



Indian and Northern
Affairs Canada

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Our reference
File #IQA-N 9545-2-3.3BM.ARCA UNC
CIDMS #364063

November 25, 2009

Your reference
3BM-ARC0810/TR/B10, B15, D10, F1, H16

Richard Dwyer
Licensing Administrator
Nunavut Water Board
P.O. Box 119
Gjoa Haven, Nunavut X0E 1J0

Sent Via Email

Dear Richard,

**Subject WATER LICENSE #3BM-ARC0810, HAMLET OF ARCTIC BAY, QIKIQTANI
REGION, GOVERNMENT OF NUNAVUT DEPARTMENT OF COMMUNITY
AND GOVERNMENT SERVICES SUBMISSION PURSUANT TO PART B,
ITEM #10; PART B, ITEM #15; PART D, ITEM #10, PART F, ITEM #1; AND,
PART H, ITEM #16 OF THE LICENSE**

Please be advised that on behalf of Indian and Northern Affairs Canada, I have completed a review of the above referenced submission made by the Government of Nunavut's Department of Community and Government Services to the Nunavut Water Board on behalf of the Hamlet of Arctic Bay.

A Technical Review Memorandum (attached) is provided for the Board's consideration.

Should you have any questions regarding this submission, feel free to contact me at 867-975-4555 or David.Abernethy@inac-ainc.gc.ca.

Regards,

David W. Abernethy
Water Resources Regional Coordinator
Operations Directorate, Nunavut Regional Office
Indian and Northern Affairs Canada
P.O. Box 100
Iqaluit, Nunavut X0A 0H0

Attached.

Cc: Ian Rumbolt, Acting Manager of Water Resources – Iqaluit, NU
 Peter Kusugak, Manager of Field Operations – Iqaluit, NU
 Andrew Keim, Water Resource Officer – Iqaluit, NU

TECHNICAL REVIEW MEMORANDUM

Date: Nov. 25/09

To: Richard Dwyer, Nunavut Water Board

From: David Abernethy, Indian and Northern Affairs Canada

Re: **WATER LICENSE #3BM-ARC0810, HAMLET OF ARCTIC BAY,
QIKIQTANI REGION, GOVERNMENT OF NUNAVUT
DEPARTMENT OF COMMUNITY AND GOVERNMENT
SERVICES SUBMISSION PURSUANT TO PART B, ITEM #10;
PART B, ITEM #15; PART D, ITEM #10, PART F, ITEM #1; AND,
PART H, ITEM #16 OF THE LICENSE**

A. PROJECT DESCRIPTION

On Oct. 9/09 the Nunavut Water Board (NWB or Board) distributed a Sept. 1/09 Government of Nunavut Department of Community and Government Services (GN-CGS) submission that was made on behalf of the Hamlet of Arctic Bay to interested parties for review. This submission is pursuant to the following license conditions,

1. Part B, Item #10

The Licensee shall submit to the Board for approval in writing, within thirty (30) days of License issuance or upon the filing of any application in relation to the License within that time, a Plan for Compliance that clearly demonstrates the measures the Licensee will undertake, including an implementation schedule, to achieve full compliance with the conditions of this License, including the issues raised in the Inspector's Reports.

2. Part B, Item #15

The Licensee shall submit to the Board for review, within thirty (30) days of License #3BM-ARC0810 Amendment #1 issuance, all available data generated under License #NWBARC0207 and subsequent renewal #3BM-ARC0810.

3. Part D, Item #10

The Licensee shall submit to the Board for review within thirty (30) days of the issuance of this License amendment, a report identifying each Final Discharge Point of the existing Sewage Disposal Facility. This report shall at least include,

- a. Plans, specifications, geographic coordinates, and a general description of each Final Discharge Point; and,
- b. A description of how each Final Discharge Point is designed and maintained.

4. Part F, Item #1

The Licensee shall submit to the Board for approval in writing, within sixty (60) days of issuance of this License Amendment, an Operations and Maintenance Manual prepared where appropriate, in accordance with the *Guidelines for the Preparation of an Operation and Maintenance Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories; 1996*. This Manual shall take into consideration comments received during the application review process as well as any Inspector reports, and shall contain the following plans,

- a. Water Supply Facilities Operation and Maintenance Plan;
- b. Solid Waste Operation and Maintenance Plan;
- c. Sewage Operation and Maintenance Plan for the existing Sewage Disposal Facility and the new Wastewater Treatment Facility;
- d. Sewage Sludge Management Plan;
- e. Hazardous Waste Management Plan;
- f. Spill Contingency Plan including a Spill Response Plan for aggregate deposits;
- g. Monitoring Program Quality Assurance / Quality Control Plan including a diagram that references Monitoring Program Station Numbers; and,
- h. Instrumentation Monitoring and Surveillance Plan (This Plan is due within 30 days of issuance of this License Amendment. See Part H, Item #16)

5. Part H, Item #16

The Licensee shall submit to the Board for approval in writing, within thirty (30) days of issuance of this License Amendment, a detailed Instrumentation Monitoring and Surveillance Plan for inclusion in the Operations and Maintenance Manual, required under Part F, Item #1(h). This Plan shall include,

- a. Details of the proposed instrumentation plan, the frequency of measurements and trigger values or observations for remedial action;
- b. A review of geothermal monitoring plans including the number of thermistors to be installed, the location of thermistor installations, the

installation of thermistors within the key trench, the depth of thermistor strings in subgrade soils, justification for the final chosen depth of thermistor strings, and the final detailed design of thermistor strings, taking into consideration review comments; and,

- c. Details of settlement monitoring at the upstream and downstream toes of the berms.

The following documents were reviewed when preparing this Technical Review Memorandum,

- GN-CGS Cover Letter, dated Sept. 1/09;
- Appendix A: Part B, Item #10; Part B, Item #15; and, Part D, Item #10);
- Appendix B: Part F, Item #1 and Part H, Item #16.
- INAC Aug. 4/07 Inspection Report, dated Jan. 14/08;
- INAC July 11/09 Inspection Report, dated July 11/09;
- NWB Water License #3BM-ARC0810 Amendment #1, dated Apr. 16/09;
- NWB Water License #3BM-ARC0810, dated Mar. 17/08;
- NWB Water License #NWB3ARC0207, dated Mar. 2/05; and,
- NWB Water License #NWB3ARC0207, dated Nov. 1/02.

B. RESULTS OF REVIEW

The following comments / recommendations are provided for the Board's consideration,

1. Part B, Item #10

- The Licensee must submit a stand alone Plan for Compliance that meets the requirements stated in Part B, Item #10 of the License.;
- The Plan for Compliance must address as a minimum, Annual Reporting requirements (Part B, Item #1 of the License), Operational Plan requirements (Part F, Item #1 of the License), and issues raised in the Inspector's Reports;
- The July 11/09 Inspector's Report states that "no records were found regarding the treatment or monitoring of chlorine levels" and "consumption records were not available for review." INAC recommends that these issues be addressed in the Licensee's Plan for Compliance and that these records be kept at both the Potable Water Supply station and Hamlet Office effective immediately;

- The submitted Plan states, “The operator is testing chlorine residual in each and every truck load of water. Once the result satisfies the National drinking water guidelines, only then the truck load of water is distributed to the individual house as safe drinking water.” INAC recommends that all chlorine residual test results be kept at the Potable Water Supply station and at the Hamlet Office effective immediately;
- The submitted Plan states, “The Hamlet sends drinking water samples to the Lab of Iqaluit Health Department once a month for Quality Assurance and Quality Control (QA/QC) purposes.” The Licensee must keep all monitoring results at their Potable Water Supply station and Hamlet Office effective immediately;
- The submitted Plan states that Operations and Maintenance (O&M) Manuals for the Land fill and Bulky Metal Management Sites are not available and that QA/QC Plans and Plans for Compliance are difficult to implement for such facilities. “Once funds are available, new facilities will be built satisfying the requirements of the Community Water License. Proper O&M Manuals, QA/QC Plans, and Plans for Compliance will be developed for the new waste management facilities once they are built and commissioned.” According to Part F, Item #1 of the License, the Licensee must submit an O&M Manual that includes a Solid Waste Disposal Facility O&M Plan and a Monitoring Program QA/QC Plan. These are License terms and conditions that must be followed. The Licensee must submit these Plans in a comprehensive O&M Manual that addresses all existing and any planned facilities;
- The Aug. 4/07 Inspector’s Report states that the Licensee must maintain appropriate signage for their Monitoring Program. This requirement should be addressed in a revised Plan for Compliance;
- The Aug. 4/07 Inspector’s Report states, “waste management in the community continues to be below an acceptable standard because of the problems at both the solid waste management area and the sewage lagoon” (i.e., no segregation of materials and poor water management at the solid waste management area and erosion of existing sewage lagoon berms). The Licensee’s Plan for Compliance must be revised to include a detailed description of how these facilities will be maintained / repaired along with a schedule for the construction and commissioning of any new facilities; and;
- July 11/09 Inspector’s Report states that there were “obvious signs of erosion and failure of the lagoon walls at the time of inspection. Downhill of the lagoons it was noted that work on retention berms had continued to slow the flow of sewage released from the Lagoon’s two cells.” INAC recommends that the licensee repair the walls of the lagoon and regularly check the lagoon for areas of concern to prevent failure.

2. Part B, Item #15

- The Licensee has not submitted Annual Reports for 2007 and 2008. To satisfy the above-referenced License condition, all data generated under the License (which are typically addressed through Annual Reports) must be submitted to the Board for review. The Licensee must submit all available information and as part of their Plan for Compliance, ensure that all license information requirements are followed;
- The GN-CGS submission states that “once the new wastewater facility is built and commissioned, the Hamlet will develop a testing program with Caduceon Environmental Laboratories (Ottawa, ON) in order to keep the facility under compliance.” The Licensee must maintain License compliance at all times. The monitoring program requirements specified in Part H of the License apply to both existing and new facilities covered by this License. The Licensee’s monitoring program must be implemented; and,
- The GN-CGS submission states that “the Solid Waste Disposal Facility is not a standard designed facility. No samples were taken and tested so far. But once the capital funds are made available, a new facility will be designed and built satisfying the guidelines of the NWB and sampling, testing, and O&M will be followed accordingly.” As stated above, the monitoring program requirements specified in Part H of the License apply to existing and new facilities covered by this License. The Licensee’ Monitoring Program and submission an O&M Plan specific to the existing Solid Waste Disposal facility must be implemented.

3. Part D, Item #10

- The GN-CGS submission does not include the information required by this License condition. It mentions that there are “two (2) disposal points in principal,” one at the end of the lagoon and one at the end of the wetland prior to the release of treated effluent into the sea. It does state that “the disposal point at the end of the lagoon is the compliance point and the second one is the final monitoring point.”; and,

A stand-alone report must be submitted to the Board for review, containing the information required by this License condition. This report should include a diagram and photos identifying each Final Discharge Point for the existing Sewage Disposal Facility. Monitoring Station (MS) #ARC-3, “Effluent discharged from the Final Discharge Point of the Sewage Disposal Facilities,” listed in Part H of the License must be identified. Furthermore, INAC recommends that the planned Final Discharge Point for the new Wastewater Treatment Facility be.

4. Part F, Item #1

- It is noted that the submitted Operations and Maintenance (O&M) Manual is in draft format and does not contain the Plans identified in the above-referenced License condition. INAC recommends that the Licensee be required to submit revised Plan that is finalized and ready for review;
- The emphasis of the submitted O&M Manual is on municipal wastewater treatment. It is recommended that this issue be addressed in a Sewage Operation and Maintenance Plan for the existing Sewage Disposal Facility and the new Wastewater Treatment Facility as required by the above-referenced License condition. This Plan should include a diagram(s) and photos that present the existing Sewage Disposal Facilities and the new Wastewater Treatment Facility (along with the Vegetated Filter Strip Wetland). All monitoring stations specified in the License must be referenced;
- Chapter 3 of the submitted O&M Manual makes reference to design values and formulas for estimating water consumption and sewage generation rates from a document titled, "Water and Sewage Facility Capital Program Standards and Criteria." A copy of this document cannot be found. This document must be properly cited in a revised Sewage Operation and Maintenance Plan;
- INAC recommends that the O&M Manual include potable water consumption and sewage generation rates for the Hamlet of Arctic Bay based on monitoring results from the License' Monitoring Program. This Manual should be revised each year to include current monitoring results and allow for the comparison of results over time;
- Table 3.5 – Effluent Quality Standards, included in Chapter 3 of the submitted O&M Manual provides incorrect effluent quality standards for the new Wastewater Treatment Facility. Criteria for the existing Sewage Disposal Facilities at MS #ARC-3 are provided in the manual, however the criteria for the new Wastewater Treatment Facility at MS# ARC-8 should have been provided instead;
- Table 6.1 – Monitoring Points, included in Chapter 6 of the submitted O&M Manual, does not reference the correct Monitoring Program Stations for wastewater treatment listed in Part H of the License. The correct monitoring stations for the existing and planned new facilities must be included along with the descriptions provided in Part H of Amendment #1 to License #3BM-ARC0810;
- Table 6.2 – Sampling Frequency, included in Chapter 6 of the submitted O&M Manual, must be revised to include all wastewater treatment monitoring stations and their corresponding frequencies identified in Part H of Amendment #1 to License #3BM-ARC0810;
- Table 6.3 – Effluent Criteria at the Compliance Point, included in Chapter 6 of the submitted O&M Manual provides the quality standards that must be met for all effluent discharged from the new Wastewater Treatment

Facility at Monitoring Program Station #ARC-8. This Monitoring Program Station is not referenced in this section of the Manual. INAC recommends that the final version of this Manual reference the Monitoring Program Station assigned to this compliance point (i.e., MS #ARC-8);

- A draft Spill Response Plan for the Wastewater Treatment Facility has been included in the submitted O&M Manual. Although the title of this Plan makes reference to municipal wastewater treatment it address emergency response provisions for spills of gasoline, diesel fuel, hydraulic oil, motor oil and other lubricants, antifreeze, and coolants. The Licensee must provide spill response and spill prevention provisions for their wastewater treatment facility. As a minimum, this Plan must include standard information included in Spill Response Plans such as a description of the wastewater treatment facility (including a diagram), municipal contacts, contact information for those who will be notified of a spill (including the INAC the Field Operations Division), equipment available for use to respond to any spills, and be finalized; and,
- Part F, Item #1(f) of the License requires the inclusion of a Spill Response Plan for aggregate deposits. The submitted draft Spill Response Plan does not make reference to any aggregate deposits. The Licensee must revise this Plan to ensure that it addresses this License requirement.

5. Part H, Item #16

- A detailed Instrumentation Monitoring and Surveillance Plan for inclusion in the Operations and Maintenance Manual was not included in the distributed GN-CGS submission as indicated in the NWB review notice. The Licensee must submit to the Board for approval a Plan that meets the requirements specified in this License requirement.

Prepared by David W. Abernethy

Cc: Ian Rumbolt, Acting Manager of Water Resources – Iqaluit, NU
Peter Kusugak, Manager of Field Operations – Iqaluit, NU
Andrew Keim, Water Resource Officer – Iqaluit, NU