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NUNAVUT WATER BOARD  
NUNAVUT IMALIRIYIN KATIMAYIT  
OFFICE DES EAUX DU NUNAVUT

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File No.: 3AM-GRA1015/TR/C8

September 8, 2011

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**Subject: Licence No. 3AM-GRA1015 – Hamlet of Rankin Inlet, Kivalliq Region, Nunavut; Submission of “Design Pipeline System to Augment Natural Replenishment of Nipissar Lake, Rankin Inlet, Nunavut, Canada”.**

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Mr. Wall,

The Nunavut Water Board (“NWB” or “Board”) received on April 27, 2011, the “Design Pipeline System to Augment Natural Replenishment of Nipissar Lake, Rankin Inlet, Nunavut, Canada” (“Report”) dated December 15, 2010 and prepared by FSC Architects & Engineers (FSC) on behalf of the Government of Nunavut – Department of Community and Government Services (GN-CGS), to fulfill the requirement of Part C, Item 8(d) of licence 3AM-GRA1015, which states that:

The Licensee shall submit to the Board for review by December 31, 2010, a Sustainability Assessment Report for Nipissar Lake. The Report shall include and address the following:

- a. Findings of the water use audit and leak detection survey;
- b. Detailed assessment of current and projected water volumes to be withdrawn from Nipissar Lake against total annual recharge (i.e. Water Balance);
- c. Evaluation of impacts on Nipissar Lake due to current water taking and future needs
- d. Recommendations, including remedial engineering of the facilities and alternative water sources as required to address impacts on Nipissar Lake.

The submission was distributed for comments on July 8, 2011. Comments were received from Aboriginal Affairs and Northern Development Canada (AANDC) and Environment Canada (EC) on July 29, 2011 and July 27, 2011, respectively.

AANDC recommended that sediment and erosion control measures be implemented prior to and maintained during the construction and operation of the overland pipeline, and appropriate corrective measures be undertaken to mitigate impacts on surface drainage resulting from the licensee’s operations. It was also stated that the Licensee should update the Operation and Maintenance, and Spill Contingency Plans upon the completion and commissioning of the overland pipeline.

EC stated that at this time, there are no concerns regarding this document.

Although the comments received generally accepted the proposed remedial operations, the Board would like to clarify that any water use from alternative water sources, whether direct or to supplement the Nipissar Lake watershed, yet to be defined, will require a submission of an application for amendment to Licence 3AM-GRA1015, detailed review and public consultation and approval of the Board.

Following the review of the Report, the NWB has determined that there are some issues that need to be clarified prior to the selection of a suitable water source intended to augment the natural replenishment of Nipissar Lake, which will be suitable to satisfy the community of Rankin Inlet's water demand for a minimum period of 20 years.

Section 3.1, referring to the Design Calculations in the Report, indicates that “*currently Rankin Inlet is consuming water at approximately 469 LCPD, with a population of 2499 in 2009. Utilizing a 2030 population growth rate of 3% gives a population of 4649*”. If the water demand for the “*year 2030 is to be 344 LCPD*”, as indicated in the report, “*this results in a consumption level in Year 2030 in the amount of 583,713 m<sup>3</sup>: (4649 x 344 x 365 / 1000). From the FSC 2009 report, the average Water resupply to Nipissar Lake is 311,789 m<sup>3</sup>/year*”. Based on the aforementioned calculation, the “*required Water to be made up into Nipissar Lake from Lower Landing Lake = 583,713 – 311,789 = 271,924 m<sup>3</sup>/year*”. The highest pumping requirement in 2030 is indicated to be **484,029 m<sup>3</sup>/year**, if the water consumption is 469 LCPD.

The amount of water allowed for under the current licence, 3AM-GRA1015, is 850,000 m<sup>3</sup>/year and the Hamlet's projected population in 2015 was estimated by GN to be 2676, which gives 870 LCPD. The Application Executive Summary for the licence renewal submitted to the Board on March 19, 2009 indicated that “*Hamlet is using more water than estimated in the equations which may be part to the extensive Utilidor system in the Hamlet that requires water flowing through the pipes or that the Hamlet has water uses that are different to that of a typical community*”. Using the data summary sheet for two days in July, 2008, the daily use rate was estimated from the two monthly averages, and “*in 20 years the annual water use was estimated to be 900,000 m<sup>3</sup>*” as indicated in the Application Executive Summary. If these trends continue, that would conclude that the required water to be made up into Nipissar Lake could be considerably more and equal to the **588,211 m<sup>3</sup>/year**: (900,000 – 311,789) m<sup>3</sup>/year.

There was no information provided with respect to the impacts that the withdrawal of water at these rates from Lower Landing Lake will likely have on the source in the long term. A Water Balance for the Lower Landing Lake would help to address this issue and provide the confidence needed in assessing the impacts to the source.

The NWB has determined that the following specifics of Part C, Item 8 are to be provided for Board review, and completed prior to the determination and application for an alternative water source, to address possible shortfalls in water quantity at the Nipissar Lake source.

- a. *Findings of the water use audit and leak detection survey;*
- b. *Detailed assessment of current and projected water volumes to be withdrawn from Nipissar Lake against total annual recharge (i.e. Water Balance);*
- c. *Evaluation of impacts on Nipissar Lake due to current water taking and future needs.*

Addressing these requirements will help to more accurately estimate the Hamlet's annual water use in the future and provide details on possible shortfall of water at Nipissar Lake.

It was also noted that Appendix B – Issued for Review Design Drawings was not included with the Report. The NWB requests that the licensee provide the Board copies of all relevant design drawings referenced within the report.

Should you have any questions, please feel free to contact the undersigned at (867) 360-6338 Ext. 30 or [k.kharatyan@nunavutwaterboard.org](mailto:k.kharatyan@nunavutwaterboard.org), at your earliest convenience.

Yours truly,

*Original signed by:*

Karén Kharatyan  
Technical Advisor

cc: Distribution List – Kivalliq