable dykes. The lagoon is at the end of its useful life as sections of the dykes have become plugged while other areas have experienced piping (uncontrolled leaking). This problem was partially addressed but not totally solved through the construction of an ice pack area and detention berms in the wetlands area.

During the winter months, a sewage ice pack forms, with subsequent sewage inputs freezing upon contact. As would be expected, there are no discharges from the sewage ice pack to the seepage area during the winter months. This approach has failed to meet the requirements of the conditions of the Nunavut Water Board Guidelines. Currently the Hamlet of Arctic Bay is under non compliance. The existing Water License was expired on October 31, 2007. The renewal application was made and it is under review process.

Trow Associates Inc. have been retained to identify a new location, conduct studies including geotechnical investigation, geothermal modeling, wetland modeling and topographical surveys and based on the information from these studies design a new wastewater treatment facility. The concept is to decommission the existing Lagoon once the new lagoon is commissioned.

The proposed waste water treatment facility will be located about 1.00 km northeast of the existing Lagoon on the top of the adjacent hill. It is a single cell lagoon followed by natural wetlands. The expected effluent quality is BOD₅ 97 mg/L and TSS 116 mg/L at the end of the lagoon and BOD₅ 18 mg/L and TSS 22 mg/L at the end of the wetlands. It has been designed to meet the projected needs of the Hamlet for 20 years and satisfy the requirements of the Nunavut Water Board. The facility has been well designed to face the challenges of the future CCME guidelines.