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NUNAVUT IMALIRIYIN KATIMAYINGI
NUNAVUT WATER BOARD
OFFICE DES EAUX DU NUNAVUT

WATER LICENCE APPLICATION FORM

Application for: (check one)

☐ New
 ☐ Renewal
 ☒ Amendment
 ☐ Assignment
 ☐ Cancellation

LICENCE NO:
(for NWB use only)

1. NAME AND MAILING ADDRESS OF APPLICANT/LICENSEE

Akeego Ikkidluak
Acting SAO, Hamlet of Kimmirut, Baffin Region.
Box # 120, X0A 0N0, NU.
Ph: 867 939 2247, Fax: 867 939 2045
Contact Person:
Bhabesh Roy, M.A.Sc., P.Eng.
Municipal Planning Engineer, GN-CGS

Phone: 867 7 899 7314
Fax: 867 899 7328
e-mail: broy@gov.nu.ca

2. ADDRESS OF CORPORATE OFFICE IN CANADA (if applicable)

Akeego Ikkidluak
Acting SAO, Hamlet of Kimmirut, Baffin Region.
Box # 120, X0A 0N0, NU.
Ph: 867 939 2247, Fax: 867 939 2045
Contact Person:
Bhabesh Roy, M.A.Sc., P.Eng.
Municipal Planning Engineer, GN-CGS

Phone: 867 899 7314
Fax: 867 899 7328
e-mail: broy@gov.nu.ca

3. LOCATION OF UNDERTAKING (describe and attach a topographical map, indicating the main components of the Undertaking)

Latitude: (62°50'52" N) Longitude: (69°54'25" W)
NTS Map Sheet No. _____ Scale: _____

4. DESCRIPTION OF UNDERTAKING (attach plans and drawings)

5. TYPE OF PRIMARY UNDERTAKING (A supplementary questionnaire must be submitted with the application for undertakings listed in "bold")

- | | |
|---|--|
| <input type="checkbox"/> Industrial | <input type="checkbox"/> Agricultural |
| <input type="checkbox"/> Mining and Milling (includes exploration/drilling) | <input type="checkbox"/> Conservation |
| <input checked="" type="checkbox"/> Municipal (includes camps/lodges) | <input type="checkbox"/> Recreational |
| <input type="checkbox"/> Power | <input type="checkbox"/> Miscellaneous (describe below): |

See Schedule II of *Northwest Territories Waters Regulations* for Description of Undertakings

6. WATER USE

- | | |
|---|--|
| <input checked="" type="checkbox"/> To obtain water | <input type="checkbox"/> Flood control |
| <input type="checkbox"/> To cross a watercourse | <input type="checkbox"/> To divert a watercourse |
| <input type="checkbox"/> To modify the bed or bank of a watercourse | <input type="checkbox"/> To alter the flow of, or store, water |
| <input type="checkbox"/> Other (describe): Soil remediation | |

7. QUANTITY OF WATER INVOLVED (cubic metres per day including both quantity to be used and quality to be returned to source)

Water use ☒ 100m³/day or less
☐ Greater than 100m³/day; if greater, indicate quantities to be used for each purpose (camp, drilling, etc.)

Water returned to source
17.68 m³/day

8. WASTE (for each type of waste describe: composition, quantity (cubic metres per day), methods of treatment and disposal, etc.)

- | | |
|--|---|
| <input checked="" type="checkbox"/> Sewage | <input type="checkbox"/> Waste oil |
| <input checked="" type="checkbox"/> Solid Waste | <input type="checkbox"/> Greywater |
| <input type="checkbox"/> Hazardous | <input type="checkbox"/> Sludges |
| <input type="checkbox"/> Bulky Items/Scrap Metal | <input type="checkbox"/> Other describe): |
- Solidwaste by Land fill, and sewage by wetland

9. OTHER PERSONS OR PROPERTIES AFFECTED BY THIS UNDERTAKING (give name, mailing address and location; attach if necessary)**Land Use Permit**

DIAND ☐ Yes ☐ No If no, date expected _____

Regional Inuit Association ☐ Yes ☐ No If no, date expected _____

Commissioner ☒ Yes ☐ No If no, date expected _____

10. PREDICTED ENVIRONMENTAL IMPACTS OF UNDERTAKING AND PROPOSED MITIGATION MEASURES (direct, indirect, cumulative impacts, etc.)

NIRB Screening ☐ Yes ☒ No If no, date expected N/A

11. INUIT WATER RIGHTS

Will the project or activity substantially affect the quality, quantity, or flow of water flowing through Inuit Owned Lands and the rights of Inuit under Article 20 of the Nunavut Land Claims Agreement?

If yes, has the applicant entered into an agreement with the Designated Inuit organization to pay compensation for any loss or damage that may be caused by the alteration. If no compensation agreement

has been made, how will compensation be determined?
Not applicable

12. **CONTRACTORS AND SUB-CONTRACTORS** (name, address and functions)

13. **STUDIES UNDERTAKEN TO DATE** (list and attach copies of studies, reports, research, etc.)

Trow's compliance report will be attached.

14. **THE FOLLOWING DOCUMENTS MUST BE INCLUDED WITH THE APPLICATION FOR THE REGULATORY PROCESS TO BEGIN**

Supplementary Questionnaire (where applicable: see section 5) ☐ Yes ☐ No If no, date expected _____

Inuktitut and/or Inuinnaqtun/English Summary of Project ☐ Yes ☐ No If no, date expected _____

Application fee of \$30.00 (Payee Receiver General for Canada) ☒ Yes ☐ No If no, date expected _____

Water Use fee of \$30.00 (unless otherwise indicated in Section 9 of the *NWT Waters Regulations*; Payee Receiver General for Canada)

☐ Yes ☐ No If no, date expected _____

15. **PROPOSED TIME SCHEDULE** (unless otherwise indicated, the NWB will consider the application for a five (5) year term)

☐ one year or less (or) ☒ Multi Year

Start Date: January 9, 2009 Completion Date: January 9, 2013

Akeego Ikkidluak
Name (Print)

Acting SAO
Title (Print)

A. Ikkidluak
Signature

April 1, 2009
Date

For Nunavut Water Board office use only

APPLICATION FEE Amount: \$ 30.00 Pay ID No.: _____

WATER USE DEPOSIT Amount: \$ _____ Pay ID No.: _____

Roy, Bhabesh

From: David Hohnstein [dts@nunavutwaterboard.org]
Sent: Thursday, April 09, 2009 2:07 PM
To: Roy, Bhabesh
Cc: Tunaley, Karlette; Stephen Lines
Subject: Telephone call

Hi,
 Dionne just stopped in so I'll be out for lunch, should be back by about 1:30pm MDT, 3:30 ET.

Sorry for the inconvenience.

Dave



David Hohnstein, C.E.T.,
 A/Director Technical Services

Nunavut Water Board | ᑎᓄᓂᓂᓂ ᑕᓄᓂᓂᓂ ᑕᓄᓂᓂᓂ NUNAVUT IMALIRIYIN KATIMAYINGI Office Des Eaux Du Nunavut
 P.O. Box 119 Gjoa Haven, NU X0B 1J0 Tel. 867.360.6338 Fax. 867.360.6369

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 Email: dts@nunavutwaterboard.org The Nunavut Water Board website is available at: www.nunavutwaterboard.org

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5/30/2009

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Roy, Bhabesh

From: Karlette Tunaley [ktunaley@envireview.ca]
Sent: Thursday, April 09, 2009 6:21 PM
To: Roy, Bhabesh
Cc: dts@nunavutwaterboard.org; 'Dionne Filiatrault'
Subject: Kimmirut Amendment Application

Hi Bhabesh

It was good talking with you earlier today. To follow up, I have put together a list of items to submit for the application for amendment to the Hamlet of Kimmirut's water licence 3BM-KIM0911:

1. Cover letter with request for amendment including proposed effluent quality limits, discharge strategy, and monitoring plan;
2. Completed amendment application form (attached);
3. Application fee \$30.00;
4. Executive summary in English;
5. Executive summary translated;
6. Plan for Compliance in accordance with Part B Item 11 of the licence that addresses all licensed components and issues raised by the Inspector including but limited to:
 - a. Sewage disposal
 - b. Solid waste disposal including the segregation of bulk metals and hazardous wastes (see Inspector report dated January 8, 2008)
 - c. Water use including the installation of a volumetric device on the water intake system (see Inspector report dated January 8, 2008)
 - d. Access road
 - e. Quarry
 - f. Monitoring including the collection and analysis of samples and the posting of signs at monitoring program stations and the submission of a Quality Assurance/ Quality Control Plan (see Inspector report dated January 8, 2008)
 - g. Submission of annual reports (see Inspector report dated January 8, 2008)
 - h. Submission of Abandonment and Restoration Plan (see Inspector report dated January 8, 2008)
 - i. Any others

The Plan for Compliance must also provide an implementation schedule (note that this Plan was due April 9, 2009);

7. Operations and Maintenance Plan in accordance with Part F Item 1 of the licence. This Plan should be separate from the Plan for Compliance. (note that this Plan was due April 9, 2009)

A complete application is required before the NWB can process the application. Once the NWB determines the application to be complete, the application will be subject to a 30 day notice period.
 I hope this guidance helps. If you have any questions please feel free to contact me.

Regards,
 Karlette

Tunaley, Lines & Associates

6/3/2009

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1011 8th St SE
Calgary, AB
T2G 2Z3
Phone/Fax 403-697-7897
Email: ktunaley@envireview.ca

**Answers to the Requirements/questions to the Hamlet of Kimmirut's
Water licence 3BM-KIM0911:**

- 1. Cover letter with request for amendment including proposed effluent quality limits, discharge strategy, and monitoring plan;**

Ans: Attach a letter of TROW indicating effluent quality limit and discharge strategy. The monitoring plan will be provided in the Sewage Lagoon O&M manual.

- 2. Completed amendment application form (attached);**

Ans. Amendment application has been signed by the SAO and attached.

- 3. Application fee \$30.00;**

Ans. Attached \$30 cheque.

- 4. Executive summary in English;**

Ans. Attached Technical Summary in English

- 5. Executive summary translated;**

Ans. Attached Technical summary in Inuktitut

- 6. Plan for Compliance in accordance with Part B Item 11 of the licence that addresses all licensed components and issues raised by the Inspector including but limited to:**

- a. Sewage disposal**

Ans. This will be shown in the O&M manual.

- b. Solid waste disposal including the segregation of bulk metals and hazardous wastes (see Inspector report dated January 8, 2008)**

Ans. A consultant is being hired to work on this project

- c. Water use including the installation of a volumetric device on the water intake system (see Inspector report dated January 8, 2008)**

Ans. Yes, the volumetric device is not working. SAO is working with an electrician to fix up the problem ASAP.

- d. Access road**

Ans. There are two access roads. One is towards Quarry deposit # 2 and another one is towards proposed Sewage Lagoon. The Quarry deposit access road has been designed and Technical specification is ready for construction tendering once funds are available.

The access road towards proposed sewage lagoon has been redesigned for rehabilitation and technical specification is ready for construction tendering once funds are available.

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e. Quarry

Ans. A quarry deposit #2 of capacity about 45000 cubic meters has been identified for construction granular material source. NIRB approval has been obtained for granular production.

f. Monitoring including the collection and analysis of samples and the posting of signs at monitoring program stations and the submission of a Quality Assurance/ Quality Control Plan (see Inspector report dated January 8, 2008)

Ans. The above information will be documented in the Sewage Lagoon final O&M manual once the facility is built. Interestingly they are also shown in clause 4.7 **Monitoring and Compliance points** in Table 4.7 and 4.8 of the Design Brief of the Sewage Lagoon.

g. Submission of annual reports (see Inspector report dated January 8, 2008)

Ans. The annual Report in 2008 is attached.

h. Submission of Abandonment and Restoration Plan (see Inspector report dated January 8, 2008)

Ans. The consultant will be working on this plan.

i. Any others

The Plan for Compliance must also provide an implementation schedule (note that this Plan was due April 9, 2009);

Ans: The Plan for compliance is as follows:

1. The Sewage Lagoon will be built once the funds are available, expecting to start construction in 2010, if the funds are available.
 2. The construction of the access road towards the Quarry site is expected to start in 2010 provided if the funds are available.
 3. The rehabilitation of the access road towards the proposed Sewage Lagoon is expected to start in 2010, again if the funds are available.
 4. The consultant will be working in the current fiscal year 2009/10 on the design of the solidwaste improvement by developing a new site and decommissioning the existing site, and also preparing O&M manual, QA/QC plan including Spill contingency plan.
- 7. Operations and Maintenance Plan in accordance with Part F Item 1 of the licence. This Plan should be separate from the Plan for Compliance. (note that this Plan was due April 9, 2009)**

Ans: The consultant will provide O&M manuals for both sewage Lagoon and Landfill site satisfying the requirements of Nunavut Water Board.



Trow Associates Inc.

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Telephone: (613) 225-9940
Facsimile: (613) 225-7337
E-mail: ottawa@trow.com
Web Site: www.trow.com

Reference: OTCD00018881A

May 11, 2009

Mr. Bhabesh Roy, M.A.Sc., P.Eng.
Municipal Planning Engineer
Community & Government Services
Baffin Region, Government of Nunavut
P.O. Box 379
Pond Inlet, NU X0A 0S0

Via Facsimile:
867-899-7328

Effluent Criteria at the Compliance Point Kimmirut Sewage Lagoon

Dear Mr. Roy:

Further to the conference call on February 3rd, 2009 regarding the Water Licence for the Kimmirut Sewage Lagoon, the following outlines our recommendations with regards to the location of the compliance point and the effluent criteria for the Kimmirut enhanced sewage treatment facility.

As per the Hamlet's of Kimmirut Water Licence 3BM-KIM0911, we proposed that the compliance point for the sewage treatment system be at the outlet of the lower lagoon, as this constitutes the last point of operator control over the facility. The rationale for the effluent criteria at the compliance point is based on the Guidelines for Discharge for Treated Municipal Waste Water in the Northwest Territories 1992, note 12 for table 4.1 which states "where wetlands are used as part of the treatment system, limits shall be chosen to suit the point of measurement and control". This point is interpreted to mean the effluent criteria shall take into consideration the additional treatment the effluent will receive in the wetlands when determining the effluent criteria at the compliance point. Therefore the effluent criteria at the compliance point will be set by determining the effluent strength allowable at the compliance point that will result in the effluent strength required at the end of the wetlands.

We have assumed an effluent criteria of 45 mg/L of BOD₅ and 45 mg/L total suspended solids (TSS) at the end of the wetlands, based reference to the similar criteria at the end of wetlands for the Cape Dorset facility during the conference call. The Kimmirut Wetlands Planning Study prepared for this project estimated a quality of effluent at the end of the wetlands of 38 mg/L BOD₅ and 39 mg/L TSS, based on an influent quality of 230 mg/L and 245 mg/L BOD₅ and TSS respectively. Assuming a proportional removal rate to achieve the 45 mg/L and 45 mg/L effluent quality criteria, the influent entering the wetlands would require a level of 272 mg/L BOD₅ and 288 mg/L TSS.

When setting effluent criteria at the end of the sewage lagoon consideration must be given to dilution through runoff. Based on the average yearly precipitation of 412 mm (as Climatic Normals are not available for Kimmirut the annual average precipitation for Iqaluit is used) the average annual precipitation which falls within the drainage area of the enhanced sewage

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disposal system is 48,108 m³. Based on a projected sewage generation rate for the year 2028 of 33,195 m³ the average dilution rate is rate of dilution of the effluent is 40.8%. This rate varies during the time of discharge between approximately 46% and 37%.

The rates of dilution above do not take into consideration the yearly variance of precipitation. In 2004, Trow undertook a study of the City of Iqaluit's raw water supply and storage, which included a review of the minimum anticipated precipitation of 5, 20 and 100 year return frequencies. The following table summarizes the estimated minimum yearly precipitation for a 5 year, 20 year and 100 year return period, and the corresponding dilution rates based on the these minimum yearly precipitation rates.

Table 1: Average Dilution Rates

Return period	Estimated Minimum Precipitation (mm)	Percentage of Average Yearly Precipitation	Average Dilution Rate
Average precipitation	412		40.8%
5 year	340	82.5%	45.5%
20 year	310	75.25%	47.8%
100 year	280	68%	50.3%

Based on the estimated required effluent quality at the end of the lagoon of 272 mg/L and 288 mg/L of BOD₅ and TSS respectively, to meet the goal of 45 mg/L BOD₅ and 45 mg/L TSS and the dilution rates listed above, the following tables summarizes the required effluent criteria which will have to be met at the compliance point, based on the average precipitation and the 5 year, 20 year and 100 year return period minimum precipitation.

Table 2: Effluent Quality for Return Periods

Return Period	Dilution	BOD ₅	TSS
Average Precipitation	41%	112 mg/L	118 mg/L
5 year	46%	125 mg/L	132 mg/L
20 year	48%	131 mg/L	138 mg/L
100 year	50%	136 mg/L	144 mg/L

We recommend the effluent criteria at the compliance point (the discharge of the Lower Lagoon) be based on a dilution factor for the minimum precipitation for a 20 year return period as the design life of the lagoon is 20 years. In recognizing the variance of runoff during the discharge period, we recommend the discharge criteria be based on the average of the three samples taken

during the discharge period. In addition, we recommend that the water licence recognize that it is statistically probable that the yearly precipitation will be less than the 20 year return period during the life of the facility, and if the sampling exceeds the criteria, a study of runoff is undertaken to determine if the dilution was not achieved. It should also be recognized that the dilution rates are based on historical data for Iqaluit.

In summary, we recommend the water licence adopt the following clauses:

1. The performance of the Enhanced Sewage Disposal System shall be monitored at the outlet of the Lower Lagoon, KIM-6 and KIM-7.
2. All Effluent discharged from the Enhanced Sewage Disposal Facility at the Monitoring Program Stations KIM-6 and KIM-7 shall not exceed the following Effluent quality limits based on an average of samples taken throughout the discharge period, put forth in the Water Licence 3BM-KIM0911:

Table 3: Effluent Discharge Criteria

Parameter	Maximum Average Concentration
BOD ₅	135 mg/L
Total Suspended Solids (TSS)	140 mg/L
Faecal Coliforms	1 x 10 ⁶ CFU/100mL
Oil and Grease	No visible sheen
pH	Between 6 and 9


3. The water licence be amended such that in the event results of the monitoring program exceeding the effluent criteria listed above, the precipitation records will be reviewed to determine the actual rate of dilution and the affect it would have on the monitoring samples.

Should you have additional questions or require additional information please do not hesitate to contact Steven Burden at 613-225-9940 ext. 257.

Yours truly,

Trow Associates Inc.


Stephen A. Douglas
Senior Designer
Infrastructure Services


Steven L. Burden, P.Eng.
Project Manager
Infrastructure Services

**Technical Report of the Environmental Facilities
Hamlet of Kimmirut**

Bhabesh Roy, M.A.Sc., P.Eng. MPE, Baffin Region, GN-CGS.

The Hamlet of Kimmirut is a small community of Baffin Region with a population of about 546. This community is located at 62°50'06''N and 69°52'04''W on the south end of Baffin Island.

In the community, there is a big and deep water lake from where water is extracted, treated in the water truck fill station and delivered by trucks to the community.

In 2001, a sewage lagoon and a landfill site including 1.5km access road were built. These facilities were never used. The community currently discharging its sewage to a ditch which drains directly to the ocean. The community wastes are dumped next to this.

The sewage lagoon and its access road have been redesigned and ready for construction tender once the capital funds are available. In order to get materials for construction, NIRB approval has been obtained for granular material production in deposit # 2 of capacity about 45,000 cubic meters. The design and tender specifications are ready of this road as well for construction and it delays due to the availability of funding.

To satisfy the requirements of the current water license, the solid waste management will need to be improved including with a proper Operation and Maintenance manual. The plan of compliances together with Quality Control and Quality Assurance (QA&AC) plan will need to be presented in a proper format. A consultant is being hired soon dealing with all these requirements. These documents will be submitted to the Water Board once ready.

The compliance effluent parameters of the sewage lagoon have been revised and submitted to the Board for acceptance. The existing Hamlet Water License is recommended to get amendment.

**ANNUAL REPORT
FOR THE MUNICIPALITY OF KIMMIRUT**

YEAR BEING REPORTED: 2008-2009 Financial Year

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water Licence No. 3BM-KIM 0911 issued to the **Municipality of Kimmirut**.

- i) - iii) tabular summaries of all data generated under the "Monitoring Program"; monthly and annual quantities in cubic metres of freshwater obtained from all sources; monthly and annual quantities in cubic metres of each and all wastes discharged;

Attached are quantities of water used as reported in our On Tap Water Delivery System and the estimated discharge of sewage waste based on quantities used.

Month Reported	Quantity of Water Obtained from all sources (litres)	Quantity of Sewage Waste Discharged
April 2008	1,341,611	Same
May 2008	1,453,137	Same
June 2008	1,400,833	Same
July 2008	1,472,153	Same
August 2008	1,501,395	Same
September 2008	1,619,446	Same
October 2008	1,661,633	Same
November 2008	1,587,999	Same
December 2008	1,676,355	Same
January 2009	1,531,108	Same
February 2009	1,468,864	Same
March 2009	1,614,761	Same
	18,329,294.72	

**ANNUAL REPORT
FOR THE MUNICIPALITY OF KIMMIRUT**

ANNUAL TOTAL		Same
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- iv. **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;**

Water Truckfill station will be power connected. Solid waste management will be improved and the existing site will be decommissioned once the new facility will be built.

- v. **a list of unauthorized discharges and summary of follow-up action taken;**

The design of the new sewage lagoon has been approved by the board.
Once this is built, the existing source will be decommissioned.

- vi. **a summary of any abandonment and restoration work completed during the year and an outline of any work anticipated for the next year;**

The design work of the solid waste site is expected to complete this year and actual construction works will be stated in next year once funds are available.

- vii. **a summary of any studies requested by the Board that relate to waste disposal, water use or reclamation, and a brief description of any future studies planned;**

NIL

- viii. **any other details on water use or waste disposal requested by the Board by November 1st of the year being reported; and;**

The Board has requested to meter the quantity of water coming from the lake.
Hamlet is aware about it and following up.

- ix. **Updates or revisions to the approved Operation and Maintenance Plans.**

The Consultant will be developing new O&M manuals for both sewage lagoon and landfill site.

ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

GN-CGS is planning to hire a consultant for the designing the improvement of Solid wastes management, developing O&M manual and QA/QC plan including Abandonment and restoration plans in this fiscal year.

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

Hamlet has prepared the 2008-09 annual report for the Board. Hamlet is also Planning putting signage in each environmental facility.