

Technical Report of the Environmental Facilities of the Hamlet of Arctic Bay
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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. This is a mid-size Community for the population of about 766 in 2013. The annual consumption of water in 2013 was 27,340 cubic meters; whereas the permit was given to the community was 45,000 cubic meters annually under the water Licence # **3BM-ARC 0810**. The Current water licence regulates three Environmental Facilities: Water Supply, Sewage Lagoon and landfill site.

Water Supply: The Marcil Lake is the main potable water source in the Community. Water Truck Fill Station (WTFS) is located there about 500km away from the new Airport and about 8km from the Community. Truck delivery is the only water distribution system to the Community. Water Truck Fill Station is hooked up with the power line and the generator is also kept standby at the site for emergency. Water quality is monitored, managed and maintained satisfying the drinking water regulations. Heat trace of the intake pipe has been upgraded. Flow meter is working to record the extraction volume of water from the Lake. The Hamlet is using the existing O&M manual to operate this facility.

Old Sewage Lagoon: There was a Sewage Lagoon which was located 2.5km west of the Community. This facility was structurally unstable and had also a capacity issue. This Sewage Lagoon used to discharge effluent into wetland which sloped southwards for 400m towards Arctic Bay. More specifically, the area of this old Lagoon was dominated by sedges, cotton grasses and willows. This lagoon was located directly adjacent to several ephemeral water courses that provided seasonal drainage to the surrounding topography. This facility was decommissioned in 2013 after the new facility was built and commissioned in 2012.

New Sewage Lagoon: The New Sewage lagoon site was identified on the top of the Hill about 500m away from the old lagoon site. Trow Associates Inc. which is now exp Services Inc. was the consultant for this project. They conducted studies on geotechnical investigation, geothermal modeling, hydrology, wetland modeling and topographical surveys. Using the information, they finally designed the new single cell Sewage Lagoon for the capacity of 59,900 cubic meters for 20 yrs. life time. This new Sewage Lagoon has a large wetland treatment area where the sewage effluent is further treated and polished prior to runoff into Victor Bay which is 700m away from the new lagoon. The new facility is connected with an access road of about 1km long from the existing lagoon. The construction of the access road was started in 2009 and completed in 2010. The new Sewage Lagoon was constructed in 2010/11 and commissioned in 2012. The new facility was not operated in 2011 because the berms were allowed to be freeze during winter season. Hamlet has been using the new Sewage Lagoon following the O&M manual prepared by exp Services Inc.

Land fill site: The community domestic and metal wastes sites are located next to the existing Sewage Lagoon. This is a non engineered facility. Hamlet is dealing with the Community Government Services (CGS) to address this non compliance issue in order to bring the community under compliance. The waste management project is on hold. The design of the new waste management site will be prepared following CGS's new guidelines.

Hamlet is doing extended Monitoring program for sampling of water, wastewater and leachate and testing in an accredited lab in Ottawa to satisfy the requirements of the water licence.