

Technical Summary of the Environmental Projects under the Water License # 3BM-PAN 0810; Hamlet of Pangnirtung

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The Hamlet of Pangnirtung ("the place of Bull Caribou") is located at 62°10'N latitude and 92°36' longitude, on the eastern shore of Baffin Island. This is the second biggest Community within Qikiqtani Region of Nunavut. This community is about 50km south of the Arctic Circle and situated on the northern side of Cumberland Sound. Pangnirtung's landscape is stunning. Snow-capped mountains that rise out of Pangnirtung fiord surround the town. The active layer of the community ranges from 0.50m to 2.00 m.

The annual water consumption of the Community was recorded for 48,440 cubic meters in 2010 considering the population of 1500. The wastewater of the community is being treated by a mechanical plant whereas the municipal solid waste is treated by open land fill technology. Fish solid wastes received from a privately owned fish processing plant are dumped in the open land fill site. Biosolids (sludge) are bagged inside the WWTP and dumped as well in the open land fill site.

The Hamlet Water License # 3BM-PAN 0810 includes three main facilities:

- Wastewater Treatment by a Mechanical Plant(WWTP)
- Water Supply System
- Waste Management by open Land fill technology

WWTP: This is the second mechanical plant of Baffin Region which was commissioned in 2003. The plant was originally designed to operate on a rotating biological contactor (RBC) but due to design flaws the main source of treatment had to be changed to activated sludge in 2005.

The retro-fit was quite simple and the Pangnirtung wastewater treatment plant now works off some basic wastewater principles. In 2007, a comprehensive performance evaluation study was conducted by Dillon Consulting Ltd and they recommended dealing with the Health and Safety of the operators and up gradation of the electrical system as a priority. In 2010, a control room was built for the operators. The electrical devices and control system have been upgraded. The heating and ventilation of the plant has also been modified to manage the humidity inherent in the treatment process. The process mechanism of the plant remains unchanged. Process optimization is the future plan but this is not scheduled yet. Currently the plant is treating average nearly 133 cubic meters of wastewater per day.

Solid Waste Management: The Community has an open Land fill site which accommodates domestic wastes, construction wastes, biosolids (Sludge), fish wastes and also metallic wastes. This site is located close to the Wastewater Treatment Plant and under capacity. Dillon Consulting Ltd, an engineering consulting firm, conducted a feasibility study and identified a new location for waste management. Later on another Engineering consulting firm named TROW (exp) has been retained to design the facility to accommodate all types of wastes in their individual cells. This project was put on hold by GN-CGS capital planning. No work was carried out since the contract was awarded to Tow in 2010. In early August, 2011, Trow has been advised to mobilize to the site and start working on this project but not necessarily

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using the open land fill management concept. Trow has been asked to design a mechanical waste management facility which is cost effective, energy efficient and easy to operate. Trow will also design for decommissioning of the existing waste management site (open land fill) at the same time. Once the new facility is in operation, the existing land fill site will be decommissioned. The design is scheduled to be completed in 2011 and the new facility is expected to be built and commissioned in 2012-13. The decommissioning of the existing land fill facility is scheduled sometime in 2013-14.

Water Supply System: The main water source of this community is Duval River. A Water storage Reservoir was constructed in 2004 and it is located next to this River. The Reservoir is filled up on annual basis extracting water by pumping from this River in every summer. This is a 30 mil hypalon lined containment structure with a working capacity of 12,000m³ in summer and only 71,000m³ in winter considering 1.8m ice cover. The annual consumption in 2010 of the community was only 48.440m³ and considering population 1500, per capita consumption per day was 88.48L/p/d whereas the projected consumption for twenty years horizon in 2024 is 129L/p/d. The Reservoir itself has sufficient storage capacity to the serve the community for thirteen (13) more years.

A truck fill station is located on the Eastern end of the Reservoir and is operated by electricity. The station is equipped with a standby Generator in case of emergency. This station needs to be upgarded. An engineering consulting firm ARTIS Solutions Incorporated has been retained to prepare design to optimize this facility. The Preliminary design has been completed for CGS review; however, it has been proposed that the best value for the GN would be achieved by replacement of the truck fill station as opposed to repair.

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