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Mr. Bhabesh Roy, M.A.Sc., P.Eng.
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Community & Government Services
Baffin Region, Government of Nunavut
P.O. Box 379
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Via Facsimile:
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Water Licence 3BM-KIM0911
Hamlet of Kimmirut

Dear Mr. Roy:

As per your request, we have reviewed the Hamlet of Kimmirut's Water Licence, issued on January 19th, 2009 and offer the following comments.

1) **III – ISSUES – Page 9, Paragraph 3:** The water licence requires as a condition of Part E Item 1 that the licensee is to implement the recommendations put forth in the *Design Brief Rehabilitation Expansion to the Existing Sewage Lagoon for the Hamlet of Kimmirut*, dated 2008, prepared by Trow and the following design provided in the drawings by Trow under project number OTCD00018881A.

2) **III – ISSUES – Page 9, Paragraph 5:** This paragraph states

> *"EC, in its comments dated January 10, 2007 recommended that the parameter limits from the previous licence, which in EC's opinion are consistent with the 1992 Guidelines should be carried forward to the renewal, assuming that the final discharge point is at the lagoon outlet and the treatment does not include a wetland. This recommendation was provided prior to the Applicant's submission of the amendment application document including the document entitled Design Brief Rehabilitation and Expansion of the Existing Sewage Lagoon for the Hamlet of Kimmirut dated January 2008 and prepared by Trow which included the applicant's proposal to meet the previous licence parameter limits at the end of the Wetland Area. No further comments were receive form EC regarding the applicant's updated proposal, however the Board continues to agree with EC's comments and is therefore carrying forward effluent quality criteria from the previous licence to Part D Item 2 of he Licence renewal and amendment to be met at the lagoon outlet."*

It should be noted that the Design Brief and the intent of the project was the incorporation of the wetlands treatment as the main treatment source for sewage treatment in Kimmirut. The proposed sewage lagoon systems would provide containment and pre-treatment to the sewage prior to release to the wetlands.

It should also be noted that Guidelines for Discharge of Domestic Wastewater In Nunavut prepared for the Nunavut Water Board in 2000, in section 6.4 states:

> "The *Water Board encourages the use of land treatment systems. When used alone or in combined with other processes, the area designated for treatment will be considered as an integral component of the sewage treatment facility."*

3) **PART D: CONDITIONS APPLYING TO WASTE DISPOSAL – Point 1:** Point 1 states;

> *"Prior to commissioning the Enhanced Sewage Disposal Facility, the Licensee shall direct all sewage to the Sewage Disposal Facility. Following construction of the Enhanced Sewage Disposal Facility, the Licensee shall direct all sewage to the Enhanced Sewage Disposal Facility, or as otherwise approved by the Board in writing."*

According to Part A – Scope and Definitions, the "Enhanced Sewage Disposal Facility" is defined as the comprised area of the engineered upper and lower sewage lagoons and decant structures designed to contain and treat sewage as described in the application for water licence renewal. In addition, the "Sewage Disposal Facility" is defined as comprising the area an engineered lagoon and decant structures designed to contain sewage as described in the application for water licence filed by the applicant on May 17th, 2001.

The Enhanced Sewage Disposal Facility shall encompass the Sewage Disposal Facility as defined in the water licence and described above, therefore it is impractical to construct the Enhanced Sewage Disposal Facility if the Sewage Disposal Facility is operational. The intention of the design was to maintain the use of the current disposal system until such as time as the Enhanced Sewage Disposal Facility could be constructed.

4) **PART D: CONDITIONS APPLYING TO WASTE DISPOSAL – Point 2:** This point references the effluent discharge requirements and the monitoring program. Reference is made to monitoring at Station KIM-3 at the Sewage Disposal Facility and KIM-6 and KIM-7 at the Enhanced Sewage Disposal Facility. KIM-3 is described as the effluent discharged to the existing Sewage Disposal Facility. KIM-6 is the Enhanced Sewage Disposal Facility, lower lagoon spillway. KIM-7 is the Enhanced Sewage Disposal Facility, lower lagoon pump discharge. As mentioned above, the "Sewage Treatment Facility" can not be operational during the construction of the Enhanced Sewage Disposal Facility", and KIM-3 will cease to exist with the construction of the Enhanced Sewage Disposal Facility. Therefore the hamlet will not be able to compile with this requirement

5) **PART D: CONDITIONS APPLYING TO WASTE DISPOSAL – Point 2:** The effluent listed includes the BOD_5 at 120mg/L and Total Suspended Solids at 180 mg/L. These criteria have to be met at KIM-6 and KIM-7 which is at the discharge point for the lower lagoon system.

The Design Brief dated January 2008 estimates that effluent quality being released from the lower lagoon at BOD_5 at 216mg/L and Total Suspended Solids at 172 mg/L. Therefore, it can be concluded that the lagoons will marginally meet the treatment for Total Suspended Solids but will not meet the requirements for BOD_5 as per our Design Brief. We had proposed to

meet the effluent requirement as per the previous water licence (which is the same as the new license) through treatment of the Hamlet's waste water through wetlands treatment. We have clearly stated in the Design Brief that the lagoon system is the first part of the system and will not meet these criteria.

The Guidelines for Discharge of Domestic Wastewater In Nunavut prepared for the Nunavut Water Board in 2000, in section 6.4 states:

> *"Where the land is used as part of the treatment system, limits may be chosen to suit the point of measurement and control."*

Based on this statement we believe if the outlet of the lower lagoon is the point of measurement and control, the effluent parameters should better reflect the level of treatment anticipated.

6) **PART H – CONDITIONS APPLYING TO THE MONITORING PROGRAM – Item 1:** With regards to the requirements at monitoring stations KIM-3, KIM-4, KIM-5 and KIM-6 and KIM-7, there is a requirement to monitor the volume of discharge on a monthly and annual basis. For KIM-3, KIM-4 and KIM-6 this discharge is via spillway and monitoring the volume will be challenging. For KIM-5 and KIM-7 at the pump discharge it would be possible to estimate the sewage based on pumping rates and duration of the pumping operation. Traditionally, the sewage generation rates and therefore the sewage being discharged into the lagoons are closely equal to the water consumption rates. This estimation of the volumes of sewage being treated would tend to be much more accurate than any estimation that could be made through the monitoring of the sewage lagoons for volume of discharge.

Should you have additional questions, or require additional information with regards to the above comments, we remain available and can be contacted at 613-225-9940 ext. 257.

Yours truly,

Trow Associates Inc.

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