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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

File No.: 3BM-CLY0909

March 19, 2009

Mr. Sandy Kautuq
Assistant Senior Administrative Officer
Municipality of Clyde River
Box 89
Clyde River, NU
X0A 0E0

RE: NWB Licence No. 3BM-CLY0909

Dear Mr. Kautuq:

Please find attached Licence No. 3BM-CLY0909 issued to the Hamlet of Clyde River by the Nunavut Water Board (NWB) pursuant to its authority under Article 13 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada*. The terms and conditions of the attached Licence related to water use and waste disposal are an integral part of this approval.

If the Licensee contemplates the renewal of this Licence, it is the responsibility of the Licensee to apply to the NWB for its renewal. The past performance of the Licensee, new documentation and information, and issues raised during a public hearing, if the NWB is required to hold one, will be used to determine the terms and conditions of the Licence renewal. Note that if the Licence expires before the NWB issues a new one, then water use and waste disposal must cease, or the Licensee will be in contravention of the *Nunavut Land Claims Agreement* (NLCA) and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWSRTA). However, the expiry or cancellation of a licence does not relieve the holder from any obligations imposed by the licence. The NWB recommends that an application for the renewal of this Licence be filed at least three (3) months prior to the Licence expiry date.

If the Licensee contemplates or requires an amendment to this Licence, the NWB may decide, in the public interest, to hold a public hearing. An application for amendment may be required for upgrades to the solid waste disposal facility. The Licensee should submit applications for amendment as soon as possible to give the NWB sufficient time to go through the amendment process. The process and timing may vary depending on the scope of the amendment, however a minimum of sixty (60) days is required from time of acceptance by the

NWB. It is the responsibility of the Licensee to ensure that all application materials have been received and acknowledged by the Manager of Licensing.

The NWB strongly recommends that the Licensee consult the comments received from interested persons on issues identified. This information is attached for your consideration.

Sincerely,

A handwritten signature in dark ink, appearing to read 'T. Kabloona', with a stylized, flowing script.

Thomas Kabloona
Nunavut Water Board, Chair

TK/tla/kt

Enclosure: Licence No. 3BM-CLY0909
 Comments from EC, GN-DoE, INAC, and GN-CLEY

cc: Qikiqtani Distribution List



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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

DECISION

LICENCE NUMBER: 3BM-CLY0909

This is the decision of the Nunavut Water Board (NWB) with respect to an application for a Licence renewal received August 19, 2008 made by:

HAMLET OF CLYDE RIVER

to allow for the use of water and disposal of waste for the Hamlet of Clyde River, located within the Qikiqtani region of Nunavut. With respect to this application, the NWB gave notice to the public that the Hamlet had filed an application for a water licence renewal.

DECISION

After having been satisfied that the application was exempt from the requirement for screening by the Nunavut Impact Review Board in accordance with S. 12.3.2 of the *Nunavut Land Claims Agreement* (NLCA), the NWB decided that the application could proceed through the regulatory process. After reviewing the full submission of the Applicant and written comments expressed by interested parties, the NWB, having given due regard to the facts and circumstances, the merits of the submissions made to it and to the purpose, scope and intent of the NLCA and of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSTRTA), decided to waive the requirement to hold a public hearing and determined that:

Licence Number 3BM-CLY0909 be issued subject to the terms and conditions contained therein. (Motion #: 2008-20-L03)

SIGNED this 18th day of March, 2009 at Gjoa Haven, NU.

Thomas Kabloona
Nunavut Water Board, Chair

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I. BACKGROUND

The Hamlet of Clyde River has a population of approximately 940 and is located on Patricia Bay on the east coast of Baffin Island at the coordinates of 70°27'N latitude and 68°33'W longitude within the Qikiqtani Region of Nunavut.

Currently, the annual average wastewater discharge volume of the community is approximately 36,000 cubic metres. The existing wastewater treatment facility is undersized to satisfy the present demand of the community and has not fully complied with the current water licence NWB3CLY0308. A condition assessment study in 2003 recommended expansion of the existing facility, and, a new lagoon was designed to operate jointly with the existing facility so that both lagoons could function as storage cell lagoons and work in conjunction with an area of wetlands.

The project has been designed for a 20 year lifetime with a storage capacity of 58,500 cubic metres. Construction was to begin during the summer of 2008, however construction is currently planned for the 2009 and 2010 seasons.

II. PROCEDURAL HISTORY

The NWB issued municipal water licence NWB3CLY0308 to the Hamlet of Clyde River on September 15, 2003, to allow for the use of water and disposal of waste.

On October 8, 2008, following a detailed assessment of an amendment application filed by the Licensee in conjunction with the Government of Nunavut Community Government Services (GN-CGS), the Board issued an amendment to water licence NWB3CLY0308 to allow for new activities to be carried out including:

- Rehabilitation of the existing Sewage Disposal Facility comprised of a sewage lagoon;
- Construction of a new sewage treatment cell to the south and west of the existing lagoon;
- Controlled effluent release to a Vegetated Filterstrip Wetland Area that is approximately 720 meters long, 325 meters wide, and flows into the marine environment at Patricia Bay; and
- Quarry development.

The original licence NWB3CLY0308 expired on September 15, 2008, during the licensing process for the requested amendment. Given that a renewal application for NWB3CLY0308 had been filed during the amendment process, the NWB extended the expiry date of the licence by six (6) months, from September 15, 2008 to March 15, 2009, to allow for processing of the renewal application and work to proceed under the amendment.

The application for renewal was submitted to the NWB by the Hamlet of Clyde River, in

conjunction with the GN-CGS on August 19, 2008. Information contained in the August 19, 2008 submission included:

- Application renewal cover letter signed by Sandy Kautuq, Assistant Senior Administrative Officer (SAO) for the Hamlet of Clyde River, dated August 19, 2008;
- Application summary in English;
- Application summary in Inuktitut;
- Water licence application form; and
- Municipal Questionnaire;

Following a preliminary review of the application documents, on October 30, 2008, the NWB requested a response and clarification on a few issues prior to distributing the application including:

- Anticipated changes to the solid waste disposal facility;
- Further changes to the sewage disposal facility;
- Hazardous waste disposal; and
- Compliance.

Subsequently, the Licensee submitted a document entitled *draft Spill Response Plan Aggregate Deposits, Clyde River, Nunavut*, prepared by Trow Associates Inc. (Trow), dated November 2008, Project no. OTCD00019055A.

On December 3, 2008 the GN-CGS submitted a response to the NWB's request and on December 8, 2008, the NWB publicly posted notice of the application in accordance with Section 55.1 of the Act and Article 13 of the *Nunavut Land Claims Agreement* (NLCA). This assessment process included the referral of the application to a variety of federal, territorial, and local organizations for review and comment.

No public concern was expressed during this review. Therefore, the NWB waived the requirement to hold a public hearing and proceeded with the application process.

The NWB received comments on the application from interested parties including Indian and Northern Affairs Canada (INAC), the Government of Nunavut Department of Environment (GN-DOE), the GN Department of Culture, Language, Elders, and Youth (CLEY), and Environment Canada (EC).

In addition, on January 8th, 2009, Trow submitted comments to the NWB on behalf of the GN-CGS regarding the water licence amendment to NWB3CLY0308, expressing concerns regarding the final discharge point for the Enhanced Sewage Disposal Facility, the discharge criteria, and the requirement within the Licence for sewage effluent to be proven non-acutely toxic.

On February 13th, 2009, the NWB facilitated a technical meeting via teleconference including representatives of GN-CGS, Trow, INAC, EC, and GN-DOE to discuss among other things the concerns outlined in Trow's January 8th, 2009 letter as well as the NWB's concerns regarding compliance with the amended licence NWB3CLY0308. This teleconference was followed up with a distribution of the meeting notes via email on March 3, 2009.

Based on the results of the detailed assessment of the renewal application file, including consideration of any potential accidents, malfunctions, or impacts to water that the overall project might have in the area, the Board has approved the application and has issued licence 3BM-CLY0909.

III. ISSUES

Compliance and Term of Licence

In accordance with Section 45 of the Act, the NWB may issue a licence for a term not exceeding twenty-five years. In determining an appropriate term of a water licence, the Board considers a number of factors, including the results of INAC site inspections and the overall compliance record of the Applicant. In review of the previous water licence NWB3CLY0308 inspection reports, the NWB has noted that there were compliance issues and other related problems identified by the Inspector. A Municipal Water Use Inspection Report dated August 8, 2006 included the following issues:

- Unacceptable decant structure; and
- Insufficient freeboard

Another inspection conducted on July 13th, 2007 and reported on December 4, 2007 identified additional compliance issues and related problems including:

- Failure to submit annual reports including the results of the monitoring program;
- Failure to maintain the appropriate signage and warnings at Surveillance Network Program stations;
- Structural issues with the sewage lagoon;
- Failure to submit a Sewage and Solid Waste Disposal Operations and Maintenance Manual; and
- Failure to collect and submit for analysis the samples required as part of the Monitoring Program.

In addition, the NWB notes INAC's comments on the application submitted January 2, 2008 with respect to Part B Item #10 of amended licence NWB3CLY0308, requiring the Licensee to submit a Plan for Compliance within ninety (90) days of licence issuance or upon the filing of any application in relation to the licence within that time. To date, the NWB has not received a Plan for Compliance.

Through its own compliance assessment the NWB notes that the Quality Assurance/ Quality Control (QA/QC) Plan required as a condition of Part H Item 6 of amended licence NWB3CLY0308 to be submitted to the Analyst within sixty (60) days of Licence issuance, has not, to this date, been received by the NWB. Also, the Board is not in receipt of as-built drawings of any modifications to the existing Sewage Disposal Facility required in accordance with Part E Item 4 of licence NWB3CLY0308.

In its August 19th water licence application form, the Hamlet indicated a request for a term of five (5) years for the Licence renewal (September 15, 2008 to September 15, 2013). No comments were received from interested parties with respect to the length of term, however, based on issues with non-compliance that are related to the 2003 Licence renewal and again with the issuance of the Amendment No.1 in October, 2008, including non-compliance with administrative and reporting requirements, the NWB has decided on an eight month term for the Licence.

The eight month Licence term is intended to provide the Licensee time to take immediate action towards achieving full compliance with all Licence requirements for its existing facilities and to begin and complete the first year's construction of its Enhanced Sewage Disposal Facility, as part of this process. Upon submission of an application to renew the Licence in approximately five (5) months from the date of this Licence, the Board fully expects the Hamlet to be in compliance with the Licence. As per Part B, Item 12 of the Licence, the Licensee must submit a Plan for Compliance that clearly demonstrates how the Hamlet will achieve full compliance with the Licence conditions during this time period and subsequent licence term(s).

The NWB reminds the Licensee of its responsibility to be in compliance with the conditions of the Licence. If monitoring results demonstrate that effluent does not meet discharge limits, the Licensee is required to take the necessary measures to correct the situation and maintain compliance.

Plan for Compliance

INAC noted in its comments dated January 2, 2008 regarding the condition of Part B Item 10 of amended licence NWB2CLY0308 requiring the Licensee to submit to the Board for approval, within ninety (90) days of licence issuance or upon the filing of any application in relation to the Licence 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 the licence. This Plan was to include the issues raised in the inspector's reports. The Plan has not been received by the NWB. Although information was provided following a Teleconference meeting on February 13, 2009, the submission was not considered acceptable as the specific content requested was not provided and the document was poorly organized which included numerous scanned, secondary documents that were unreferenced. The NWB therefore requires that the Licensee, as a condition of this Licence renewal, submit a "Plan

For Compliance” to the Board, within a reduced time frame of **thirty (30) days** following the issuance of this renewal, for approval in writing.

Quality Assurance/ Quality Control Plan (QA/QC Plan)

The Licensee to this date, has not submitted a QA/QC Plan as required in Part H Item 6 of amended licence NWB3CLY0308. As with the Plan for Compliance above, the NWB did receive, following the Teleconference of February 13, 2009, a submission that included several, unreferenced documents that somewhat inferred to be Quality Control and Quality Assurance procedures for monitoring, sampling and analyses. However this information was considered incomplete and therefore, the NWB requires that the Licensee, as a condition of this Licence renewal, submit a QA/QC Plan within **sixty (60) days** of issuance of this Licence renewal that has met the conditions of Part H, Item 13. This Plan is to be developed immediately in consultation with a Canadian Association of Environmental Analytical Laboratories (CAEAL) approved laboratory, chosen to perform the analyses required under Part H and Schedule 1, to address both the field and laboratory requirements of monitoring for this Licence under Part H. In addition, this Plan will need to be updated for inclusion in the Operation and Maintenance Plan for the Enhanced Sewage Disposal Facility as required in Part F Item 2.

Annual Report

The previous licence NWB3CLY0308 included a condition requiring the submission of annual reports. As identified by the inspector, annual reporting including the results of the monitoring program have not been submitted. The GN-CGS advised the Board in its December 3, 2008 response to the NWB’s preliminary technical review that a monitoring program has been set up and the Hamlet staff are being trained. The Hamlet has been advised by the GN-CGS to follow-up on the annual report and to attach all laboratory test results with the annual report.

The NWB will maintain the condition in the License to produce annual reports. These reports are for the purpose of ensuring that the NWB has an accurate annual update of municipal activities during a calendar year with respect to water use and waste disposal. This information is maintained on the public registry and is available to interested parties upon request. A “*Standardized Form for Annual Reporting*” is to be used by the Licensee and is available for use by the Licensee at the NWB’s ftp site at:

<ftp://nunavutwaterboard.org/ADMINISTRATION/Standardized%20Forms/>.

Although an Annual Report has been received by the NWB for 2008, not all data generated under Part H, Monitoring Program was included. The Board is requiring the Licensee to submit all data generated under the previous Licence NWB3CLY0308 and the Amendment No.1 “Monitoring Program” to the Board within thirty (30) days of issuance of this Licence, 3BM-CLY0909.

Operational Plans

The previous licence NWB3CLY0308, included a condition in Part F Item 1 requiring the submission of a Plan for the Operation and Maintenance (O&M) of the Sewage and Solid Waste Facilities before March 31, 2004. This plan has not been received. During the amendment process for NWB3CLY0308, the Licensee submitted a draft O&M Manual outline and indicated during a teleconference that a complete O&M Manual would be available prior to commissioning the Enhanced Sewage Disposal Facility. The amended licence NWB3CLY0308 continued to require submission of an O&M Manual for facilities currently in use, adding a condition that this Manual be revised and submitted ninety (90) days prior to commissioning of the Enhanced Sewage Disposal Facility, for approval of the Board in writing.

The O&M Manual required under Part F, Item 1, to be submitted within **sixty (60) days** following issuance of the Licence, and revision under Part F, Item 2 is to be developed to the satisfaction of the NWB and shall include plans for;

- a) the operation and maintenance of Water Supply Facilities;
- b) the operation and maintenance of **ALL** sewage and solid waste disposal facilities;
- c) hazardous waste management procedures;
- d) the management of sludge from the Sewage Disposal Facility and Enhanced Sewage Disposal Facility;
- e) the protection of the environment with regard to potential spills through day-to-day operations through a Spill Contingency Plan; and
- f) include a monitoring program Quality Assurance/Quality Control Plan.

The Board acknowledges receipt of the document entitled *draft Spill Response Plan Aggregate Deposits, Clyde River, Nunavut*, prepared by Trow Associates Inc., dated November 2008, Project no. OTCD00019055A, submitted in accordance with Part F Item 6 of the amended licence NWB3CLY0308. As recommended by INAC, GN-DOE and EC in their written comments, the Board is requiring that this plan be revised and updated to address the parties' comments and be incorporated into the O&M Manual discussed above, for submission ninety (90) days prior to commissioning of the Enhanced Sewage Disposal Facility.

The purpose of the O&M Manual is to assist Hamlet staff in carrying out the procedures relating to the water use and waste disposal facilities. The O&M Manual should demonstrate to the NWB that the Hamlet is capable of operating and maintaining the infrastructure related to water use and waste disposal and to meet the requirements of the Licence. The O&M Manual should be based, at a minimum on the various NWB-approved guidelines available (i.e. *Guidelines for the Preparation of an Operations and Maintenance Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories*, Duong and Kent, 1996) and other regulatory guidelines as deemed appropriate.

Quarry

The design of the Enhanced Sewage Disposal Facility as described in the application for amendment to water licence NWB3CLY0308, requires in excess of 40,000 cubic metres of granular material. Since the Hamlet's current quarry sites are being used for municipal needs and do not have sufficient material to complete the project, a new quarry site was approved for development under the amendment.

This quarry development underwent an environmental screening by NIRB and on June 18, 2008, NIRB issued its screening determination for file #08QN055 recommending that the project proposal proceed subject to specific terms and conditions. Conditions related to the mandate of the NWB regarding the use of water and disposal of waste, were incorporated into the amendment of NWB3CLY0308 and have been forwarded into this renewal.

In addition, the NWB is continuing to require as a new condition of the Licence amendment, that an undisturbed buffer zone of at least 100 metres be maintained between any proposed quarry operation and the normal high water mark of any water body.

Water Use

The Hamlet of Clyde River currently uses Water Source Lake as its source of potable water with the quantity not to exceed 38,000 cubic meters annually. No concerns were raised by the parties in their written submissions as to the amount of water required by the Hamlet, the manner in which it is obtained, or the manner in which it will be used. The NWB has renewed the terms and conditions associated with water use accordingly.

Sewage

The Hamlet of Clyde River currently utilizes a Sewage Disposal Facility approximately 1.2 km west of the municipality. Currently, the Sewage Disposal Facility is a single-cell exfiltration lagoon with a capacity of 19,500 m³. The effluent that exfiltrates from the lagoon berm proceeds downstream through an undefined natural wetland where it receives additional treatment prior to reaching the marine environment. The Board notes that to date no as-built drawings of the existing Sewage Disposal Facility have been received by the NWB in accordance with Part E Item 4 of licence NWB3CLY0308.

With an annual average wastewater discharge volume from the community of an estimated 36,636 cubic metres, the existing Sewage Disposal Facility is undersized and has failed to meet the effluent quality criteria of the Licence. As such, expansion of the existing facility was approved by the NWB in the scope of the amendment to water licence NWB3CLY0308, including the construction of a new lagoon to the south and west of the existing lagoon to supplement the current storage capacity.

The land between the current facility (and approved expansion) and Patricia Bay was also approved in the scope of the amendment to water licence NWB3CLY0308 to remain as a Vegetated Filter Strip Wetland Area. The treated sewage effluent will be pumped from the lagoon to the wetland area beginning in mid-August and continuing until mid to late September. The end of the Vegetated Filter Strip Wetland Area is located approximately 720 metres from the discharge point of the sewage lagoon, at Patricia Bay.

The Board acknowledges comments submitted by Trow Associates Inc. regarding the conditions of Amendment No.1 to water licence NWB2CLY0308, on the following three sewage related issues:

1. the final discharge point for the Enhanced Sewage Disposal Facility;
2. the discharge criteria for effluent discharged from the Enhanced Sewage Disposal Facility; and
3. the requirement for effluent discharged from the Enhanced Sewage Disposal Facility to be proven non-acutely toxic.

With respect to the first issue regarding Trow's concern with the contradictory nature of the inclusion of two separate Final Discharge Points and criteria, one at the discharge point of the sewage lagoon, and the second at the discharge of the wetlands, the Board does not fully agree with the argument provided by Trow. Trow argues that the final discharge point should be considered to be the end of the wetlands as the operator can control the rate of sewage applied to the wetlands and therefore has control of the quality of treatment from the wetlands. As noted by EC in their comments dated January 16, 2009 in response to Trow's concern, "real time" data is not available for effluent quality and in order to consider the wetland area discharge as a compliance point, real time data and evidence of treatment efficiency is required. As such, the Board has decided that in order to minimize the potential for release of poor quality effluent to Patricia Bay, that the Final Discharge Point and point of compliance be located at the point of discharge from the lagoon to the Vegetated Filter Strip Wetland Area. In order to determine the performance of the wetland as a secondary treatment system, the Board further requires that the quality of effluent leaving the wetland be monitored and reported.

With respect to the second issue regarding Trow's concern with the discharge criteria, the Board has agreed with Trow. The Board also notes EC's January 6, 2009 comments recommending that effluent quality standards applied to this licence should be at least equivalent to those outlined in the 1992 document "Guidelines for discharge of treated municipal wastewater in the Northwest Territories". According to Table 4.1 of the Guidelines, for a wastewater flow greater than 600 lcd, during summer months into a marine receiving environment, the discharge criteria for BOD₅ should be 80 mg/L and the discharge criteria for TSS should be 70 mg/L. Taking into consideration note (k) to Table 4.1 of the Guidelines which states that where wetlands are to be used as part of the treatment systems, limits may be chosen to suit the point of measurement and control, the Board has decided to set limits from the lagoon that are less strict than the 80/70 (BOD/TSS) standards and also, that are consistent with the previous licence NWB3CLY0308 to

take into account the potential for treatment of the wetland area. The discharge criteria for the existing Sewage Disposal Facility include Fecal Coliforms as a licensed parameter and the NWB is maintaining this requirement for the Enhanced Sewage Disposal Facility.

Furthermore, the Board refers the Licensee to EC's January 16th advice regarding the establishment of future discharge criteria for consideration upon licence renewal. EC recommends that the Hamlet investigate using the sewage treatment system to hold sewage in one cell while a longer decant is done from the second cell to take advantage of the growing (treatment) season without overwhelming the wetland vegetation. However, if shorter discharge periods are implemented, lower effluent discharge limits would be appropriate with some allowance made for polishing by the wetlands. EC's recommendations should be considered in the development of the O&M Manual.

With respect to the third issue of Trow's letter, concerning the requirement for effluent to be proven non-acutely toxic and that it is not a requirement of the Canadian Council Ministers of Environment Canada-wide Strategy for the Management of Municipal Wastewater effluent, the Board agrees with Trow, as long as there are no industrial inputs into the system. The Board notes EC's January 16th recommendations in making the decision to remove this requirement and refers the Licensee to EC's statement regarding acute toxicity testing done as part of the risk assessment and monitoring efforts of the CCME Strategy, if logistical constraints can be handled.

Furthermore, in making this decision, the Board also notes EC's January 6th, 2009 submission, advising the Licensee to ensure that any effluent discharged from the system's final discharge point is in compliance with Section 36(3) of the Fisheries Act. According to Section 36(3) of the Fisheries Act, the deposition of deleterious substances of any type, under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter such water, is prohibited. The Licensee is further advised that compliance with this Licence does not absolve the Licensee from the responsibility to comply with other applicable legislation.

Solid Waste

The Hamlet has one Solid Waste Disposal Facility located east of the lagoon. The site is unfenced, waste is not segregated and wastes are burned regularly. A waste oil storage area is located outside the landfill site. A metal dump is also located to the west of the lagoon. At the time of application, it was indicated that budgeting for optimization of the landfill site had been planned under the GN-CGS's Capital Planning Program for the period of 2009-2011.

Recommendations relevant to solid waste disposal operations in the Hamlet were received by INAC, EC, and the GN-DOE regarding waste segregation, fencing, open burning, hazardous waste, drainage management, and planned facility upgrades.

EC recommended that waste segregation practices should be identified and used to ensure removal of salvageable items and hazardous waste materials from the general waste and that dedicated locations should be identified for hazardous wastes, including batteries, waste oil, honey bags, animal carcasses, and contaminated soils. The Licensee is encouraged to consider those recommendations in the development of its O&M Manual and the NWB has modified the condition in Part D Item 7 of NWB3CLY0308 to require the Licensee segregates and stores all hazardous materials and/or hazardous waste, including waste oil, within the Solid Waste Disposal Facility in a manner as to prevent the deposit of deleterious substances into any water until such a time as proper disposal arrangements are made.

EC and GN-DOE both noted in their submissions that the Solid Waste Disposal Facility requires proper fencing. Fencing is required to control the spread of debris and to prevent waste entering waters. All solid waste is to be contained at the Solid Waste Disposal Facility under Part D Item 6 of the renewal Licence.

The Board acknowledges comments received by INAC, EC and GN-DOE regarding the Licensee's practice of open burning and advises the Licensee of the requirement to comply with the *Canada Wide Standards for Dioxin and Furans* and the *Canada Wide Standard for Mercury Emissions* for the management and incineration of municipal wastes. The Licensee is also advised to adhere to the GN-DOE policy document, entitled *Municipal Solid Wastes Suitable for Open Burning*.

EC provided recommendations regarding hazardous waste including waste oil and fuel barrels, as well as recommendations regarding drainage management to minimize leachate generation from the Solid Waste Disposal Facility. The Licensee is encouraged to consider those recommendations in the development of its operating procedures and the O&M Manual.

Finally, the Board notes the Licensee's plans with respect to upgrading its Solid Waste Disposal facility, including an increase in its area, the construction of separate cells for different types of waste, and recycling/waste reduction plans. The Board would like to take the opportunity to advise the Licensee that an application for amendment is required for the planned upgrades to the Solid Waste Disposal Facility. The Licensee should submit applications for amendment as soon as possible to give the NWB sufficient time to go through the amendment process. The process and timing may vary depending on the scope of the amendment, however a minimum of sixty (60) days is required from time of acceptance by the NWB.

Signage

Recommendations regarding signage were received from EC and GN-DOE noting that signage at the Solid Waste Disposal Facility, the Sewage Disposal Facility and the Vegetated Filter Strip Wetland Area were required. The Board agrees with parties' recommendations and is requiring as a condition in Part B Item 7 of the licence renewal, that the Licensee post signs in the

appropriate areas to inform the public of the location of Water Supply Facilities and Waste Disposal Facilities and that all signs be in English and Inuktitut.

In addition, the Board is continuing to require that signage be posted to identify Monitoring Program station locations.

Monitoring

The Board has revised the Monitoring Program requirements in this Licence renewal to reflect the changes to compliance monitoring for the Sewage Disposal Facility.

Specific changes include the removal of acute toxicity as a parameter to be monitored. In addition, the Monitoring Program no longer requires compliance monitoring at the end of the wetland, but maintains the requirement for water quality monitoring at that station to determine the performance of the wetland as a secondary treatment system.

Due to concerns regarding the effectiveness of wetland treatment, the Board has added a condition in Part H Item 16 of the License renewal, requiring the Licensee provide an indication of wastewater treatment levels upstream and downstream of the Vegetated Filter Strip Wetland Area in the annual report.

Within Amendment No.1, the Board had decided to impose additional thermal monitoring within the lagoon liner key trench and that the vertical thermistors and casings extend at least 5 metres below the base of the berm (ie below existing ground level).

In maintaining consistency with the previous licence and amendment issued, the Board has retained the condition, Part F, Item 5, to ensure that the additional thermistor stations are installed within the Key Trench of the Enhanced Sewage Disposal Facility berms and monitoring takes place. Additionally, the Board has retained the requirement for settlement monitoring of the lagoon berms. This monitoring data will be essential to the assessment of the geotechnical and geothermal performance of the lagoons following construction, as required in Part H Item 12.

LICENCE 3BM-CLY0909

Pursuant to the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada*, the Nunavut Water Board, hereinafter referred to as the Board, hereby grants to

THE HAMLET OF CLYDE RIVER

(Licensee)
of
BOX 89, CLYDE RIVER, NUNAVUT X0A 0E0

(Mailing Address)

hereinafter called the Licensee, the right to alter, divert or otherwise use water or dispose of waste for a period subject to restrictions and conditions contained within this Licence:

Licence Number **3BM-CLY0909**

Water Management Area **NUNAVUT 05**

Location **CLYDE RIVER, QIKIQTANI REGION, NU
(Latitude 70°27'N and Longitude 68°33'W)**

Purpose **WATER USE AND WASTE DISPOSAL**

Description **MUNICIPAL UNDERTAKINGS**

Quantity of Water Not to Exceed **~~30,000~~ 38,000 CUBIC METRES ANNUALLY**

Date of Licence **MARCH 18, 2009**

Expiry Date of Licence **NOVEMBER 13, 2009**

Dated this 18th of March, 2009 at Gjoa Haven, NU.



Thomas Kabloona
Nunavut Water Board
Chair

PART A: SCOPE AND DEFINITIONS

1. Scope

- a. This Licence allows for the use of water and the disposal of waste for a municipal undertaking at the Hamlet of Clyde River, Qikiqtani Region, Nunavut (70°27' N; 68°33'W);
- b. This Licence is issued subject to the conditions contained herein with respect to the taking of water and the depositing of waste of any type in any waters or in any place under any conditions where such waste or any other waste that results from the deposits of such waste may enter any waters. Whenever new Regulations are made or existing Regulations are amended by the Governor in Council under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*, or other statutes imposing more stringent conditions relating to the quantity or type of waste that may be so deposited or under which any such waste may be so deposited, this Licence shall be deemed, upon promulgation of such Regulations, to be subject to such requirements; and
- c. Compliance with the terms and conditions of this Licence does not absolve the Licensee from responsibility for compliance with the requirements of all applicable Federal, Territorial and Municipal legislation.

2. Definitions

In this Licence: **3BM-CLY0909**

“**Act**” means the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*;

“**Amendment**” means a change to original terms and conditions of this Licence requiring correction, addition or deletion of specific terms and conditions of the Licence; modifications inconsistent with the terms of the set terms and conditions of the Licence;

“**Analyst**” means an Analyst designated by the Minister under Section 85 (1) of the Act;

“**Application for Water Licence Amendment**” means the application filed by the Hamlet of Clyde River and GN-CGS with the NWB on March 10th, 2008 including supporting documents.

“**Appurtenant undertaking**” means an undertaking in relation to which a use of waters or a deposit of waste is permitted by a licence issued by the Board;

“Average Concentration for Fecal Coliforms” means the geometric mean of the last four consecutive analytical results for fecal coliforms contained in composite or grab samples collected from the Sewage Disposal Facility’s and Enhanced Sewage Disposal Facility’s Final Discharge Point.

“Board” means the Nunavut Water Board established under the *Nunavut Land Claims Agreement*;

“Chief Administrative Officer” means the Executive Director of the Nunavut Water Board;

“Effluent” means treated or untreated liquid waste material that is discharged into the environment from a structure such as a settling pond or a treatment plant;

“Engineer” means a professional engineer registered to practice in Nunavut in accordance with the *Engineering, Geological and Geophysical Act (Nunavut)* S.N.W.T. 1998, c.38, s.5;

“Enhanced Sewage Disposal Facility” comprises the area and engineered sewage lagoons, decant structures, and Vegetated Filter Strip Wetland Area designed to contain and treat sewage as described in the Application for Water Licence Amendment filed by the Applicant on March 10, 2008 and illustrated in Drawings SP-1, CSM-1, SP-2, SEC-1, TD-1, DE-1, and DE-2 prepared by Trow Associates Inc., project no. 0TCD00019055A, dated August 30, 2007;

“Final Discharge Point” in respect of an effluent means an identifiable discharge point of a facility beyond which the operator of the facility no longer exercises control over the quality of the effluent;

“Freeboard” means the vertical distance between water line and crest on a dam or dyke’s upstream slope;

“Geotechnical Engineer” means a professional engineer registered with the Association of Professional Engineers, Geologist and Geophysicists of Nunavut and whose principal field of specialization with the engineering properties of earth materials in dealing with man-made structures and earthworks that will be built on a site. These can include shallow and deep foundations, retaining walls, dams, and embankments;

“Greywater” means all liquid wastes from showers, baths, sinks, kitchens and domestic washing facilities, but does not include toilet wastes;

“Inspector” means an Inspector designated by the Minister under Section 85 (1) of the Act;

“Licensee” means the holder of this Licence;

“Modification” means an alteration to a physical work that introduces new structure or eliminates an existing structure and does not alter the purpose or function of the work, but does not include an expansion, and changes to the operating system that are consistent with the terms of this Licence and do not require amendment;

“Monitoring Program” means a monitoring program established to collect data on surface water and groundwater quality to assess impacts to the freshwater aquatic environment of an appurtenant undertaking;

“Nunavut Land Claims Agreement” (NLCA) means the *“Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada”*, including its preamble and schedules, and any amendments to that agreement made pursuant to it;

“Sewage” means all toilet wastes and greywater;

“Sewage Disposal Facility” comprises the area and engineered lagoon and decant structures designed to contain and treat sewage as described in the Application for Water Licence filed by the Applicant on February 5th, 2003 and illustrated in Drawing No. 2002-1000-050;

“Solid Waste Disposal Facility” comprises the area and associated structures designed to contain solid waste as described in the Application for Water Licence filed by the Applicant on February 5, 2003 and illustrated in Drawing No. 2002-1000-050;

“Toilet Wastes” means all human excreta and associated products, but does not include greywater;

“Waste” means, as defined in S.4 of the Act, any substance that, by itself or in combination with other substances found in water, would have the effect of altering the quality of any water to which the substance is added to an extent that is detrimental to its use by people or by any animal, fish or plant, or any water that would have that effect because of the quantity or concentration of the substances contained in it or because it has been treated or changed, by heat or other means;

“Waste Disposal Facilities” means all facilities designated for the disposal of waste, and includes the Sewage Disposal Facility, the Enhanced Sewage Disposal Facility, the Solid Waste Disposal Facility, and Bagged Toilet Waste Disposal Facility, as described in the Application for Water Licence filed by the Applicant on February 5, 2003 and illustrated

in Drawings No. 2002-1000-050, and as described in the Application for Water Licence Amendment filed by the Applicant on March 10, 2008;

“Water Supply Facilities” comprises the area and associated intake infrastructure at Water Source Lake, as described in the Application for Water Licence filed by the Applicant on February 5, 2003 and illustrated in Drawing No. 2002-1000-050; and

“Vegetated Filter Strip Wetland Area” comprises approximately 23.5 hectares of land immediately downstream of the sewage lagoon, for approximately 720 metres at a slope of 6 to 7% and includes the lagoon dewatering pump and infrastructure as well as diversion berm and fencing as described in the Application for Water Licence filed by the Applicant on March 10, 2008 and illustrated in Construction Drawings prepared by Trow Associates Inc. Project OTCD00019055A dated August 2007.

3. Enforcement

- a. Failure to comply with this Licence will be a violation of the Act, subjecting the Licensee to the enforcement measures and the penalties provided for in the Act;
- b. All inspection and enforcement services regarding this Licence will be provided by Inspectors appointed under the Act;
- c. For the purpose of enforcing this Licence and with respect to the use of water and deposit or discharge of waste by the Licensee, Inspectors appointed under the Act, hold all powers, privileges and protections that are conferred upon them by the Act or by other applicable law; and
- d. The Licensee shall, in relation to any application to renew or amend the Licence, have in place a Plan for Compliance approved by the Board in writing, to achieve full compliance with the conditions of this Licence, or a Plan for Compliance must be submitted at the time of Application, in order for the Application to be deemed complete.

PART B: GENERAL CONDITIONS

1. The Licensee shall submit to the Board for review, within thirty (30) days of Licence 3BM-CLY0909 issuance, all available data generated under licence NWB3CLY0308 and subsequent amendment “Monitoring Program”.
2. The Licensee shall file an Annual Report with the Board, no later than March 31st of the year following the calendar year reported, which shall contain the following information:

- a. tabular summaries of all data generated under the “Monitoring Program”, including an interpretation and discussion of wastewater treatment levels of the Sewage Disposal Facilities and/or the Enhanced Sewage Disposal Facilities, as well as the treatment efficiency of the Vegetated Filter Strip Wetland Area;
- b. modifications to the “Monitoring Program” in accordance with Part H Item 17;
- c. the annual quantity of sludge removed from the Sewage Disposal Facility and the Enhanced Sewage Disposal Facility along with the treatment/storage/disposal provided, as required in Part H Item 6;
- d. the results of sampling and analyses of sewage sludge in accordance with the Operations and Maintenance Manual referred to in Part F Item 2, as required in Part H Item 8;
- e. An assessment of the geotechnical and geothermal performance of the Enhanced Sewage Disposal Facility including an analyses of the results from the thermistor, standpipe and settlement monitoring stations, as required in Part H Item 12;
- f. the monthly and annual quantities in cubic metres of fresh water obtained from all sources;
- g. the monthly and annual quantities in cubic metres of each and all waste discharged;
- h. a summary of modifications and/or major maintenance work carried out on the Water Supply and Waste Disposal Facilities, including all associated structures and facilities;
- i. a list of unauthorized discharges and summary of follow-up action taken;
- j. any updates or revisions for manuals and plans (i.e., Operations and Maintenance Manual) as required by changes in operation and/or technology;
- k. detailed minutes of any public consultation and participation with local organizations and the residents of the community regarding licence amendments;
- l. a summary of any abandonment, restoration and closure work completed during the year and an outline of any work anticipated for the following year;
- m. a summary of any studies, reports, and plans (e.g., Operations and Maintenance, Abandonment, Restoration and Closure, QA/QC) requested by the Board that relate to waste disposal, water use or reclamation, and a brief description of any

future studies planned; and

- n. any other details on water use or waste disposal requested by the Board by November 1st of the year being reported.
3. The Licensee shall comply with the “Monitoring Program” described in this Licence, and any amendments to the “Monitoring Program” as may be made from time to time, pursuant to the conditions of this Licence.
4. The “Monitoring Program” and compliance dates specified in the Licence may be modified at the discretion of the Board.
5. Meters, devices or other such methods used for measuring the volumes of water used and waste discharged shall be installed, operated and maintained by the Licensee.
6. The Licensee shall, within ninety (90) days after the first visit by the Inspector following issuance of this Licence, post the necessary signs to identify the stations of the “Monitoring Program”. All signage postings shall be in the Official Languages of Nunavut.
7. The Licensee shall post signs in the appropriate areas to inform the public of the locations of the Water Supply Facility and the Waste Disposal Facilities. All signage postings shall be in the Official Languages of Nunavut.
8. The Licensee shall immediately report to the 24-Hour Spill Report Line (867-920-8130) any spills of Waste, which are reported to, or observed by the Licensee, within the municipal boundaries or in the areas of the Water Supply or Waste Disposal Facilities.
9. The Licensee shall ensure a copy of this Licence is maintained at the Municipal Office at all times. Any communication with respect to this Licence shall be made in writing to the attention of:

(a) Manager of Licensing:

Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0
Telephone: (867) 360-6338
Fax: (867) 360-6369
Email: licensing@nunavutwaterboard.org

(b) Inspector Contact:

Water Resources Officer
Nunavut District, Nunavut Region

P.O. Box 100
Iqaluit, NU X0A 0H0
Telephone: (867) 975-4295
Fax: (867) 979-6445

10. The Licensee shall submit one paper copy and one electronic copy of all reports, studies, and plans to the Board. Reports or studies submitted to the Board by the Licensee shall include a detailed executive summary in Inuktitut.
11. The Licensee shall ensure that all document(s) and correspondence submitted by the Licensee, to the Board, are received and acknowledged by the Manager of Licensing.
12. The Licensee shall submit to the Board for approval, within **thirty (30) days** of issuance of this Licence, 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 Licence, including the issues raised during the public review of the application and those of the Inspector's Reports.
13. The Licensee shall, for all Plans, Manuals and Reports submitted under this Licence, include a proposed timetable for implementation. Plans, Manuals and Reports submitted, cannot be undertaken without subsequent written Board approval and direction. The Board may alter or modify a Plan, Manual or Report if necessary to achieve the legislative objectives and will notify the Licensee in writing of acceptance, rejection or alteration of the Plan.
14. The Licensee shall, for all Plans, Manuals and Reports submitted under this Licence, implement the Plan, Manual and Report as approved by the Board in writing.
15. Every Plan to be carried out pursuant to the terms and conditions of this Licence shall become a part of this Licence, and any additional terms and condition imposed upon approval of a Plan by the Board become part of this Licence. All terms and conditions of the Licence should be contemplated in the development of a Plan where appropriate.
16. This Licence is not assignable except as provided in Section 44 of the Act.

PART C: CONDITIONS APPLYING TO WATER USE

1. The Licensee shall obtain all fresh water from Water Source Lake using the Water Supply Facilities or as otherwise approved by the Board in writing.
2. The annual quantity of water, used for all purposes, shall not exceed thirty eight thousand (38,000) cubic metres.

3. The Licensee shall maintain the Water Supply Facilities to the satisfaction of the Inspector.
4. The Licensee shall equip all water intake hoses with a screen of appropriate mesh size to ensure that fish are not entrained and shall withdrawl water at a rate such that fish do not become impinged on the screen.
5. The Licensee shall not remove any material from below the ordinary high water mark of any water body unless otherwise approved by the Board in writing.
6. The Licensee shall not cause erosion to the banks of any body of water and shall provide necessary controls to prevent such erosion.

PART D: CONDITIONS APPLYING TO WASTE DISPOSAL

1. 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.
2. All Effluent discharged from the Sewage Disposal Facility at Monitoring Program Station CLY-4 and from the Enhanced Sewage Disposal Facility at Monitoring Program Station CLY-5 shall not exceed the following effluent quality standards:

Parameter	Maximum Concentration of Any Grab Sample (mg/L)
BOD ₅	120 mg/L
Total Suspended Solids	180 mg/L
Fecal Coliforms	1 x 10 ⁶ CFU/100mL
Oil and grease	No visible sheen
pH	between 6 and 9

3. A Freeboard limit of 1.0 metre, or as recommended by a qualified geotechnical engineer and as approved by the Board in writing, shall be maintained at all dams, dykes or structures intended to contain, withhold, divert, or retain water or wastes.
4. The Licensee shall provide at least ten (10) days notification to an Inspector, prior to initiating the release of effluent from the Waste Disposal Facilities.
5. The Sewage Disposal Facility and the Enhanced Sewage Disposal Facility shall be maintained and operated, in such a manner as to prevent structural failure.

6. The Licensee shall dispose of and permanently contain all Solid Wastes at the Solid Waste Disposal Facility or as otherwise approved by the Board in writing.
7. The Licensee shall segregate and store all hazardous materials and/or hazardous waste, including waste oil, within the Solid Waste Disposal Facility in a manner as to prevent the deposit of deleterious substances into any water, until such a time as proper disposal arrangements are made.

PART E: CONDITIONS APPLYING TO MODIFICATION AND CONSTRUCTION

1. The Licensee shall implement the recommended options identified in the Water Licence Application document entitled “*Design Brief New Sewage Lagoon and Rehabilitation of Existing Sewage Lagoon for the Hamlet of Clyde River*” dated February 2008 and prepared by Trow Associates Inc. In the event of a conflict between the conditions of this Licence and the above referenced document, the conditions of this License shall prevail.
2. The Licensee shall submit to the Board for approval, design drawings stamped and signed by a qualified engineer registered in Nunavut, six (6) months prior to the construction of any dams, dykes or structures intended to contain, withhold, divert or retain water or wastes.
3. The Licensee may, without written approval from the Board, carry out modifications to the Water Supply and Waste Disposal Facilities provided that such modifications are consistent with the terms of this Licence and the following requirements are met:
 - a. the Licensee has notified the Board in writing of such proposed modifications at least sixty (60) days prior to beginning the modifications;
 - b. these modifications do not place the Licensee in contravention of the Licence or the Act;
 - c. the Board has not, during the sixty (60) days following notification of the proposed modifications, informed the Licensee that review of the proposal will require more than sixty (60) days; and
 - d. the Board has not rejected the proposed modifications.
4. Modifications for which all of the conditions referred to in Part E, Item 3, have not been met, may only be carried out upon written approval from the Board. The Licensee shall provide as-built plans and drawings of the Modifications referred to in this Licence

within ninety (90) days of completion of the Modification. These plans and drawings shall be stamped by an Engineer.

5. All activities shall be conducted in such a way as to minimize impacts on surface drainage and the Licensee shall immediately undertake any corrective measures in the event of any impacts on surface drainage.
6. The Licensee shall ensure that sediment and erosion control measures are implemented prior to and maintained during activities carried out under this Part to prevent the release of sediment and minimize erosion.
7. The construction or disturbance of any stream/lake bed or banks of any definable water course are not permitted, unless authorized by the Board in writing.

PART F: CONDITIONS APPLYING TO OPERATION AND MAINTENANCE

1. The Licensee shall submit to the Board for approval in writing, within sixty (60) days of issuance of this Licence, an Operation and Maintenance Manual (O&M 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 specifically address issues which were identified in the August 21, 2001 DIAND Inspection Report, with respect to the operations and facility capacity at the Sewage Disposal Facility and include the following Plans:
 - a. *Water Supply Facility Operation and Maintenance Plan;*
 - b. *Sewage and Solid Waste Operation and Maintenance Plan;*
 - c. *Hazardous Waste Management Plan;*
 - d. *Sludge Management Procedures;*
 - e. *Spill Contingency Plan, including updated Spill Response Plan for Aggregate Deposits; and*
 - f. *Monitoring Program Quality Assurance/Quality Control Plan (QA/QC Plan)*
2. The Licensee shall submit to the Board for approval, a minimum of ninety (90) days prior to commissioning of the Enhanced Sewage Disposal Facility, a revision to the Operations and Maintenance (O&M) Manual referred to in Part F Item 1. The Manual shall take into consideration the new facility and comments received during the application review.
3. The Licensee shall review the O&M Manual referred to in Part F, Item 1 and Item 2 as required by changes in operation and/or technology and modify accordingly. Revisions are to be submitted in the form of an Addendum to be included with the Annual Report.

4. If, during the period of this Licence, an unauthorized discharge of waste occurs, or if such a discharge is foreseeable, the Licensee shall:
 - a. employ the appropriate contingency measures as approved under the Operation and Maintenance Manual for the Hamlet of Clyde River;
 - b. report the incident immediately via the 24-Hour Spill Reporting Line at (867) 920-8130, to the Inspector at (867) 975-4295, and to the Government of Nunavut Department of Environment at (867) 975-7700; and
 - c. submit to the Inspector, a detailed report on each occurrence, not later than thirty (30) days after initially reporting the event, that provides the necessary information on the location (including the GPS coordinates), initial response action, remediation/clean-up, status of response (ongoing, complete), proposed disposal options for dealing with contaminated materials and any preventative measures to be implemented.
5. The Licensee shall, prior to commissioning of the Enhanced Sewage Disposal Facility, install thermistors, monitoring standpipes and settlement monitoring stations as described in the application documents, dated March 10, 2008. In addition, thermistors are to be installed within the key trench corresponding to each station of vertical thermistor installation, for the determination of permafrost development around the key trench and confirmation of design criteria with respect to the reliability of permafrost as an engineered system for seepage control.
6. The Licensee shall submit to the Board, prior to commencing construction or procurement of construction materials from the quarry, a revised final Spill Response Plan Aggregate Deposits, Clyde River, Nunavut, prepared by Trow Associates Inc., dated November 2008, Project no. OTCD00019055A, that specifically addresses the quarry site operations and existing facilities and takes into consideration issues raised by parties during the review process. This Plan is to be incorporated into the O&M Manual, Part F, Item 1, as an addendum upon approval by the Board in writing.
7. The Licensee shall maintain an undisturbed buffer zone of at least 100 metres between any proposed quarry operation and the normal high water mark of any water body.
8. An inspection of all engineered facilities related to the management of water and waste shall be carried out annually in July or August by a Geotechnical Engineer. The engineer's report shall be submitted to the Board within sixty (60) days of the inspection, including a covering letter from the Licensee outlining an implementation plan addressing each of the Engineer's recommendations.
9. The Licensee shall perform more frequent inspections of the engineered facilities at the request of an Inspector.

10. The Licensee shall ensure that sediment and erosion control measures are implemented prior to and maintained during activities carried out under this Part to prevent the release of sediment and minimize erosion.

PART G: CONDITIONS APPLYING TO ABANDONMENT, RESTORATION AND CLOSURE

1. The Licensee shall submit to the Board for approval, an *Abandonment, Restoration and Closure Plan*, at least six (6) months prior to a) abandoning of any facilities and b) the construction of new facilities to replace existing ones. Where applicable, the Plan shall include information on the following:
 - a. solid waste disposal facility;
 - b. water intake facilities;
 - c. the water treatment and waste disposal sites and facilities;
 - d. petroleum and chemical storage areas;
 - e. any site affected by waste spills;
 - f. leachate prevention;
 - g. an implementation schedule;
 - h. maps delineating all disturbed areas, and site facilities;
 - i. consideration of altered drainage patterns;
 - j. type and source of cover materials;
 - k. future area use;
 - l. hazardous wastes; and
 - m. a proposal identifying measures by which restoration costs will be financed by the Licensee upon abandonment.
2. For site reclamation purposes, the Licensee shall salvage top soil for future restoration of the site to promote re-vegetation.
3. The Licensee shall practice progressive reclamation of the quarry development in accordance with the restoration guidelines outlined in Indian and Northern Affairs Canada's document entitled *Environmental Guidelines for Pits and Quarries*, 1982.
4. The Licensee shall complete the restoration work within the time schedule specified in the Plan, or as subsequently revised and approved by the Board.

PART H: CONDITIONS APPLYING TO THE MONITORING PROGRAM

1. The Licensee shall maintain Monitoring Program Stations and implement the Program as described in Schedule I attached to this Licence and conditions under this Part.

2. The Licensee shall confirm the locations and GPS coordinates for all monitoring stations referred to in Part H Item 1, and Schedule I with an Inspector.
3. The Licensee shall sample water quality at Monitoring Program Stations CLY-4, CLY-5, CLY-6a, CLY-6b and CLY-7 a minimum of three (3) times annually, to include once upon commencement, once approximately mid-way through discharge, and once prior to discharge ending. Samples shall be analyzed for the following parameters:

Biochemical Oxygen Demand – BOD ₅	Fecal Coliforms
Total Suspended Solids	pH
Conductivity	Nitrate-Nitrite
Oil and Grease (visual)	
Magnesium	Calcium
Sodium	Potassium
Chloride	Sulphate
Total Hardness	Total Alkalinity
Ammonia Nitrogen	Total Zinc
Total Cadmium	Total Iron
Total Cobalt	Total Manganese
Total Chromium	Total Nickel
Total Copper	Total Lead
Total Aluminum	Total Arsenic
Total Mercury	Total Organic Carbon (TOC)

4. If the discharge at Station CLY-4 or CLY-5 has been suspended and subsequently restarted with more than a 48 hour lapse, the sampling sequence described in Part H, Item 3 of the Monitoring Program shall be repeated.
5. The Licensee shall measure and record in cubic metres, the monthly and annual quantities of water pumped from Monitoring Program Station CLY-1 for all purposes and effluent pumped or discharged from Monitoring Program Stations CLY-4 and CLY-5.
6. The Licensee shall measure and record the annual quantities of sludge removed from the Sewage Disposal Facility and the Enhanced Sewage Disposal Facility, along with the methods of treatment, storage, and disposal provided.
7. The Licensee shall sample water quality at Monitoring Stations CLY-2 and CLY-13 once at the beginning, middle and near the end of the season during observed flow. Samples shall be analyzed for the parameters listed in Part H Item 3 as well as Total Petroleum Hydrocarbons.

8. The Licensee shall sample and analyze sludge in accordance with the approved Operations and Maintenance Plan referred to in Part F Item (d).
9. The Licensee shall monitor annually in early to mid fall, prior to freezing, for the presence of seepage within standpipes at Monitoring Station(s) CLY-11. If seepage is observed, the licensee shall sample and analyze the seepage for the parameters listed in Part H Item 3.
10. The Licensee shall monitor temperature at Monitoring Station(s) CLY-9 and CLY-10, a minimum of once every two months for the first two years following construction of the Enhanced Sewage Disposal Facility, and twice annually thereafter, in early spring and mid to late fall.
11. The Licensee shall monitor settlement and displacement annually at Monitoring Station(s) CLY-12.
12. The Licensee shall provide the monitoring results for thermistor, standpipe, and settlement stations at Monitoring Stations CLY-9, CLY-10, CLY-11, and CLY-12 semi-annually, due no later than July 31 and January 31 of each year, for the first two years of monitoring. An annual assessment of the geotechnical and geothermal performance of the Enhanced Sewage Disposal Facility shall be provided as an addendum to the Annual Report.
13. The Licensee shall submit to the Board upon approval by an analyst, for inclusion with the O&M Manual, required under Part F, Item 1(f), a Quality Assurance/Quality Control (QA/QC) Plan. The Plan shall include up to date sampling methods to all applicable standards, acceptable to an accredited laboratory as required by Part H, Item 14 and Part H, Item 15. The Plan shall include a covering letter from the accredited laboratory and analyst, confirming acceptance of the Plan for analyses to be performed under this Licence.
14. All sampling, sample preservation and analyses shall be conducted in accordance with methods prescribed in the current edition of *Standard Methods for the Examination of Water and Wastewater*, or as approved by the Board in writing.
15. All analyses shall be performed in a laboratory accredited according to ISO/IEC Standard 17025. The accreditation shall be current and in good standing.
16. The Licensee shall include all of the data and information required by the Monitoring Program as well as an indication of wastewater treatment levels upstream and downstream of the Vegetate Filter Strip Wetland Area in the Licensee's annual report, as required *per* Part B, Item 2, or as requested by an Inspector.

17. Modifications to the Monitoring Program may be made only upon written approval from the Board. Requests for changes to the Monitoring Program should be forwarded to the NWB in writing, and should include the justification and appropriate evidence to support the change
18. Additional sampling and analysis may be requested by an Inspector.

SCHEDULE I
WATER LICENCE NO. 3BM-CLY0909

Monitoring	Description	Frequency	Status
CLY-1	Raw water supply intake at Water Source Lake	<u>Volume:</u> Monthly and Annually	Active (Volume)
CLY-2	Runoff from the Solid Waste Disposal Facilities	Once at the beginning, middle and near the end of the season during observed flow/seepage	Active (Water Quality)
CLY-3a	Raw sewage at truck offload point (existing cell)	<u>Volume:</u> Monthly and Annually	Not Active (Volume)
CLY-3b	Raw sewage at truck offload point (new cell)	<u>Volume:</u> Monthly and Annually	Not Active - New (Volume)
CLY-4	Effluent discharge from existing Sewage Disposal Facility	<u>Volume:</u> Monthly and Annually <u>Water Quality:</u> Three times annually (as per Part H, Item 3);	Active (Volume and Water Quality)
CLY-5	Effluent discharge from Enhanced Sewage Disposal Facility (Lagoon decanting point)	Same as CLY-4	New (Volume, Water Quality)
CLY-6a	Sampling well at the end of Vegetated Filter Strip Wetland at location shown on drawing CSM-1	<u>Water Quality:</u> Three times annually (as per Part H, Item 3);	New (Water Quality)
CLY-6b	Surface water at the end of the Vegetated Filter Strip Wetland in vicinity of CLY-6a	<u>Water Quality:</u> Three times annually (as per Part H, Item 3);	New (Water Quality)
CLY-7	Water five (5) metres from the point where Effluent enters Patricia Bay	<u>Water Quality:</u> Three times annually (as per Part H, Item 3);	New (Water Quality)
CLY-8	Sewage sludge	To be determined in accordance with Part F Item 2(c) and Part H Items 10 and 15	New (Volume and Quality)

Monitoring	Description	Frequency	Status
CLY-9	All thermistors at locations shown in drawing SP-2 of the Application for Water Licence Amendment (casings to extend 5 m below the base of the berm)	<u>Temperature:</u> Minimum once every two months for the first two years following construction, then twice annually (early spring and mid to late fall) thereafter	New (Temperature)
CLY-10	All single-bead thermistors placed below the liner and into key trench at locations adjacent to those defined in CLY-9	Same as CLY-9	New (Temperature)
CLY-11	All standpipes at locations shown in drawing SP-2 of the Application for Water Licence Amendment	<u>Seepage:</u> Annually early to mid fall <u>Water Quality:</u> When seepage is observed	New (Seepage and Water Quality)
CLY-12	All settlement stations at locations adjacent to thermistors shown in drawing SP-2 of the Application for Water Licence Amendment	<u>Settlement:</u> Annually	New (location, elevation)
CLY-13	Runoff from the quarry site	Once at the beginning, middle and near the end of the season during observed flow	New (Water Quality)