

Annual Report-2014

Water Licence: 3BM-GJO1318

Hamlet of Gjoa Haven, NU

Submitted to the Nunavut Water Board

March 30, 2015

Submitted by

Shah Alam, P. Eng.

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Department of Community and Government Services

Nunalingni Kavamatkunnilu Pivikhaqautikkut

Ministère des Services Communautaires et gouvernementaux

Annual Report 2014

March 30, 2015

Nunavut Water Board

P.O. Box 119

Gjoa Haven, NU X0B 1L0

Attention: Phyllis Beaulieu, Manager of Licensing

RE: 3BM-GJO 1318 – Annual Report 2014, Hamlet of Gjoa Haven, NU

Dear Ms. Phyllis,

The Hamlet of Gjoa Haven is pleased to submit to Nunavut Water Board the attached file of "Annual Report 2013" of water uses and sewage solid waste disposal as required and directed under the compliance of Water Licence; 3BM-GJO-1318 as stated above. Copies of required tests reports are attached herewith (Appendices) as requested for your review and reference.

With the help of Government of Nunavut through Community and Government Services, the Hamlet has undertaken a comprehensive waste management program which has led bulk waste reduction and in the improvement to waste facility. Operation of new sewage lagoon has facilitated the proper containment of raw sewage, primary remediation and effluent control on wetland and discharge. The annual monitoring program for sewage and solid waste effluent continues during July- Sep each year. Samples test result has shown excellent control on contamination parameters within allowable limit comprising BOD, TSS, E-coli and Toxicity components. We summarized those conditions and requirements outlined in Part B through part H as below:

Part B: General conditions:

Item 1.(a through i):

- Tabular Form of Annual water consumption and sewage disposal are from hamlet fluid Manager
- Quantities were measured on daily basis of water distribution and sewage disposal
- No modification to water supply, but improvement to solid waste disposal during this period
- Modification to sewage disposal program migrated to new lagoon which led the decommissioning of old sewage lagoon started in late fall and continued for next year 2015.
- Decommissioning of old lagoon started in late summer which leads to unauthorized discharge since started before an official approval received. Correction has been made as required and requested.
- An overflow dyke at 1.5 m from the lagoon berm at the decanting location of the new lagoon.
- O&M manual of new sewage was submitted to the Board and approved for implementation.
- The revised QA/QC plan is addressed in the O&M manual of new Sewage Facility which was requested in the new approved Licence. An amendment application was also submitted.



Items 2-15:

- No changes in sewage collection program, but only changes to drop off point to new lagoon at designated new location of GJO-3 mentioned in the monitoring stations.
- Monitoring stations marked with location signage. Maintenance and any missing signage will be managed by the Licensee in summer 2015.
- No device Meter was used for volume measurement, however, truck-fill measurement uses as precise in taking the volume of water, sewage and solid waste.
- Facility signage are installed at side of front entry to the facility; re-print the letter on the signage of solid waste would be required for public visibility and will be managed during the summer operation.
- No Spill or emergency occurrences happened and reported during this period, however contact information for Spill Reporting has been updated.
- No changes in Monitoring program as reported in QA/QC plan and Plan for Compliance, the only change in part of wetland diversion/extension to connect the new sewage lagoon from point of decanting. Due to short summer and early winter freeze up, no decanting carried from the new sewage lagoon during this year, plan for early decanting in next year 2015. Information and request will be sent to AANDC inspector at least 10 days ahead as stated in the guidelines of the Licence.

Part C: Water Use:

- Water drawn from the Swan Lake as the only approved source and annual quantities 44,545 cubic metres limited within the allowable annual limit of 62,000 cubic metres. However, additional quantity of water drawn through intake system to continue the flow inside the buried line and thrown outside time to time during the winter months March-April to prevent the line freezing up. Most of the thrown water frozen outside the lake and remains a part to watershed. Replacement of affected line portion will be carried in summer 2015 with a GN project which includes control monitoring, pump efficiency increase and replacement of reheating system.

Part D: Waste Disposal

- All sewage disposal carried to the new Sewage Lagoon and at designated location identified GJO-3. Raw sewage stays inside the lagoon for primary treatment and mature to decant out through a decant pump onto wetland for final cleanup of contamination parameters to comply MAC limits identified by environmental guidelines. A decanting structure yet to be installed, expecting before summer 2015.
- Sewage and effluent samples taken during summer and fall, tested in accredited laboratory and noted parameters contamination within allowable limits as marked for BOD₅, TSS, Fecal Coliform and PH.
- Final discharge points identified and submitted to the Board as required minimum 30 days after such identification with no changes in Final Discharge point.
- Freeboard at sewage lagoon maintained over 1.0 m (Ref. Item 3) as the sewage lagoon capacity over one year sewage generation quantity. Raw sewage remains in full containment, freeze in winter and be decanted in summer when thaws which will make room for following year sewage containment. Decanting will only help in effluent water out leaving heavier sludge (if any) on lagoon bottom which are subjected to clean up when reach to sufficient thickness (refer to O&M manual).



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ANNUAL REPORT 2014 – Water Licence: 3BM-GJO1318

YEAR BEING REPORTED: 2014

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water Licence 3BM-GJO1318 issued to the Hamlet of Gjoa Haven.

- 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
January	3,642,982.00	Same
February	3,360,142.00	Same
March	3,582,513.00	Same
April	3,687,355.80	Same
May	3,733,438.80	Same
June	3,570,432.30	Same
July	3,671,806.50	Same
August	3,693,645.00	Same
September	3,936,711.00	Same
October	4,049,575.00	Same
November	3,763,324.00	Same
December	3,704,126.00	Same
ANNUAL TOTAL	44,396,051.40	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;

- A new engineered sewage lagoon with liner on sides and base constructed in a new location behind the old lagoon and started operation Oct 03, 2013. New outfall to the existing wetland added from the new lagoon for effluent overflow (through overflow chute) and annual decanting measures. The final fall remains unchanged which covers the area outside of the solid waste site to ocean.
- Improvement to solid waste site carried with moving and compacting waste barrels down and heaping in stacks. Shaken and fallen fence were tightened as needed but wasn't covered all sides and entry gate which will require additional quantity of fence materials.
- The old lagoon decommissioning started with decanting water onto wetland, but not completed due to insufficient effort and winter weather.

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

- On Feb 25, 2014, water supply line showed very low pressure in the buried line from intake pumphouse to reheat station #2 (1.3 km). To keep the flow continuity, excess water released from buried line when line stays in full recirculation mode (pump in idle) and continuous reheat the water in line from both ends. Volume of water released for those hours estimated maximum 600,000 litre a day and continued keeping off & on water releasing until returned to full normal operation. The same situation happened last year on March 01, 2013. At that time it stayed for couple of days before coming back to normal pressure in the buried line. Full normal operation returned on April 10, 2014 without any more freeze up signs.
- Decommissioning of old lagoon deemed unauthorized since effluent discharge started before the authorization received considering the tight schedule season. Correction of such unauthorized discharged carried with acceptance and approval.

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

- Abandonment of old sewage lagoon starts soon after the sewage disposal program shifted to the new lagoon. Decanting of sewage water also started during this year but will continue the residual sewage effluent discharge and sludge remediation in 2015. Plan for full decommissioning of old lagoon in 2015 & continued if required.

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;

- Request from AANDC inspector for wetland study specifically streamline where mixing of sewage effluent with solid waste runoff happened covering areas of monitoring stations GJO-2 and GJO-4, plan for solid waste site containment.

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- Plan to isolate the effluent flow on wetland covering the area station GJO-4 and safe water flow mixing from bulky waste runoff which leads additional quantity of contamination (Copper, Manganese, and Iron etc.) to sewage effluent.
- Possible control on effluent flow rate over the wetland to maximize remediation process by utilizing sunlight and air flow.

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

- Amount of water released from buried line during the line freeze up signs and stabilized pressure in waterline for permanent solution. GN projects awarded for inspection of the water line, heat exchanger, pumps efficiency and water pressure in line on intake and recirculation mode. Study and inspection suggested for increase in pumps capacity and reheat exchanger and replacement of damaged line portion which are planned to complete in 2015 summer time. Expecting such improvement will eliminate the unexpected water discharge from the buried line and reduce chances of line freezing up.

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

- O&M manual for new sewage facility and sewage management plan updated.
- Updated O&M manual of solid waste facility and QA/QC plan

ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

- Extensive segregation program to solid waste and metal dumps carried with hamlets own resources and special assistance from MOE. Auto parts and metal reduction carried by Summer Hill, a specialist company by MOE using 31 sea cans shipped to down south. This special program has created more space for new candidate auto parts. More waste reduction can be planned with new funding.
- Improvement to waste site berm will be carried as part of new lagoon and wetland improvement and decommissioning of the old lagoon. Fencing the waste site and gate for waste site securement in plan with leachate runoff containment inside before merging to wetland. All these programs are in compliance to the guidelines of Environmental regulation and requirements outlined in the Licence.
- New HDPE (double insulated) water pipes to replace affected portion of buried line brought to site and work will be done in summer 2015

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

- Earlier submitted compliance plan has been updated. New lagoon with about 1.5 times of annual volume of raw sewage will maintain sufficient holding time for primary remediation of sewage effluent inside before decanting out.

Appendix: A

Water Licence: 3BM-GJO1318

Hamlet of Gjoa Haven, NU

Date of issuance: November 13, 2013

Date of expiry: November 12, 2018



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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

File No.: **3BM-GJO1318/Renewal**

November 13, 2013

Gord Dinney, SAO
Hamlet of Gjoa Haven
P.O. Box 200, Gjoa Haven, NU X0B 1J0

Email: goafinance@qiniq.com

Shah Alam, P. Eng
Municipal Planning Engineer, GN, C&GS
Bag 200 Cambridge Bay, NU, X0B 0C0

Email: salam@gov.nu.ca

RE: NWB Renewal Licence No. 3BM-GJO1318

Dear Mr. Dinney and Mr. Alam:

Please find attached Licence No. **3BM-GJO1318** issued to the Hamlet of Gjoa Haven 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 (Nunavut Land Claims Agreement or NLCA)*. 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 may be in contravention of the *Nunavut Land Claims Agreement* and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*. 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 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's interest, to hold a public hearing. 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 are acknowledged by the Manager of Licensing.

The NWB strongly recommends that the Licensee consult the comments received by interested persons on issues identified. This information is attached for your consideration.¹

Sincerely,



Thomas Kabloona
Nunavut Water Board
Chair

TK/kk/ri

Enclosure: Licence No. **3BM-GJO1318**
Comments – AANDC, DFO, EC, KIA

Cc: Kitikmeot Distribution List

¹ Aboriginal Affairs and Northern Development Canada (AANDC), September 28, 2013; Environment Canada (EC), August 28, 2013; Fisheries and Oceans Canada (DFO), August 5, 2013 and Kitikmeot Inuit Association (KIA), September 25, 2013.

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DECISION

LICENCE NUMBER: 3BM-GJO1318

This is the decision of the Nunavut Water Board (NWB) with respect to a complete application dated August 18, 2013 (submitted initially on April 21, 2010) for a renewal of a Water Licence made by:

HAMLET OF GJOA HAVEN

to allow for the use of water and deposit of waste during municipal activities by the Hamlet of Gjoa Haven located within the Kitikmeot Region, Nunavut generally located at the geographical coordinates as follows:

Latitude: 68° 30' N and Longitude: 95° 53' W

DECISION

After having been satisfied that the application was for a location that falls outside of an area with an approved Land Use Plan and exempt from the requirement for screening as described within Section 12.3.2 / Schedule 12-1 by the Nunavut Impact Review Board in accordance with Article 12 of the *Nunavut Land Claim Agreement (NLCA)*, the NWB decided that the application could proceed through the regulatory process. In accordance with S.55.1 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act (Act)* and Article 13 of the *NLCA*, public notice of the application was given and interested persons were invited to make representations to the NWB.

After reviewing the submission of the Applicant and considering the representations made by interested persons, 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 *Act*, waived the requirement to hold a public hearing and determined that:

Licence No. 3BM-GJO0409 be renewed as Licence No. 3BM-GJO1318 subject to the terms and conditions contained therein. (Motion #: 2013-B1-043)

Signed this 13th day of November 2013 at Gjoa Haven, NU.



Thomas Kabloona
Nunavut Water Board
Chair

TK/kk/ri

I. BACKGROUND

The Hamlet of Gjoa Haven (the Hamlet) is located at Latitude 68° 30' N and Longitude 95° 53' W, on the South-East coast of King William Island, in the Kitikmeot Region of Nunavut, approximately 142 air km SW of Kugaaruk, and 1,056 air km NE of Yellowknife. The Hamlet is approximately 40 m above the sea level, and its topography is characterized by limestone lowlands covered by sands and gravels.

Features include till, fine-grained marine deposits, and extensive beaches, numerous lakes and ponds, covered with thin layer of tundra vegetation & grasses. Despite poor soil quality, various types of lichen, moss, willow, heather and wildflowers grow in the area. Wildlife in the area mainly ground squirrels, lemmings, weasels, arctic hares, arctic foxes, ringed seals and numerous species of birds and fish. The permafrost is continuous, extending to depths from 20 m to over 120 m. The active layer varies between 0.55 m and 0.25 m. The average annual precipitation in Gjoa Haven consists of 5 cm of rainfall and 25 cm of snowfall with mean precipitations of 8 cm. Climate of Gjoa Haven is reasonable summers and extremely cold winter, average mean temperature in January -39°C to -23°C and July high & low 13.9°C and 7.2°C.

The community has a population of approximately 1260 (2006), with approximately 5.0 % of projected growth rate over the 20-year design period. Community infrastructure includes:

- A Water Treatment Plant which draws water from the Swan Lake, transport it to the treatment plant through a 2.3 km buried line and stores it after treatment for trucked water to holding tanks in each building;
- A Sewage Disposal/Treatment Facility (Lagoon) which receives trucked sewage collected from holding tanks in each building and houses, with a wetland area between the lagoon and the ocean; and
- A Solid Waste Disposal/Management Facility, which includes a bulky metals disposal area, a hazardous waste oil storage area and a battery and other materials storage area next to the solid waste site.

II. PROCEDURAL HISTORY

On January 7, 1999, the Nunavut Water Board (“NWB” or “Board”) issued the water licence NWB3GJO9904 to the Hamlet of Gjoa Haven for the use of 35000 m³ *per year* and waste disposal activities within the Hamlet. On January 8, 2004, the licence was renewed as licence 3BM-GJO0409, with the expiry date set at January 31, 2009, allowing the Hamlet use of 62,000 m³ *per year* of water and dispose of waste at specific facilities within the Hamlet. On September 4, 2008, the licence was amended to allow for the construction of a culvert and the realignment of a small creek during municipal construction and maintenance activities.

On March 30, 2009, a request to renew the Licence was submitted to the Board from the Hamlet of Gjoa Haven without any supporting information. On **April 21, 2010**, Dillon Consulting Limited (“Dillon”) submitted to the Board on behalf of the Hamlet of Gjoa Haven a renewal water licence application (“Application”) and associated documents subsequently. The Application included the following documents:

- Letter from the Hamlet requesting the renewal, dated March 30, 2009;
- Authorization to act for Dillon Consulting Limited dated December 12, 2009;
- Renewal Application Cover Letter dated March 19, 2010;
- Letter from Dillon Consulting Limited: Hamlet of Gjoa Haven Water Licence Renewal Application, dated March 19, 2010;
- Appendix A: Background Images from Google Earth, Figures 1-2, dated March 2010;
- Appendix B: Effluent Sampling Analysis Results from August 2009, dated August 28, 2009; and
- Appendix C: Gjoa Haven Waste Management Assessment Planning Report – Draft (Dillon Consulting Limited, 2008), dated March 11, 2008.

On June 23, 2010 the NWB informed Dillon, Hamlet and Government of Nunavut, Department of Community Governmental Services (GN-CGS) about deficiencies in the water licence renewal application to be addressed before proceeding with processing the water licence renewal application. The Licensee was requested to submit a Plan for Compliance to address the issues outlined in the NWB's administrative compliance assessment which was sent to the Hamlet on May 13, 2009, as well as issues identified in Inspector's reports including the failure of the sewage lagoon operation, resulting effluent quality, solid waste management, monitoring, reporting, and the submission of plans in accordance with the licence. Documents required in accordance with the licence included the following:

- Item B1 – Submission of annual reports for 2004 – 2008;
- Item D8 – Submission of a report identifying each Final Discharge Point of the existing Sewage Disposal Facility; the report shall at least include:
 - (a) Plans, specifications, geographic coordinates and a general description of each Final Discharge Point; and
 - (b) A description of how each Final Discharge Point is designed and maintained;
- Item E1 – Submission of engineered as-built drawings for the water intake modification approved on June 7, 2004;
- Item E1 – Submission of written summary and photographs of culvert installation and creek alignment;
- Item F1 – Submission of an Operations and Maintenance Manual for the sewage and solid waste disposal facilities; and
- Items F4 and F5 – Measures taken following sewage lagoon berm failure.

The NWB provided GN-CGS with the status update of the open municipal water licence applications with the NWB (including the 3BM-GJO0409 renewal application) on July 27 (revised on July 29), 2010.

On **October 27, 2010**, the Board received Executive Summaries in English and Inuktitut. Updated Executive Summaries were re-submitted to the Board on **July 15, 2011**, along with the "Plan for Compliance, Licence No. 3BM-GJO0409", dated June 2011.

On August 31, 2011, the Board advised the GN-CGS that the submitted Plan for Compliance is not functional and the information provided is not sufficient for consideration of the water

licence renewal. The Licensee was advised to address the highlighted issues and submit a functional Plan for Compliance in order that the licence renewal process may proceed.

On February 22, 2012, the Aboriginal Affairs and Northern Development Canada (AANDC) Nunavut Regional Office issued a letter of longstanding issues of non-compliance of water licenses in Nunavut Municipalities including the Hamlet of Gjoa Haven. A summary list of non-compliance identified by AANDC Inspection between 2007 and 2011 was attached to this letter. On June 28, 2012, the AANDC issued an Inspector's Direction requiring GN-CGS to bring the identified communities (including Gjoa Haven) into compliance with the Act, and in the interim, submit compliance planning documents as described therein, and outlining the Terms and Conditions to be met within the specified timelines.

The August 22, 2012 AANDC Inspection Report indicated a number of reoccurring issues of Non-compliance within the municipality between 2002 and 2011:

On **December 21, 2012**, GN-CGS submitted to the Board the following additional information on behalf of the Hamlet:

- 2011 and 2012 Annual Reports with Water, Sewage and Solid Waste 2012 Annual Monitoring Results; and
- Plan for Compliance dated December 12, 2012.

The following additional information was submitted to the Board in **July-August, 2013:**

July 7, 2013

- Gjoa Haven Sewage Lagoon Re-Issued for Tender Engineered Drawings prepared by Dillon and dated September, 2012:
 - o Project 11-5029-1000 No. 100: Location Plan;
 - o Project 11-5029-1000 No. 101: Access Road and Turnaround Pad;
 - o Project 11-5029-1000 No. 102: Lagoon Berm Details;
 - o Project 11-5029-1000 No. 103: North Ditch;
 - o Project 11-5029-1000 No. 104: Berm and Shute Details; and
 - o Project 11-5029-1000 No. 105: Emergency Overflow Fence, and Liner details.
- Government of Nunavut, Community Visit Report – Gjoa Haven prepared by exp Services Inc. March 2013.

July 26, 2013

- Gjoa Haven Water Licence 3BM-GJO0409 Monitoring Stations of Sewage and Solid Waste sample collection; and
- AANDC August 24, 2012 Inspection Report with GN-CGS comments.

August 18, 19, 30 2013

- Water Licence Renewal Application dated August 18, 2013;
- Hamlet of Gjoa Haven Nunavut Sewage Treatment Facility Operation and Maintenance (O&M) Plan dated August 15, 2013; and
- Hamlet of Gjoa Haven Nunavut Solid Waste Treatment Facility Operation and Maintenance (O&M) Plan dated August 15, 2013;
- Executive Summary in English and updated Plan for Compliance dated August 19, 2013;

- Environmental Monitoring Program – Sample Collection Training Program prepared by **exp** Services Inc. August 13, 2013;
- Hamlet of Gjoa Haven **Quality Assurance / Quality Control (QA/QC) Plan** prepared by **exp** Services Inc. **August 2013**, and
- Executive Summary in Inuktitut.

On August 28, 2013, following a preliminary internal technical review, the NWB concluded that the Application met the requirements of section 48(1) of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSRTA or Act) and forwarded notice of the Application to regulators, council of the municipality most affected by the project and other interested parties. All parties were invited to make representations to the NWB within thirty (30) days.

On or before September 28, 2013, comments were received from AANDC, Environment Canada (EC), Fisheries and Oceans Canada (DFO) and Kitikmeot Inuit Association (KIA). No public concerns were expressed during the notice period. In consideration of the comments received, the NWB determined that a public hearing would not be required and proceeded with the application process.

Based upon the results of the completed detailed assessment, including consideration of any potential accidents, malfunctions, or cumulative environmental effects that the overall project might have in the area, the Board has approved the application for the renewal of Licence No. 3BM-GJO0409 as Licence No. **3BM-GJO1318**.

III. ISSUES

Term of the Licence

In accordance with the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* S. 45, the NWB may issue a licence for a term not exceeding twenty-five (25) years. In determining an appropriate term of a water licence, the Board considers a number of factors, including the results of the AANDC's annual site inspection and the compliance record of the Applicant.

Specifically, the last July 17, 2013 AANDC Inspection Report indicated the following reoccurring issues of Non-compliance of Act or Licence within the municipality:

- Undertaking the construction of the new Lagoon system without the approval of the NWB as required by Items 1, 2 and 3 of Part E: Conditions applying to Modification and Construction, and by Item 1(ii) of Part G: Conditions applying to Abandonment and restoration;
- Use of water and deposit of waste without the authority of a license;
- Failed to supply the NWB with the outstanding documents required to process the application for renewal as indicated in the Plan for Compliance: QA/QC Plan, Final Discharge Points Report, Abandonment and Restoration (A&R) Plan for the current (old) Lagoon, and Monitoring Program.

The NWB is fully aware of reoccurring Non-compliance issues with respect to the Act in the context of the Licence issued to the Municipality. The NWB acknowledges, however, that

some of outstanding documents were provided to the Board just before the AANDC Inspection and some shortly after the Inspection with the exception of A&R Plan for the current (to be decommissioned) Lagoon. Further, the Licensee has committed to submitting the A&R Plan for the current Lagoon by the end of 2013 as indicated in its Plan for Compliance.

The Licensee has requested a five (5) year term for the renewal licence, which is supported in AANDC - Water Resources Division's submission. AANDC notes, however, that there is several outstanding compliance issues associated with the current undertaking and activities that should be considered during the renewal process. The application includes a compliance plan outlining short-term and long-term goals to bring the Hamlet into compliance with the obligations of its water licence. It should be noted that some of the commitments and goals have already been reached in the short-term plan including the submission of requested plans, annual reports and the carrying out of monitoring activities. However, the long-term goals, which are expected to be met under this 5-year renewal licence, are designed to address ongoing issues that the Hamlet must resolve in order to meet its obligations (i.e. continued monitoring, annual reporting, and alternative solutions for measuring sewage discharge).

The Board recognizes that improvements are made by Licensee during the last year in trying to address the Non-Compliance issues and to reach the short-term compliance goals, and the Board believes that a licence term of five (5) years will provide a realistic opportunity for the Licensee to prove to the Board that it can meet the long-term requirements as well as establish a consistent compliance record with respect to the requirement under the terms and conditions of its licence. The five (5) year renewal licence will also ensure that sufficient time is given to permit the Licensee to develop, submit, and implement the plans required under its licence to the satisfaction of the NWB.

Annual Reports

As part of its obligation under this Licence, the Licensee is required to generate and submit to the Board for review, on an annual basis, a report that pertains to its undertakings and activities. The report is for the purpose of ensuring that the NWB has an accurate update of municipal activities during each calendar year. This information is maintained on the public registry and is available to any interested parties upon request.

Water Use

The Municipality currently receives its freshwater supply from Swan Lake, which is located approximately 3.5 km north-west from the Hamlet. The freshwater transmission line from Swan Lake to the pump house includes a recirculation system to prevent the water lines from freezing and rupturing.

Water is stored in a single-cell reservoir, adjacent to the truck fill station, prior to primary treatment and disinfection, which is followed by distributed to the community. Under the expired licence, 62,000 m³ of water per year was allowed, and the Licensee has requested no changes to the water quantity for all purposes under the renewal licence. The Board has, therefore, set the maximum water usage for all purposes specified in this Licence at 62,000 m³ per year or 170 m³ per day.

Apart from the above, it should be understood that discussions are currently ongoing with respect to the definition of the term “water use” with specific reference to recirculation. The inclusion of water used in recirculation could result in higher amounts of reported water use contingent on the definition of the term. AANDC recommended that the Proponent monitor water used for all purposes including direct discharge and the quantity of water used for recirculation purposes pending the outcome of the discussions on the term “water use”.

Deposit of Waste

Sewage

The Hamlet of Gjoa Haven utilizes a Sewage Disposal/Treatment Facility located approximately 1 km east from the Municipality. The facility includes a truck discharge point and turn-around pad approximately 55 m wide, two discharge chute 15 m each, main detention single-cell Lagoon of 22,700 m³ (currently in capacity), effluent overflow chute with more than 1.5 m freeboard on sewage water storage and earthen-gravel berm all around. The effluent from this Lagoon proceeds downstream to the ocean through an undefined, natural tundra wetland along a 1050 m flow path prior to entering the marine environment, thus total linear distance from truck off-load point to ocean is about 1275 m.

The current Lagoon used by the Hamlet is operating in excess of its optimal capacity and remains full throughout the year. The Hamlet is currently constructing a much larger Lagoon system to alleviate issues associated with the existing Lagoon which according to the Licensee’s Plan from Compliance is expected to be operational by the end of 2013.

As stated by AANDC, the new Lagoon system is being constructed without approvals from the Nunavut Water Board as is still required under the terms of expired water licence. AANDC states that an application for modification and construction was not submitted by the Proponent and therefore has not been circulated to parties for review and comment. The document entitled “The GN-CGS Gjoa Haven Sewage Lagoon – Re-Issued for Tender, Revision 1” dated September, 2012 and prepared by Dillon Consulting was submitted to the NWB on July 8, 2013 as additional information. The report includes the new sewage Lagoon’s Issued for Tender Engineered drawings.

As required by the previous licence a Plan entitled “*Hamlet of Gjoa Haven, Nunavut Sewage Treatment Facility Operation and Maintenance (O&M) Plan*”, dated August 15, 2013, has been included with the renewal application. The O&M Plan is to assist Hamlet staff in the proper operation and maintenance of their Sewage Waste Disposal Facility. The Board has approved the Plan under Part F, Item 1 of the renewed licence.

The Licensee is also advised that the addition of new infrastructure (i.e. new Sewage Lagoon) under the existing Licence would be considered as an amendment to the licence. An amendment application with an updated O&M Plan for Sewage Treatment Facility needs to be provided for the Board's consideration prior to commissioning the new Lagoon.

AANDC stated that plans for Abandonment and Reclamation have not been provided to the Board for the decommissioning of the existing Lagoon. According to the Plan for Compliance, an Abandonment and Reclamation (A&R) Plan for the current Lagoon is scheduled to be submitted to the NWB in December 2013. The Licensee intends to implement the A&R Plan for the current Lagoon once the new Lagoon is commissioned, expecting by March 2014.

The Licensee is advised that under Part G, Item 1 an A&R Plan shall be submitted to the Board for approval at least three (3) months prior to abandoning any facilities and the construction of new facilities to replace existing ones.

Solid Waste

The Solid Waste Disposal/Management Facility for Gjoa Haven is located adjacent to the Sewage Disposal Facility approximately 1.5 km east of the community, southern from the Lagoon. Access to the site is via a gravel road. The Solid Waste Facility has three main areas:

- (i) area for general municipal waste disposal,
- (ii) area for bulky wastes, and
- (iii) area for hazardous waste.

The general municipal waste area is fenced but does not have a gate and so access to the community is not limited. Waste is generally piled and crushed within the fenced area and from time to time the Hamlet open burns suitable waste during the summer and fall periods on routine basis depending on weather.

As required under the previous licence, a Plan entitled "*Hamlet of Gjoa Haven, Nunavut Solid Waste Treatment Facility Operation and Maintenance O&M Plan*," dated August 15, 2013 has been included with the renewal application. The O&M Plan is to assist Hamlet staff in the proper operation and maintenance of the Solid Waste Disposal Facility. The Board has approved the Plan under Part F, Item 2 of the renewal licence.

AANDC Inspectors have expressed concern over water management and site runoff within the Solid Waste Management Area (SWMA) and the potential for contamination. Specific concerns were noted by the Water Resources Officer during several inspections, that a second cell for the waste water lagoon has been constructed to contain flow from the overflow pipe at the current lagoon. The waste water is then channeled into a long ditch that runs down gradient behind SWMA. Runoff from the SWMA mixes with effluent from the overflow and continues down to the ocean.

Further, the Inspector noted that Site runoff from the Solid Waste Management Area should be managed properly so as to not impact the surrounding wetland or water-bodies. The site inspection by the Water Resource Officer also noted evidence that hazardous materials are scattered throughout the SWMA and many drums of waste oils and other fluids were found outside the SWMA. In addition water was observed to be running through and exiting the facility and is not contained in any way. Accordingly, AANDC recommends that the Proponent ensure site runoff is properly managed so that there is no impact to the natural environment in terms of contamination.

The Board concurs that the Hamlet should give serious consideration to AANDC's recommendation, and in the interim take whatever steps are practicable to prevent any impact to the environment.

The Licensee proposed in its monitoring program that additional monitoring of solid waste leachate accumulated in retention area when decanting. The Board has included an additional monitoring program station for the leachate to be sampled before decanting from solid waste leachate retention area.

Monitoring Program

Environmental Monitoring Plan

An "Environmental Monitoring Program – Sample Collection Training Program," dated August 13, 2013 has been included with the renewal application. The document is to provide guidance/training on how to properly collect and submit water and waste water samples to ensure that the environmental monitoring program obtain results that accurately reflect the physical and chemical nature of the matrix being tested. This Program is established to collect data on water quality, assess the effectiveness of treatment for protection of public health and assess potential impacts to the environment associated with the municipal facilities. The Board has approved the Plan under Pat H, Item 1.

The Licensee included with the renewal application a "Monitoring Stations of Sewage and Solid Waste Sample Collection", as required by Part D, Item 8 of the previous Licence. The Board requires if, during the term of this Licence, additional Final Discharge Points are identified, the Licensee shall submit the new Final Discharge Point's pertaining information, within 30 days after the discharge point is identified and at least 60 days prior to discharging Effluent.

It should also be noted that while minimum sampling requirements have been imposed, additional sampling may be requested by an Inspector.

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

The requirement to submit a Quality Assurance / Quality Control (QA/QC Plan) is to provide the necessary checks and controls under the Licence for sampling, monitoring and reporting for Hamlet of Gjoa Haven. The purpose of the QA/QC Plan is to ensure that samples taken in the

field as part of the Monitoring Program will maintain a high quality, so as to accurately represent the physical and chemical nature of the samples being taken. These procedures are generally developed from literature and guidelines and are intended to promote good practices in environmental management.

The “*Hamlet of Gjoa Haven Quality Assurance / Quality Control Plan*” included with renewal application has been developed by exp. Services Inc. The Plan was approved by an analyst on August 13, 2013.

The NWB has included a requirement under Part H, Item 11, to annually review the QA/QC Plan and modify it as necessary. Revised QA/QC Plans shall be submitted to the Board with a current approval letter from an accredited lab and shall meet the requirements set out in Part H, Items 9 and 10.



NUNAVUT WATER BOARD WATER LICENCE RENEWAL

Licence No. **3BM-GJO1318**

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

HAMLET OF GJOA HAVEN

(Licensee)

P.O BOX 200 GJOA HAVEN, NUNAVUT, X0B 1J0

(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 renewal:

Licence Number/Type: 3BM-GJO1318 TYPE "B"

Water Management Area: KING WILLIAM ISLAND WATERSHED (41)

Location: GJOA HAVEN
KITIKMEOT REGION, NUNAVUT

Classification: MUNICIPAL UNDERTAKING

Purpose: DIRECT WATER USE AND DEPOSIT OF WASTE

Quantity of Water use not
to Exceed: 62,000 CUBIC METRES PER ANNUM OR 170 CUBIC
METRES PER DAY

Date of Licence Issuance: NOVEMBER 13, 2013

Expiry of Licence: NOVEMBER 12, 2018

This Licence renewal issued and recorded at Gjoa Haven, Nunavut includes and is subject to the annexed conditions.

Thomas Kabloona,
Nunavut Water Board, Chair

PART A: SCOPE, DEFINITIONS AND ENFORCEMENT

1. Scope

This Licence allows for the use of water and the deposit of waste for a Municipal undertaking classified as per Schedule 1 of the *Regulations* at the Hamlet of Gjoa Haven in Kitikmeot Region, Nunavut (Latitude 68° 30' N and Longitude 95° 53' W).

- a. 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
- b. 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

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

“Addendum” means the supplemental text that is added to a full plan or report usually included at the end of the document and is not intended to require a full resubmission of the revised report.

“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;

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

“Board” means the Nunavut Water Board established under the *Nunavut Land Claims Agreement* and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*;

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

“Engineer” means a professional engineer registered to practice in Nunavut in accordance with the *Consolidation of Engineers and Geoscientists Act S. Nu 2008, c.2*

and the *Engineering and Geoscience Professions Act S.N.W.T. 2006, c.16 Amended by S.N.W.T. 2009, c.12*;

“Final Discharge Point” means an identifiable discharge point of a Waste Disposal Facility beyond which the Licensee no longer exercises care and 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;

“Grab Sample” means an undiluted quantity of material collected at a particular time and place that may be representative of the total substance being sampled at the time and place it was collected;

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

“High Water Mark” means the usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land (ref. Department of Fisheries and Oceans Canada, Operational Statement: Mineral Exploration Activities);

“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 a new structure or eliminates an existing structure and does not alter the purpose or function of the work, but does not include an expansion;

“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;

“Regulations” means the *Nunavut Waters Regulations SOR/2013-69 18th April, 2013*;

“Sewage” means all toilet wastes and greywater;

“Sewage Disposal Facilities” comprises the area and engineered Lagoon and decant structures designed to contain and treat sewage as described in the Application for Water Licence renewal filed by the Applicant on October 9, 2003 and August 18, 2013, and illustrated in Drawing # 99-6790;

“Solid Waste Disposal Facilities” comprises the area and associated structures designed to contain solid waste as described in the Application for Water Licence renewal filed by the Applicant on October 9, 2003 and August 18, 2013, and illustrated in Drawing # 99-6790;

“Spill Contingency Plan” means a Plan developed to deal with unforeseen petroleum and hazardous materials events that may occur during the operations conducted under the Licence;

“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 Facilities and Solid Waste Disposal Facilities (including Hazardous Waste management area), as described in the Application for Water Licence renewal filed by the Applicant on October 9, 2003 and August 18, 2013, and illustrated in Drawing # 99-6790;

“Water” or “Waters” means waters as defined in section 4 of the Act; and

“Water Supply Facilities” comprises the area and associated intake infrastructure at Swan Lake and/or Water Lake Water Supply, as described in the Application for Water Licence renewal filed by the Applicant on October 9, 2003 and August 18, 2013, and illustrated in Drawing #s 02-0602-1000/1-4.

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*; and
- 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.

PART B: GENERAL CONDITIONS

1. The Licensee shall file an Annual Report on the Appurtenant Undertaking with the Board no later than March 31st of the year following the calendar year being reported, containing the following information:
 - a. tabular summaries of all data generated under the “Monitoring Program”;
 - b. summary of modifications to the “Monitoring Program” in accordance with Part H, Item 12;
 - c. the daily, monthly and annual quantities in cubic metres of freshwater obtained from all sources;
 - d. the daily, monthly and annual quantities in cubic metres of each and all waste discharged; including the hazardous and non-hazardous waste accepted at the Solid Waste Facilities;
 - e. 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;
 - f. a list of unauthorized discharges and summary of follow-up action taken;
 - g. a summary of any abandonment and restoration work completed during the year and an outline of any work anticipated for the next year;
 - h. a summary of any studies, reports and plans (e.g., Operation and Maintenance, Abandonment and Restoration, QA/QC) requested by the Board that relate to waste disposal, water use or reclamation, and a brief description of any future studies planned;
 - i. any other details on water use or waste disposal requested by the Board by November 1st of the year being reported.
2. The Licensee shall notify the NWB of any changes in operating plans or conditions associated with this project at least thirty (30) days prior to any such change.
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. The Licensee shall install flow meters or other such devices, or implement suitable methods required for the measuring of water volumes as required under Part H, Item 1.
6. The Licensee shall, post the necessary signs, where possible, to identify the stations of the “Monitoring Program”. All signage postings shall be in the Official Languages of Nunavut, and shall be located and maintained to the satisfaction of an Inspector.
7. The Licensee shall immediately report to the 24-Hour Spill Report Line at (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.
8. The Licensee shall, for all Plans submitted under this Licence, include a proposed timetable for implementation. Plans submitted, cannot be undertaken without subsequent written Board approval and/or direction. The Board may alter or modify a Plan if necessary to achieve the legislative objectives and will notify the Licensee in writing of acceptance, rejection or alteration of the Plan.
9. The Licensee shall, for all Plans submitted under this Licence, implement the Plan as approved by the Board in writing.
10. The Licensee shall review the Plans referred to in this Licence, as required by changes in operation and/or technology, and modify the Plan accordingly. Revisions to the Plans shall be submitted in the form of an Addendum to be included with the Annual Report.
11. 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 conditions 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.
12. The Licensee shall ensure a copy of this Licence is maintained at the site of operations 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:

Manager of Field Operations, AANDC
Nunavut District, Nunavut Region
P.O. Box 100

Iqaluit, NU X0A 0H0
Telephone: (867) 975-4295
Fax: (867) 979-6445

13. 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.
14. The Licensee shall ensure that any document(s) or correspondence submitted by the Licensee to the NWB is received and acknowledged by the Manager of Licensing.
15. This Licence is assignable as provided for in Section 44 of the *Act*.

PART C: CONDITIONS APPLYING TO WATER USE

1. The Licensee shall obtain all freshwater processed by the Water Supply Facilities and/or used for municipal purposes from Swan Lake or as otherwise approved by the Board in writing.
2. The annual quantity of water use for all purposes under this Licence shall not exceed sixty-two thousand (62,000) cubic metres per year or one hundred seventy (170) cubic metres per day.
3. Where the use of water is of a sufficient volume that the source Water body may be drawn down, the Licensee shall submit to the Board for approval in writing the following: the volume required a hydrological overview of the water body, details of impacts, and proposed mitigation measures.
4. The Licensee shall maintain the Water Supply Facilities to the satisfaction of the Inspector.
5. The Licensee shall equip all water intake hoses with a screen of appropriate mesh size to ensure that fish are not entrained and shall withdraw water at a rate such that fish do not become impinged on the screen.
6. The Licensee shall not remove any material from below the ordinary High Water Mark of any water body unless approved by the Board in writing.
7. The Licensee shall not cause erosion to the banks of any body of water and shall provide necessary controls to prevent such erosion.
8. Sediment and erosion control measures shall be implemented prior to and maintained as required during Hamlet operations, to prevent entry of sediment into water.

PART D: CONDITIONS APPLYING TO WASTE DISPOSAL

1. The Licensee shall direct all Sewage to the current Sewage Disposal Facilities or as otherwise approved by the Board.
2. All Effluent discharged from the Sewage Disposal Facilities at Monitoring Program Station GJO-4 shall meet the following effluent quality standards:

Parameter	Maximum Concentration of any Grab
Faecal Coliforms	1×10^4 CFU/dl
BOD ₅	80 mg/L
Total Suspended Solids	100 mg/L
Oil and grease	No visible sheen
PH	Between 6 and 9

3. A Freeboard limit of at least 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 any decant of the Sewage Lagoon.
5. The 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 implement measures to prevent hazardous materials and/or leachate from the Solid Waste Disposal Facility from entering water.
8. Licensee shall submit, within 30 days after the discharge point is identified and at least 60 days prior to discharging Effluent, the following information for any new Final Discharge Points or changes made to existing Final Discharge Points during the term of the licence:
 - a. Plans, specifications and a general description of each Final Discharge Point together with its specific geo-referenced location;
 - b. A description of how the additional Final Discharge Point is designed and maintained.
9. The Licensee shall use material that is free of contaminants for construction, operation, and maintenance activities and that is obtained from approved sources and has been demonstrated not to be potentially acid generating and metal leaching.

PART E: CONDITIONS APPLYING TO MODIFICATION AND CONSTRUCTION

1. The Licensee shall submit to the Board for approval, for construction drawings stamped and signed by a qualified engineer registered in Nunavut, sixty (60) days prior to the construction of any dams, dykes or structures intended to contain, withhold, divert or retain water or wastes.
2. The Licensee may, without written consent from the Board, carry out Modifications to the Water Supply Facilities 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. such Modifications do not place the Licensee in contravention of the Licence or the Act;
 - c. such Modifications are consistent with the NIRB Screening Decision;
 - d. 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
 - e. the Board has not rejected the proposed Modifications.
3. The Modifications for which all of the conditions referred to in Part E, Item 2(a) through (d), have not been met, may only be carried out upon written approval from the Board.
4. The Licensee shall, within ninety (90) days of completion of Modification or Construction of facilities and/or infrastructure associated with the project, submit to the Board a Construction Summary Report along with stamped as-built plans and drawings, providing explanation to reflect any deviations from for construction drawings taking into account construction and field decisions and how they may affect the performance of engineered facilities.
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 implement and maintain erosion control measures during activities carried out under this Part, to prevent impacts to water resulting from the release of sediment and minimize erosion.
7. With respect to earthworks, the deposition of debris or sediment into or onto any water body is prohibited. These materials shall be disposed a distance of at least thirty-one (31) metres from the ordinary High Water Mark in such a fashion that they do not enter the water.

PART F: CONDITIONS APPLYING TO OPERATION AND MAINTENANCE

1. The Board has approved the Plan entitled “Hamlet of Gjoa Haven Sewage Treatment Facility Operation and Maintenance (O&M) Plan” dated August 15, 2013 that was submitted as additional information with the Application.
2. The Board has approved the Plan entitled “Hamlet of Gjoa Haven, Nunavut Solid Waste Treatment Facility Operation and Maintenance (O&M) Plan” dated August 15, 2013 that was submitted as additional information with the Application.
3. 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 Spill Contingency Plan as provided in the Operation and Maintenance Plan. Take whatever steps are immediately practicable to protect human life, health and the environment;
 - b. report the incident immediately via the 24-Hour Spill Reporting Line at (867) 920-8130 and to the AANDC Manager of Field Operations at (867) 975-4295; 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.

PART G: CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION

1. The Licensee shall submit to the Board for approval, an Abandonment and Restoration Plan at least three (3) months prior to abandoning any facilities or the construction of new facilities to replace existing ones. Where applicable, the Plan shall include information on the following:
 - a. water intake facilities;
 - b. the water treatment and waste disposal sites and facilities;
 - c. abandoned water and waste 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. The Licensee shall complete all restoration work within the time schedule specified in the Plan, or as subsequently revised and approved by the Board.
3. The Licensee shall carry out progressive reclamation of any components of the project no longer required for the Licensee's operations.
4. In order to promote growth of vegetation and the needed microclimate for seed deposition, all disturbed surfaces shall be prepared by ripping, grading, or scarifying the surface to conform to the natural topography.
5. Areas that have been contaminated by hydrocarbons shall be reclaimed to meet objectives as outlined in the Government of Nunavut's Environmental Guideline for Site Remediation, January 2002. The use of reclaimed soils for the purpose of back fill or general site grading may be carried out only upon consultation and approval by the Government of Nunavut, Department of Environment and an Inspector.

PART H: CONDITIONS APPLYING TO THE MONITORING PROGRAM

1. The Board has approved the Plan entitled "Environmental Monitoring Program – Sample Collection Training Program" dated August 13, 2013 that was submitted as additional information with the Application.
2. The Licensee shall maintain Monitoring Program Stations at the following locations:

Monitoring Program Station Number	Description	Frequency	Status
GJO-1	Raw Water Supply at Swan Lake	Monthly	Active (Volume)
GJO-2	Effluent Final Discharge Point from Solid Waste Disposal Facility	Monthly (May to August)	Active (Quality)
GJO-3	Raw Sewage at truck offload point	Monthly	Active (Volume)
GJO-4	Effluent Final Discharge Point from Sewage Disposal Facility	Monthly (May to August)	Active (Quality)
GJO-5	Solid Waste leachate retention inside berm	Sample collected when decanting requires	Active (Quality)

3. The Licensee shall measure and record, in cubic metres, the daily, monthly and annual quantities of water extracted for all purposes at Monitoring Program Station GJO-1.

4. The Licensee shall sample monthly at Monitoring Station GJO-2 and GJO-4 during the months of May to August, inclusive. Sample shall be analyzed for the following parameters:

BOD	Faecal Coliforms
pH	Conductivity
Total Suspended Solids	Ammonia Nitrogen
Nitrate-Nitrite	Oil and Grease (visual)
Total Phenols	Sulphate
Sodium	Potassium
Magnesium	Calcium
Total Arsenic	Total Cadmium
Total Copper	Total Chromium
Total Iron	Total Lead
Total Mercury	Total Nickel
Total Zinc	

5. The Licensee shall measure and record in cubic metres the daily, monthly and annual quantities of raw sewage offloaded from trucks at Monitoring Station GJO-3 for all purposes.

6. The Licensee shall provide the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where sources of water are utilized for all purposes.

7. The Licensee shall sample before decanting at Monitoring Station GJO-5. Samples shall be analyzed for the parameters stated in Part H, Item 4.

8. Additional sampling and analysis may be requested by an Inspector.

9. 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 by such other methods approved by the Board in writing.

10. All analyses shall be performed in a laboratory accredited according to ISO/IEC Standard 17025. The accreditation shall be current and in good standing.

11. The Licensee shall annually review the QA/QC Plan and modify it as necessary. Revised QA/QC Plans shall be submitted to the Board with a current approval letter from an accredited lab and shall meet the standards set out in Part H, Item 9 and Part H, Item 10 of the Licence.

12. The Licensee shall include all of the data and information required by the Monitoring Program in the Licensee's Annual Report, as required per Part B, Item 1 or as otherwise requested by an Inspector.
13. Modifications to the Monitoring Program including the Monitoring Program Stations and parameters may be made only upon written approval of the Board.

Appendix: B

Effluent Sample Results 2014

Hamlet of Gjoa Haven, NU

Date of samples:

(i) Sep 03, 2014

(ii) Sep 22, 2014



Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-765-6645 Fax: (867)-669-2718

Taiga Batch No.:
140779

- PRELIMINARY REPORT -

Prepared For: Hamlet of Gjoa Haven

Address: P.O. Box 200
Gjoa Haven, NU
X0B 1J0

Attn: Shawn Stuckey

Facsimile: (867) 360-6309

Final report has been reviewed and approved by:

Judy Mah
Client Service Officer

NOTES:

- Test methods and data are validated by the laboratory's Quality Assurance Program. Taiga Environmental Laboratory is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) to ISO/IEC 17025 as a testing laboratory for specific tests registered with CALA.
- Routine methods are based on recognized procedures from sources such as
 - o Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF;
 - o Environment Canada
 - o USEPA
- Samples shall be kept for thirty (30) days after the final report is issued. All microbiological samples shall be disposed of immediately upon completion of analysis to minimize biohazardous risks to laboratory personnel. Please contact the laboratory if you have any special requirements.
- Final results are based on the specific tests at the time of analysis and do not represent the conditions during sampling.

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Taiga Environmental Laboratory

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Tel: (867)-765-6645 Fax: (867)-669-2718

Taiga Batch No.:
140779

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GJO-3 (New)**

Taiga Sample ID: **001**

Client Project:

Sample Type: Water

Received Date: 04-Sep-14

Sampling Date: 03-Sep-14

Sampling Time:

Location:

Report Status: Preliminary

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen		0.005	mg/L		SM4500-NH3:	
Biochemical Oxygen Demand	>91.80	2	mg/L	05-Sep-14	SM5210:B	62
Organic Carbon, Total	160	0.5	mg/L	10-Sep-14	SM5310:B	
<u>Inorganics - Physicals</u>						
Alkalinity, Total (as CaCO ₃)	485	0.4	mg/L	04-Sep-14	SM2320:B	
Conductivity, Specific (@25C)	1580	0.4	µS/cm	04-Sep-14	SM2510:B	
pH	7.72		pH units	04-Sep-14	SM4500-H:B	
Solids, Total Suspended	110	3	mg/L	10-Sep-14	SM2540:D	
<u>Major Ions</u>						
Calcium	31.1	0.1	mg/L	04-Sep-14	SM4110:B	
Chloride	175	0.7	mg/L	04-Sep-14	SM4110:B	
Hardness	183	0.7	mg/L	04-Sep-14	SM4110:B	
Magnesium	25.7	0.1	mg/L	04-Sep-14	SM4110:B	
Nitrate as Nitrogen	0.08	0.01	mg/L	04-Sep-14	SM4110:B	

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Taiga Batch No.:

140779

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GJO-3 (New)**

Taiga Sample ID: **001**

Nitrite as Nitrogen	< 0.01	0.01	mg/L	04-Sep-14	SM4110:B
Potassium	35.2	0.1	mg/L	04-Sep-14	SM4110:B
Sodium	126	0.1	mg/L	04-Sep-14	SM4110:B
Sulphate	4	1	mg/L	04-Sep-14	SM4110:B

Microbiology

Coliforms, Fecal	210000	1	CFU/100mL	04-Sep-14	SM9222:D
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Organics

Hexane Extractable Material		2.0	mg/L		EPA1664A
Oil and Grease, visible					Visual Exam

Trace Metals, Total

Aluminum		5	µg/L		EPA200.8
Arsenic		0.2	µg/L		EPA200.8
Cadmium		0.1	µg/L		EPA200.8
Chromium		0.1	µg/L		EPA200.8
Cobalt		0.1	µg/L		EPA200.8
Copper		0.2	µg/L		EPA200.8
Iron		5	µg/L		EPA200.8
Lead		0.1	µg/L		EPA200.8
Manganese		0.1	µg/L		EPA200.8
Mercury		0.01	µg/L		EPA200.8
Nickel		0.1	µg/L		EPA200.8
Zinc		5	µg/L		EPA200.8

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Taiga Batch No.:
140779

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GJO-2**

Taiga Sample ID: **002**

Client Project:

Sample Type: Water

Received Date: 04-Sep-14

Sampling Date: 03-Sep-14

Sampling Time:

Location:

Report Status: Preliminary

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen		0.005	mg/L		SM4500-NH3:	
Biochemical Oxygen Demand	167	2	mg/L	05-Sep-14	SM5210:B	
Organic Carbon, Total	287	0.5	mg/L	10-Sep-14	SM5310:B	
<u>Inorganics - Physicals</u>						
Alkalinity, Total (as CaCO ₃)	717	0.4	mg/L	04-Sep-14	SM2320:B	
Conductivity, Specific (@25C)	4090	0.4	µS/cm	04-Sep-14	SM2510:B	
pH	7.27		pH units	04-Sep-14	SM4500-H:B	
Solids, Total Suspended	100	3	mg/L	10-Sep-14	SM2540:D	
<u>Major Ions</u>						
Calcium	408	0.1	mg/L	04-Sep-14	SM4110:B	
Chloride	360	0.7	mg/L	04-Sep-14	SM4110:B	
Hardness	1430	0.7	mg/L	04-Sep-14	SM4110:B	
Magnesium	100	0.1	mg/L	04-Sep-14	SM4110:B	
Nitrate as Nitrogen	0.10	0.01	mg/L	04-Sep-14	SM4110:B	
Nitrite as Nitrogen	4.41	0.01	mg/L	04-Sep-14	SM4110:B	
Potassium	101	0.1	mg/L	04-Sep-14	SM4110:B	

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Taiga Batch No.:
140779

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GJO-2**

Taiga Sample ID: **002**

Sodium	380	0.1	mg/L	04-Sep-14	SM4110:B
Sulphate	1140	1	mg/L	04-Sep-14	SM4110:B

Microbiology

Coliforms, Fecal	20	10	CFU/100mL	04-Sep-14	SM9222:D
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Organics

Oil and Grease, visible					Visual Exam
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Trace Metals, Total

Aluminum	5	µg/L	EPA200.8
Arsenic	0.2	µg/L	EPA200.8
Cadmium	0.1	µg/L	EPA200.8
Chromium	0.1	µg/L	EPA200.8
Cobalt	0.1	µg/L	EPA200.8
Copper	0.2	µg/L	EPA200.8
Iron	5	µg/L	EPA200.8
Lead	0.1	µg/L	EPA200.8
Manganese	0.1	µg/L	EPA200.8
Mercury	0.01	µg/L	EPA200.8
Nickel	0.1	µg/L	EPA200.8
Zinc	5	µg/L	EPA200.8

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4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-765-6645 Fax: (867)-669-2718

Taiga Batch No.:
140779

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GJO-4**

Taiga Sample ID: **003**

Client Project:

Sample Type: Water

Received Date: 04-Sep-14

Sampling Date: 03-Sep-14

Sampling Time:

Location:

Report Status: Preliminary

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen		0.005	mg/L		SM4500-NH3:	
Biochemical Oxygen Demand	18	2	mg/L	05-Sep-14	SM5210:B	
Organic Carbon, Total	57.7	0.5	mg/L	10-Sep-14	SM5310:B	
<u>Inorganics - Physicals</u>						
Alkalinity, Total (as CaCO ₃)	282	0.4	mg/L	04-Sep-14	SM2320:B	
Conductivity, Specific (@25C)	1040	0.4	µS/cm	04-Sep-14	SM2510:B	
pH	7.28		pH units	04-Sep-14	SM4500-H:B	
Solids, Total Suspended	197	3	mg/L	10-Sep-14	SM2540:D	
<u>Major Ions</u>						
Calcium	38.9	0.1	mg/L	04-Sep-14	SM4110:B	
Chloride	157	0.7	mg/L	04-Sep-14	SM4110:B	
Hardness	220	0.7	mg/L	04-Sep-14	SM4110:B	
Magnesium	29.9	0.1	mg/L	04-Sep-14	SM4110:B	
Nitrate as Nitrogen	0.13	0.01	mg/L	04-Sep-14	SM4110:B	
Nitrite as Nitrogen	0.04	0.01	mg/L	04-Sep-14	SM4110:B	
Potassium	16.1	0.1	mg/L	04-Sep-14	SM4110:B	

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Tel: (867)-765-6645 Fax: (867)-669-2718

Taiga Batch No.:
140779

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GJO-4**

Taiga Sample ID: **003**

Sodium	123	0.1	mg/L	04-Sep-14	SM4110:B
Sulphate	3	1	mg/L	04-Sep-14	SM4110:B

Microbiology

Coliforms, Fecal	< 10	10	CFU/100mL	04-Sep-14	SM9222:D
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Organics

Oil and Grease, visible					Visual Exam
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Trace Metals, Total

Aluminum	5	μg/L	EPA200.8
Arsenic	0.2	μg/L	EPA200.8
Cadmium	0.1	μg/L	EPA200.8
Chromium	0.1	μg/L	EPA200.8
Cobalt	0.1	μg/L	EPA200.8
Copper	0.2	μg/L	EPA200.8
Iron	5	μg/L	EPA200.8
Lead	0.1	μg/L	EPA200.8
Manganese	0.1	μg/L	EPA200.8
Mercury	0.01	μg/L	EPA200.8
Nickel	0.1	μg/L	EPA200.8
Zinc	5	μg/L	EPA200.8

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Taiga Batch No.:
140779

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GJO-4**

Taiga Sample ID: **003**

- DATA QUALIFIERS -

Data Qualifier Descriptions:

62 *Residual DO was less than 1 mg/L. No result available.*

*** Taiga analytical methods are based on the following standard analytical methods**

SM - Standard Methods for the Examination of Water and Wastewater

EPA - United States Environmental Protection Agency

ReportDate:

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Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-765-6645 Fax: (867)-669-2718

Taiga Batch No.:
140851

- FINAL REPORT -

Prepared For: Hamlet of Gjoa Haven

Address: P.O. Box 200
Gjoa Haven, NU
X0B 1J0

Attn: Shawn Stuckey

Facsimile: (867) 360-6309

Final report has been reviewed and approved by:

Judy Mah
Client Service Officer

NOTES:

- Test methods and data are validated by the laboratory's Quality Assurance Program. Taiga Environmental Laboratory is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) to ISO/IEC 17025 as a testing laboratory for specific tests registered with CALA.
- Routine methods are based on recognized procedures from sources such as
 - o Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF;
 - o Environment Canada
 - o USEPA
- Samples shall be kept for thirty (30) days after the final report is issued. All microbiological samples shall be disposed of immediately upon completion of analysis to minimize biohazardous risks to laboratory personnel. Please contact the laboratory if you have any special requirements.
- Final results are based on the specific tests at the time of analysis and do not represent the conditions during sampling.

ReportDate: Friday, October 10, 2014

Print Date: *Friday, October 10, 2014*

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Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

Tel: (867)-765-6645 Fax: (867)-669-2718

Taiga Batch No.:
140851

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GJO-3 (new)**

Taiga Sample ID: **001**

Client Project:

Sample Type: Water

Received Date: 23-Sep-14

Sampling Date: 22-Sep-14

Sampling Time: 9:00

Location: GJO-3 (new)

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen	93.4	0.005	mg/L	25-Sep-14	SM4500-NH3:G	
Biochemical Oxygen Demand	106	2	mg/L	24-Sep-14	SM5210:B	
Organic Carbon, Total	143	0.5	mg/L	29-Sep-14	SM5310:B	
<u>Inorganics - Physicals</u>						
Alkalinity, Total (as CaCO ₃)	526	0.4	mg/L	23-Sep-14	SM2320:B	
Conductivity, Specific (@25C)	1710	0.4	µS/cm	23-Sep-14	SM2510:B	
pH	7.72		pH units	23-Sep-14	SM4500-H:B	
Solids, Total Suspended	71	3	mg/L	02-Oct-14	SM2540:D	
<u>Major Ions</u>						
Calcium	32.5	0.1	mg/L	23-Sep-14	SM4110:B	
Chloride	189	0.7	mg/L	23-Sep-14	SM4110:B	
Hardness	192	0.7	mg/L	23-Sep-14	SM4110:B	
Magnesium	27.1	0.1	mg/L	23-Sep-14	SM4110:B	
Nitrate as Nitrogen	0.07	0.01	mg/L	23-Sep-14	SM4110:B	

ReportDate: Friday, October 10, 2014

Print Date: *Friday, October 10, 2014*

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Tel: (867)-765-6645 Fax: (867)-669-2718

Taiga Batch No.:
140851

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GJO-3 (new)**

Taiga Sample ID: **001**

Nitrite as Nitrogen	< 0.01	0.01	mg/L	23-Sep-14	SM4110:B
Potassium	38.3	0.1	mg/L	23-Sep-14	SM4110:B
Sodium	137	0.1	mg/L	23-Sep-14	SM4110:B
Sulphate	6	1	mg/L	23-Sep-14	SM4110:B

Microbiology

Coliforms, Fecal	200000	10000	CFU/100mL	23-Sep-14	SM9222:D
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Organics

Hexane Extractable Material	6.9	2.0	mg/L	09-Oct-14	EPA1664A
Oil and Grease, visible	Non-visible			27-Sep-14	Visual Exam

Trace Metals, Total

Aluminum	171	5	µg/L	29-Sep-14	EPA200.8
Arsenic	1.6	0.2	µg/L	29-Sep-14	EPA200.8
Cadmium	0.43	0.1	µg/L	29-Sep-14	EPA200.8
Chromium	1.7	0.1	µg/L	29-Sep-14	EPA200.8
Cobalt	0.9	0.1	µg/L	29-Sep-14	EPA200.8
Copper	80.5	0.2	µg/L	29-Sep-14	EPA200.8
Iron	614	5	µg/L	29-Sep-14	EPA200.8
Lead	1.5	0.1	µg/L	29-Sep-14	EPA200.8
Manganese	52.7	0.1	µg/L	29-Sep-14	EPA200.8
Mercury	0.02	0.01	µg/L	29-Sep-14	EPA200.8
Nickel	3.9	0.1	µg/L	29-Sep-14	EPA200.8
Zinc	134	5	µg/L	29-Sep-14	EPA200.8

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Taiga Batch No.:

140851

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GJO-3 (new)**

Taiga Sample ID: **001**

*** Taiga analytical methods are based on the following standard analytical methods**

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EPA - United States Environmental Protection Agency

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