Annual Report -2020

Water Licence: 3BM-TAL 1926

Hamlet of Taloyoak, NU

February 10, 2021

Submitted by:
Shah Alam, P. Eng. E.P.
Municipal Planning Engineer,
Community and Government Services
Kitikmeot Region, Cambridge Bay, Nu

ᑲᑐᑎᓗᒍ ᓄᓇᕗᑦ ᐱᕋᖅᐸᓪᓚᐊᑎᓪᓗᒍ
Building Nunavut Together
Nunavuliuqatigiingniq
Bâtir le Nunavut ensemble

ᓄᓇᓕᖕᓂ ᒐᕙᒪᒃᑯᓐᓂᓪᓗ ᐱᔨᑦᓯᕋᖅᑎᒃᑯᑦ
Department of Community and Government Services
Nunalingni Kavamatkunnilu Pivikhaqautikkut
Ministère des Services Communautaires et gouvernementaux

Taloyoak Water Licence: 3BM-TAL 1926 — Annual Report 2020

February 10, 2021

Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1L0

Attention: Richard Dwyer, Manager of Licensing

RE: 3BM-TAL 1926- Annual Report 2020, Hamlet of Taloyoak

Dear Richard,

The Hamlet of Taloyoak is pleased to submit the "**Annual Report 2020**" of water uses and sewage solid waste disposal as required and directed under the compliance of Water Licence 3BM-TAL-1926. Copies of required tests reports are included, and information are described.

The Licensee has responded to the Board providing with requested information and documents time to time including last update on December 15, 2020 with following information:

- Update information of Water Treatment Plant O&M manual and operation,
- Updated version and information of Sewage lagoon operation management,
- Update information of Solid waste facility operation and management,
- Standalone Spills Contingency Plan, and A&R plan of facilities if happened near future,
- QA/QC plan for facilities and water, sewage, and waste program monitoring

The Licensee has done sampling of water, sewage waste and solid waste leachate from pre-determined sampling stations and test results shown satisfactory remediation of parameters within allowable limits of BOD, TSS, E-coli, toxicity and trace metals as set out in compliance requirements. We have summarized those outlined in Part B through part I.

We hope that Nunavut Water Board will find this report valuable in operating the Water Licence.

Best Regards,

Shah Alam, P. Eng. E.P.
Municipal Planning Engineer,
Government of Nunavut
Community and Government Services, Kitikmeot Region, Cambridge Bay, Nu
Phone: 867-983-4156, fax: 867-983-4124, salam@gov.nu.ca<mailto:salam@gov.nu.ca>

Cc: Baba Pedersen, Resource Management Officer, CIRNAC

EXECUTIVE SUMMARY:

This Annual Report 2020 is prepared by the hamlet of Taloyoak to meet the requirements of the Municipal Water Licence 3BM-TAL 1926, Part B-I conditions to the monitoring programs as set out. This report covers the period from 01 January to 31 December 2020.

Raw water drawn from the Canso Lake through twin suction pumps and pulled to the treatment plant using two HDPE pipe housed with heat trace inside to protect water from freezing. The raw water is then treated through a series of cartridge filters of 20M –5M - 1M followed by a chlorination. Truck-fill from outside the WTP after a second chlorination to the treated supply water to resident tanks by hamlet operated water trucks. Quantity of water delivered **46,330** m3, which is within allowable limit of **70,000** m3.

Community sewage system consists of two natural cells in series connected with a submerged berm in between and configured the primary cell and secondary cell. Raw sewage collects by vacuum truck from household sewage tanks, hauls to sewage lagoon and discharge at the main cell through one of the two flutes. Raw sewage stays inside the lagoon during Oct -June for almost 9 months and receives primary treatment naturally. When thaws in summer, sewage water starts flow over the submerged berm onto the 2nd cell and finally towards wetland from secondary cell. Sample results from monitoring stations confirms compliances of parameters limits set out in the Licence and the summary results shown in the tabular Form attached.

Waste batteries, waste oil, waste paint drums and toxic products are secured inside C-cans to ship out by sealift. Non-hazardous waste disposed at the solid waste facility are managed by packing and covers with sand-gravels, and loose wastes by control burning onsite in a metal tank open one side. Site selection for the solid waste facility improvement has been reviewed and consultant is working for the design and documents. The licensee is expecting the improvement works starts in 2021-22 with CGS Capital Project. The Licensee noticed TSS value 15 mg/L for the grab sample from TAL-4 and TAL-5, whereas this value is set 25 mg/L for Final discharge location TAL-6. The Licensee has requested the Board to consider this limit minimum 45 mg/L or higher which could be reasonable to comply with the proposed improvement sewage lagoon facility. The licensee has updated the requested O&M manuals with contacts information for water treatment system, sewage waste management, Spills Contingency Plan, A&R plan for old WTP, and QA/QC plan for monitoring program with the Board on Dec 15, 2020.

The water treatment plant operation and water delivery by two water trucks to residents 7 days a week including on call after regular hours as needed. Two sewage trucks for sewage collection and deposition and 1 garbage dump truck for waste collection and deposition 7 days a week. The solid waste facility operation and maintenance carries mostly in summer-fall and minor other times as needed. The decommissioned soil remediation facility of airport authority is a good candidate for the community to consider spills and contaminated soil storage and possible treatment provided an improvement of the facility compliance with new regulations, but the hamlet does not have budget or resources to accommodate it unless a GN contribution. Some discussion happened with CGS for the benefits both for GN projects and community residents in future.

ᓴᓇᔨᒋᔭᐅᔪᑉ ᐅᖃᐅᓯᒃᓴᖏᑦ:

ᐅᑭᐅᓕᒪᕐᒧᑦ ᐅᖃᐅᓯᒃᓴᑦ 2020-ᒧ ᐊᕿᒃᓱᕐᑕᐅᔪᑦ Hᐊᒪᓚᑯᓄᑦ ᑕᓗᕐᔪᐊᓂ ᒪᓕᒋᐊᖃᑕᐅᔪᓄᑦ ᓄᓇᓕᖕᓄᑦ ᐃᒪᓕᕆᓂᕐᒧᑦ ᓚᐃᓴᑎᒍᑦ ᓇᓴᐅᑕ 3BM-TAL 1926, ᐃᓚᖓᓂ B-H ᖃᓄᐃᓐᓂᕆᔭᖏᑦ ᖃᐅᔨᓴᕐᑕᐅᓂᖏᑦ ᐊᕿᒃᓯᒪᔪᑎᒍᑦ. ᑕᑯᐊ ᐅᖃᐅᓯᒃᓴᑦ ᐅᖃᐅᓯᕆᔭᐅᓂᐊᕐᑐᑦ ᐱᒋᐊᕐᑐᑦ 01–ᒥᒃ ᓯᕿᓐᓇᐅᑦ ᑎᑭᑦᓯᒍ 31-ᒧ ᓯᕿᓐᖏᓚᕈᕙᒃ 2020.

ᐃᒥᕐᑕᖃᑕᕐᑐᑦ ᕿᖕᒥᕐᑕᓕᖕᒥᒃ ᐃᒥᕐᑕᐅᒧᑦ ᓱᓪᓗᑎᒍᑦ ᐃᒪᖃᐅᒧᑦ ᑕᑯᐊ ᓱᓪᓗᖏᑦ ᐃᑭᐊᕐᒥᖃᓯᑎᒃ ᐅᓇᕐᑐᒥᒃ ᕿᑭᕐᑕᐃᓕᑎᓂᒃ ᐃᒪᕐᒧᑦ. ᐃᒪᖅ ᓴᓕᒃᑕᐅᖃᑕᕐᑐᖅ ᓴᓕᒍᑎᓄᑦ 20M – 5M – 1M ᐊᒻᒪ ᐃᓚᔭᐅᖃᑕᕐᑐᖅ ᑐᕐᑯᓇᕐᒥᒃ. ᐃᒥᕐᑕᐅᑦ ᐃᒥᕐᑕᖃᑕᕐᑐᖅ ᓯᓚᑕᓂᒃ ᑐᓪᓕᐊᓂᒃ ᑐᕐᑯᓇᓕᕐᑕᐅᖃᓯᓂ ᐃᒥᕐᑕᕐᑕᐅᓂᐊᓴᕐᓯᑎᒃ ᐃᒡᓗᐃᑦ Hᐊᒪᓚᑯᑦ ᐊᒃᓴᓗᑎᕐᑯᑎᖏᓐᓄᑦ. ᐃᒥᕐᑕᕐᑕᐅᓂᑯᐃᑦ 46,330, ᑕᒪᓐᓇ ᐃᑦᑐᐊᕐᑐᖅ ᐃᒥᕐᑕᕈᓇᕐᒪᑕ 70,000.

ᖁᑕᑕᕐᕕᒃ ᑯᕝᕕᕕᖏᑦ ᒪᕈᓕᖓᔪᑦ ᑕᑯᐊ ᐊᑕᔪᒃ ᓯᕗᓕᕐᒧᑦ ᐊᒻᒪ ᑐᓪᓕᐊᓄᑦ. ᖁᑕᕐᑕᐅᖃᑕᕐᑐᑦ ᐃᒡᓗᐃᑦ ᐊᒃᓴᓗᑎᒧᑦ ᒥᑦᑐᐊᕈᑎᓕᖕᒧᑦ, ᑯᐱᒋᐊᕐᑐᕐᑕᐅᖃᑕᕐᑐᑦ ᖁᑕᕐᑕᕐᕕᖕᒧᑦ ᓇᓕᑐᐃᓇᓄᑦ ᑯᐱᕕᖏᓐᓄᑦ. ᖁᑕᕐᑕᐅᔪᕕᓂᑦ ᑯᐱᓗᐃᑦ ᓱᓐᓂᕐᑕᕐᑐᑦ ᐱᒋᐊᕐᓯᒍ ᐊᒥᐊᕐᓄᑦ ᑎᑭᑦᓯᒍ ᓄᓇᕕᖕᒧᑦ ᑕᕐᑭᓯᐅᑎᑦ ᖁᓚᐅᕐᒋᓄᐊᕐᑐᑦ ᐊᒻᒪ ᑕᑯᐊᖏᑦ ᐊᐅᑦᑐᕐᐸᓕᐊᕐᑕᐅᔪᑦ ᐃᖕᒥᓂᒃ. ᐊᐅᔭᑯᑦ ᐊᐅᑦᑐᖃᖓᓂ, ᖁᕕᐊᓕᐊᕐᑕᐅᔪᑦ ᐊᑕᔪ ᑐᓪᓕᐊᓄᑦ ᑕᑯᐊᖓᑦ ᓄᓇᒧᖓᕐᑕᐅᔪᑦ. ᑕᒪᓐᓇ ᓄᓇ ᖃᐅᔨᓴᕐᑕᐅᖃᑕᕐᑐᑦ ᖃᓄᐃᖏᑲᓗᐊᕐᒪᖔᖏᑦ ᑎᑎᕋᕐᓯᒪᔪᑎᒍᑦ ᒪᓕᒐᕐᓂᒃ ᒪᓕᒃᓯᑎᒃ ᓚᐃᓴᑎᒍᑦ ᐊᒻᒪ ᑕᑯᐊ ᑎᑎᕋᕐᒪᔪᑦ ᖃᐅᔨᓴᕐᑕᐅᓂᖏᑦ ᐊᑕᔪᑦ.

ᐸᑕᓕᕙᓂᑦ, ᑭᓂᕐᑕᕙᓂᑦ, ᐊᒥᐊᕐᓄᑦ ᐳᕙᓂᑦ ᐊᒻᒪ ᐅᓗᕆᐊᓇᕐᑐᑦ ᐳᕐᑕᐅᓯᒪᔪᑦ ᐅᒥᐊᕐᔪᐊᑦ ᐳᓇᖃᑕᕐᑕᖏᓐᓄᑦ ᐊᐅᓚᕐᑎᑕᐅᔪᒃᓴᑦ ᐅᒥᐊᕐᔪᐊᑯᑦ. ᐃᖁᐃᑦ ᐃᑭᑕᐅᖃᑕᕐᑐᑦ ᐃᖁᕐᕕᖕᒧᑦ ᓴᐅᔭᐅᑉᑐᑎᒃ ᐅᕙᓗᖕᓂᑦ ᑐᑉᑐᔭᐅᑉᑐᑎᒃ ᓯᐅᕋᒧᑦ – ᑐᐊᐸᖕᒧᑦ, ᐊᒻᒪ ᐃᓚᖏᑦ ᐃᑭᑕᐅᑉᑐᑎᒃ ᖃᑦᑕᐅᔭᐅᑉ ᐃᓗᐊᓂ ᓴᓂᕋᓂᒃ ᐊᖕᒪᑎᑦᑐᒍ. ᐃᖁᕐᕕᒃᓴᖕᓴᕐ ᐊᕿᒋᐊᕐᑕᐅᓂᕐᒪ ᓴᓇᔨ ᐊᕿᐃᓂᕐᒧᑦ ᖃᓄᐃᓕᐅᕐᑕᐅᓂᐊᕐᒪᖔᖏᓐᓂ ᐊᒻᒪ ᑎᑎᖃᑎᖏᑦ. ᑕᓐᓇ ᓚᐃᓯᖃᑐᖅ ᓂᕆᐅᒃᑐᖅ ᐊᕿᒋᐊᕐᑕᐅᕙᓕᕐᓂᖓᓂ ᐱᒋᐊᕐᓱᒍ 2021-22–ᒧᑦ ᑭᓇᐅᔭᓂᒃ ᑐᓂᔭᐅᓱᑎᒃ ᓄᓇᕗᑯᑦ ᒐᕙᒪᑎᒍᑦ. ᓚᐃᓯᖃᑐᖅ ᖃᐅᔨᓚᐅᕐᑐᖅ ᐃᖃᑯᐃᑦ 15 mg/L ᖃᐅᔨᓴᕐᑕᐅᔪᑦ ᑕᑯᓂᖓ TAL-4 ᐊᒻᒪ TAL-5-ᒥᒃ, ᐃᒪᐃᓪᒪᑦ ᐊᕿᒃᓯᒪᒋᐊᓕᒃ 25 mg/L ᐃᖃᑯᕐᕕᒃᓴᖅ ᐃᓂᒋᓂᐊᕐᑕᖓᓄᑦ TAL-6-ᒧᑦ. ᓚᐃᓯᐊᑐᖅ ᐊᖏᖁᔾᔭᕙᓗᐊᖅ ᑲᑎᒪᔨᓄᑦ ᐊᖏᓂᖃᑎᓪᓗᒍ 45 mg/L ᐅᕙᓗᖕᓂᑦ ᐳᕐᑐᓂᕐᓴᒥᒃ ᑕᒪᓐᓇ ᐃᑦᑐᐊᕈᓇᕐᒪᑦ ᐊᕿᒃᓯᕐᑕᐅᓕᕐᐸᑕ ᖁᑕᕐᓄᑦ ᑯᕝᕕᐅᖃᑕᕐᑐᒧᑦ. ᓚᐃᓯᖃᑐᖅ ᐊᕿᒋᐊᕐᓯᒪᔪᓂᒃ ᑕᑯᓂᖓ ᒪᓕᒋᐊᕐᑕᖏᓐᓂᒃ ᑐᖃᑎᖃᑐᓂᒃ ᐃᒪᕐᒧᑦ, ᖁᑕᕐᑕᕐᓂᕐᒧᑦ, ᐅᓗᕆᐊᓇᕐᑐᓄᑦ ᑯᐱᔪᓄᑦ, ᐱᓕᕆᔭᐅᕙᓕᐊᕐᓂᖏᑦ ᐃᒪᕐᑕᕙᓂᖏᑦ, ᐊᒻᒪ ᐱᓕᕆᔭᐅᕙᓕᐊᔪᓄᑦ ᑲᑎᒪᔨᓄᑦ ᓯᕿᓐᖏᓚᕈᕙᒃ 15, 2020–ᒥ.

ᐃᒪᓕᕆᓂᕐᒧᑦ ᐊᒻᒪ ᐃᒥᕐᑕᕐᓂᕐᒧᑦ ᒪᕈᓄᑦ ᐊᒃᓴᓗᑎᓄᑦ ᐃᒥᕐᑕᕐᑕᐅᑦ 7–ᓄ ᐅᑉᓗᓄᑦ ᐱᓇᓱᐊᕈᓯᓕᒪᕐᒥ ᐊᒻᒪ ᓴᓇᓐᓇᕈᐃᕐᑎᑦᑐᒍ ᐃᒥᕐᑕᓇᐊᖃᐸᑕ ᐃᒥᕐᑕᖃᑕᕐᑐᑦ. ᒪᕈᓂᒃ ᖁᑕᕐᑕᐅᑎᖃᑐᖅ ᐊᒻᒪ ᐊᑕᐅᓯᕐᒥᒃ ᐊᑦᑕᑯᑎᖃᑐᖅ ᓴᓇᖃᑕᕐᑐᑦ 7–ᓂᒃ ᐅᑉᓗᓂ ᐱᓇᓱᐊᕈᓯᓕᒪᕐᒪ. ᐊᑦᑕᑯᑦ ᑲᒪᒋᔭᐅᖃᑕᕐᑐᑦ ᐊᒻᒪ ᐊᕿᒋᐊᕐᑕᐅᖃᑕᕐᑐᑦ ᐱᓗᐊᕐᑐᓂᒃ ᐊᐅᔭᑯᑦ-ᐅᑭᐊᒃᓴᑯᑦ ᐊᒻᒪ ᓯᓚᐊᖏᑐᑦ ᑲᒪᒋᔭᐅᖃᕐᒥᔪᑦ ᐱᒋᐊᖃᓕᖃᕐᒪᑕ. ᓯᖃᓕᕐᓯᒪᔪᑦ ᑐᐊᐸᐃᑦ ᒥᕝᕕᖕᒧᑦ ᐊᑐᕐᑕᐅᖃᑕᕐᑐᑦ ᐊᑐᕐᑕᐅᒍᓇᕈᐊᕐᑐᑦ ᖁᕕᐊᓱᒃᑲᓚᖕᓂᕐᐸᑦ ᐅᓗᕆᐊᓇᕐᑐᓂᑦ ᐅᓗᕆᐊᓇᕐᑐᖃᓂᕐᐸᑦ ᓄᓇᐸᑎᓐᓂ ᐊᑐᕐᑕᐅᕙᓐᓇᖃᕐᔪᑦ ᑐᕐᑯᓇᕐᓯᑎᒃ ᐊᒻᒪ ᐃᒪᖅ ᑕᒪᓂ ᓴᓕᒃᑕᐅᑉᑐᑎᒃ ᓄᑕᕐᓂ ᒪᓕᕐᓂ ᑎᑎᕋᕐᒪᔪᖃᕐᒪᑦ, ᑭᓯᐊᓂ Hᐊᒪᓚᑯᑦ ᑭᓇᐅᔭᖁᑎᖃᕐᒪᑕ ᐊᐅᓚᓂᕐᓂ ᓴᓇᕈᑎᖃᕐᒪᑕ ᓴᓂᕐᓂᕐᒧᑦ ᑭᓯᐊᓂ ᑕᑯᓂᖓ ᓄᓇᕗᑯᑦ ᒐᕙᒪᖏᓐᓂ ᑭᓇᐅᔭᕐᑕᖃᐅᑎᓐᓇᖃᕐᒪᑦ. ᐅᖃᒪᔾᔭᐅᓕᕐᓂᕐᒪᑦ ᐅᑯᓄᖓ ᓄᓇᕐᑕᑎᓐᓂ ᒐᕙᒪᖕᓂᑦ ᐱᓱᑎᒥᓂᑦ ᐃᑲᔪᑕᐅᓂᐊᕐᒪᑦ ᓄᓇᕗᒥ ᒐᕙᒪᖕᓂ ᐊᒻᒪ ᓄᓇᖃᑐᓄᑦ ᓯᕗᓂᒃᓴᖓᓂ.

Part B - D: conditions of water uses and waste disposal:

- The annual water supply is accumulated from the measurement of truck fill daily basis. Quantity of raw sewage and solid waste volume accumulated from number of trucks sewage deposited in the lagoon and truck loads dumped at the solid waste on daily/weekly basis.
- No unauthorised discharge happened during this period and no modification or major works to water intake, treatment plant, sewage lagoon or solid waste facilities.
- Updated version including contact information of O&M manuals for water supply, sewage and solid waste management has been submitted on Dec 15, 2020 as requested by the Board in the Technical Review letter of Annual Report 2019.
- Monitoring program carried during summer and fall as reported and updated in QA/QC plan
- The Canso Lake is the only source of intake and the annual quantity drawn 46,300 m3 which is within the allowable daily limit 299 m3 and annual 70,000 m3 stated in the Licence.
- No erosion happened on sides slope of water intake lines, or sewage drop off flute.
- No known spills happened in the community or at the facility to be reported.
- The Licensee has received the amendment Licence 3BM-TAL 1926 and has reviewed the information noted.
- The Licensee discovered the TSS number as 15 mg/L for the grab sample from TAL-4 and TAL-5, whereas this limit is set 25 mg/L for Final discharge location TAL-6. The Licensee has requested the Board to consider this limit minimum 45 mg/L or higher.
- Raw sewage water collects from household sewage tank by hamlet operated vacuum trucks and discharged at the designated drop off point using metal flutes at lagoon main cell.
- No mechanical decanting system for the sewage system; effluent water merges from second cell onto the wetland naturally when thaws in spring and starts flow to wetland in summer.
- Final discharge point remains unchanged designated as TAL-6.

Part E-H: Modification, construction, operation, abandonment, restoration

- No new construction or modification done to water, sewage, and solid waste facilities in this period.
- Possible location identified from different options for the new lagoon cell construction. Advised the consultant to provide preliminary design and document for new sewage system development under the GN capital project and the project is moving forward.
- Solid waste facility study project completed and plan for improvement of the facility in progress. CGS hired consultant is working for the model design and document preparation, hiring a contractor may take place in FY 2021-22

Part I: Monitoring Program

Sewage & solid waste effluent monitoring stations TAL-1, TAL-2, TAL-3, TAL-4 and TAL-6 are active. Station TAL-5 is set as optional for sampling hazardous waste storage water pond when decanting needed. Station TAL-1 is set at the Canso lake shore where intake water line is placed on sloping ground.

Waste oil and empty/half full fuel drums are stored inside two C-cans on wooden crate outside the soil water pond. waste batteries are stored inside C-cans in wooden boxes and fully wrapped with plastic sheets and tied outside. The Licensee will ship out those boxes in C-cans through sealift to down south identified recipient.

ANNUAL REPORT - 2020

YEAR BEING REPORTED: 2020

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water Licence **3BM TAL 1926** issued to the **Hamlet of Taloyoak.**

.

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	4,193,820.00	same
February	3,859,729.40	Same
March	4,046,664.30	Same
April	3,947,925.70	Same
May	3,819,350.10	Same
June	3,483,089.40	Same
July	3,835,622.10	Same
August	3,917,991.40	Same
September	3,513,797.50	Same
October	3,741,675.20	Same
November	3,904,111.50	Same
December	4,065,923.60	Same
ANNUAL TOTAL	**46,329,700.20**	Same

iv. a summary of modifications and/or major maintenance work carried out on the Water Supply and Waste Disposal Facilities, including all associated structures & facilities;

Water intake and treatment System:
No effective maintenance or modification for water intake or treatment system

The water intake system is 200 mm HDPE line inside 300 mm insulated HDPE casing, two 20HP intake pumps runs by 3p power line with automatic transfer.
The filtration consists of 75M screener before the cartridge filtration 20M -1M,
Chlorination using 0.5hp pumps before filtration and before truckfill, 3p power line from main grid and two alternate energy generating facilities for the main power supply determined by:

- Wind turbine (whisper 500 battery charging system)
- Solar cell energy generating

Sewage treatment system:
Two natural lakes connected with a submerged berm is the sewage facility made up of the primary cell and a secondary cell connected to a wetland through a raised berm. Raw sewage haul from household sewage tanks using vacuum truck and deposit into the primary cell through fixed metal chutes, where raw sewage mostly stays frozen during Oct – Jun. The sewage lagoon is about 3.2 km from the community and has capacity about 35,000 m3. The wetland about 900m long enriched with seasonal vegetation, connected to lagoon secondary cell in one end and ending with Stanner Harbour (final discharge point).

Solid waste and metal dump:
Not any reportable modification or maintenance for the solid waste/metal dump
The solid waste facility is on a slopping land made up of MSW and a metal dump facility (for bulky meal and hazardous) at the higher gradient gravel-sand topography.

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

No reported unauthorized discharge of sewage or solid waste or fuel spills.

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

No abandoned or restoration work done for water or sewage lagoon facilities. The licensee is anticipating restoration of the existing sewage lagoon cell be part of the proposed new improvement lagoon system which is now planning for design by the consultant.

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;

Nunavut Water Board has requested to update the O&M manuals for water and sewage system,

SC plan for emergency, AR plan for old water system in town with a letter dated Sep 30, 2020 respond to Technical Review of Annual report 2019 9 (information in Appendix A).
The licensee has responded to the request on Dec 15, 2020 (information only attached) which is summarized as follows:

- updated O&M manual of WTP with contact information of the operator and administrative personnel, equipment, training. The O&M manual was approved with the previous submission in May 2012, but the Board has requested an updated contact information and monitoring plan.
- updated document for sewage system and contacts information of personnel for monitoring. The O&M document was approved by the Board with previous submission on August 10, 2014 and this submission included amendments of contact information and monitoring system.
- Updated document of solid waste facility monitoring, and management plan and procedure for hazardous waste which was approved by the Board with previous submission in October, 2014.
- Standalone document of updated Spill Contingency Plan, which was previously approved with the O&M manual together in August 2014.
- Information regarding the A&R plan of old Water Treatment Facility building in town which is empty and not uses for any other purposes. The old intake line utilidor is also disconnected and remains buried at location with access roads crossed over. Power Corporation facility has been moved to new building which used to share this building. The Licensee has initiated few times to fully demolish the building and unused water tanks, pipes, and accessories, but could not do so due to lack of funding and budget restriction.

- The licensee has received approval of the previously submitted QA/QC plan for long time uses annually mostly May-Sep for Sewage and waste facilities and sampling stations.

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

CGS has completed the feasibility study of the Solid waste facility together with Gjoa Haven under one contract. The study report has suggested for improvement of the existing facility or a new one considering most cost-effective operational scope.

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

Updated version of O&M manuals for water treatment plant and sewage waste facilities were submitted to the Board on Dec 15, 2020 as seen in item # vii above

ANNUAL REPORT

X ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

Taloyoak wastewater improvement project is in planning and design selection process under the CGS capital funding. The possible site location has been determined with schematic design options to go for final design and documents for hiring contractor which is expected start in spring-summer 2021.

The hamlet has procured a stage platform for water truck operator safely standing and climb up while filling water truck. This addition became essential as noted by Safety officer of WSCC. Installation is delayed for collecting some missing nuts to place the step platform on safe ground and supported.
The hamlet also planning to prepare an burning incinerator using a metal drum on site as suitable candidate with good size and shape.

Xi FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

The CIRNAC inspector has visited facilities on Aug 13, 2020 with the CGS Municipal Planning Engineer and has addressed some items to take in consideration as follows:
C-cans at site are full of waste oil drums needs to send out by Sealift or repurpose or burn on site using control burning device.

- *The hamlet is planning to get an oil burner device to burn waste oil on site.*

Missing signs at Sewage lagoon facility, effluent final discharge station TAL-6 and water intake station TAL-1 are to be reinstalled.

- *All those signages were re-installed by locations as identified*.

Bags of contaminated soil are placed along the berm of the decommissioned Soil Land farm of the Arctic airport authority which can be included to the upcoming Solid Waste improvement project.

- *The licensee has proposed this scope be included to the Solid Waste improvement project.*

Used batteries are stored in C-cans on wooden crate outside of hamlet garage. The licensee needs to store all other used batteries from resident or public similar way and plan to ship out to the right recipient.

- *The licensee has placed wooden boxes on site for public waste batteries storage.*

Appendix A:

Water, sewage & waste sample results 2020

Water Licence: 3BM-TAL 1926

Hamlet of Taloyoak, NU

2020 Taloyoak Water Sewage Effluent Log

Parameters	Units	Guideline MAC Limits	WL set Limits at TAL-3	WL set Limits at TAL-6	23-Jul-20		
					Tal-1	Tal-3	Tal-6
Alkalinity	mg/L				205	192	54.1
Conductivity	µS/cm				805	773	170
pH	pH	6-9	6-9	6-9	7.73	8.03	9.25
TSS	mg/L	180	180	25	26	40	10
Ammonia as N_2	mg/L				1.66	6.67	<0.005
BOD	mg/L	120	120		19	33	4
CBOD	mg/L				15	29	4
Dissolved, C	mg/L						
Total, C	mg/L				23.0	39.7	15.3
Nitrate as N_2	mg/L	45				0.297	<0.0200
Nitrite as N_2	mg/L	3				0.506	<0.0100
Calcium	mg/L	32			61.8	49.2	15.6
Chloride	mg/L	100			84.8	99.1	16.9
Hardness	mg/L	500			273	217	62.8
Magnesium	mg/L				28.8	22.9	5.81
Potassium	mg/L				7.38	12.6	1.42
Sodium	mg/L	200			57.9	65.7	9.55
Sulphate	mg/L	500			68.6	34.0	3.32
Fecal Coliform	CFU/100mL	$1x10^6$	$1x10^6$		<100	200	<1
Oil & Grease	Visibility	Non-Visible	Non-Visible	Non-Visible	Non-visible	Non-visible	Non-visible
Benzene	mg/L				<0.00050	<0.0050	<0.00050
Ethylbenzene	mg/L				<0.0050	<0.00050	<0.00050
Toulene	mg/L				<0.00050	<0.00050	<0.00050
Xylenes	mg/L				<0.00050	<0.00050	<0.00050
F2: C10-C16	mg/L				<0.10	<0.10	0.17
F3: C16-C34	mg/L				<0.25	<0.25	<0.25
F4: C34-C50	mg/L				<0.25	<0.25	<0.25
Aluminium	µg/L	200		1	27.5	31.7	20.2
Arsenic	µg/L	25		1	0.9	1.2	2.2
Cadmium	µg/L	5		0.1	<0.1	<0.1	<0.1
Chromium	µg/L	50		0.1	0.2	0.2	<0.1
Cobalt	µg/L	50			0.2	0.3	0.1
Copper	µg/L	200			2.4	6.7	1.0
Iron	µg/L	500		1	230	119	351
Lead	µg/L	10		0.05	<0.1	0.1	0.2
Manganese	µg/L	50			24.9	33.1	10.1
Mercury	µg/L				0.01	0.01	<0.01
Nickel	µg/L	200			0.9	1.3	0.4
Zinc	µg/L	500		0.5	<5.0	6.4	13.4
Phenol, Total	µg/L				<0.0010	<0.0010	<0.0010

Appendix B:

Update of O&M manuals and information

Water Licence: 3BM-TAL 1926

Hamlet of Taloyoak, NU

ᑲᑐᑎᓗᒍ ᓄᓇᕗᑦ ᐱᕙᓪᓕᐊᑎᓪᓗᒍ
Building Nunavut Together
Nunavuliuqatigiingniq
Bâtir le Nunavut ensemble

ᓄᓇᓕᖕᓂ ᑲᕙᒪᑦᑯᓐᓂᓗ ᐱᕕᒃᓴᖅᑎᒃᑯᑦ
Department of Community and Government Services
Nunalingni Kavamatkunnilu Pivikhaqautikkut
Ministère des Services Communautaires et gouvernementaux

Water Licence: 3BM-TAL 1926 **Respond to Technical Review 2019 Annual Report**

December 15, 2020
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1L0
Attention: Sergey Kuflevskiy, Technical Advisor, Nunavut water Board

RE: Respond to Technical Review of Annual Report 2019 for Water Licence 3BM-TAL 1926

Dear Sergey,

We are pleased to submit our explanation to your request on the above subject matters in conjunction to the approved water Licence 3BM-TAL 1926 which requires some clarification update. We apologize in sending this explanation in a later date than that was expected in your letter dated September 30, 2020.

we are summarizing our explanation and submission by items as requested:

1. Part F, Item 1 of Water licence: to update contacts and information in Water System O&M manual
   - Please find the enclosed updated O&M manual of WTP with contact information inside
2. Part F, item 2 of Water Licence: to update contacts and monitoring program of sewage system
   - Please find enclosed information documents for sewage system and contacts updates
3. Part F, Item 3 of water Licence: to update management plan and monitoring program of solid waste
   - please find enclosed documents of updated solid waste facility monitoring information
4. Part G, Item 1 of water licence: develop a standalone Spill Contingency Plan
   - please find enclosed documents of updated Spill Contingency Plan
5. Part H, Item 4, approved A&R plan for old Water Treatment Facility
   - Please note that the old Water Treatment Facility building in town is empty and not uses for any other purposes. The old intake line utilidor is also disconnected and remains buried at location where access roads cross over.
   - Power Corporation facility has been moved to new building which used share this building.
   - The Licensee has initiated few times to fully demolish the building and unused water tanks, pipes, and accessories, but could not do so due to lack of funding and budget restriction.
   - The building is not in use or affecting other facilities or road, but the licensee will continue request GN for support to demolish the building and accessories with a contribution.
6. Part I, item 1: updated version of QA/QC plan to ensure constancy with Monitoring Program
   - The licensee has received approval of the previously submitted QA/QC plan for long time uses annually mostly May-Sep for Sewage and waste facilities and sampling stations.

P.O. Bag 200, Helen Maksagak Centre
Cambridge Bay, Nunavut X0B 0C0
(867) 983 4156 (867) 983 4123
www.gov.nu.ca

- Facilities maintenance and operations are yearly program as needed and no limitations. Therefore, no changes at this time of the previously submitted and approved QA/QC plan, unless a changeover of the program or facility which can be happened once the proposed new Sewage Facility and new Sold waste facility is developed. The GN CGS has active projects for both these two programs and a study phase has been completed towards a Design stage, expected a construction contract in 2021-22 for both projects.

7. Part D, Item 8: Effluent Quality Standard at Final Discharge point TAL-6

The licensee has determined that strict limits were set for CBOD and TSS at station TAL-6:

- CBOB:25 mg/L, and TSS: 25 mg/L; compliance requirements for Final Discharge

Whereas,

- BOD: 120 mg/L, and TSS: 180 mg/L for TAL-3 of the sewage lagoon shown in the licence.

We request the Board to consider these limiting values to at least 45 mg/L or higher in consistence with other communities Water Licenses in Nunavut.

We hope that Nunavut Water Board will find effective explanation and information requested in the latter dated Sep 30, 2020 (attached)

Best Regards,

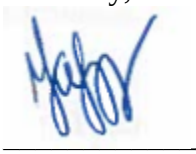
Shah Alam, P. Eng.

Municipal Planning Engineer,
Government of Nunavut
Community and Government Services
Kitikmeot Region, Cambridge Bay, Nu
Phone: 867-983-4156, fax: 867-983-4124, salam@gov.nu.ca

The Licensee is requested to submit to the Board all outstanding information listed above, or an explanation as to why it was missing along with the timeline advising when these outstanding submissions will be provided to the NWB, within sixty (60) days from the issuance of this letter.

Should you have any questions, please feel free to contact the undersigned at (867) 360-6338 (extension 29) or sergey.kuflevskiy@nwb-oen.ca, at your earliest convenience.

Sincerely,



Sergey Kuflevskiy
Technical Advisor
NUNAVUT WATER BOARD

Cc: Distribution List – Kitikmeot

Appendix C:

CIRNAC inspection Report 2020

Water Licence: 3BM-TAL 1926

Hamlet of Taloyoak, NU

WATER LICENCE INSPECTION FORM

☒ **Original**
☐ **Follow-Up Report**

Licensee	**Licensee Representative**
Hamlet of Taloyoak	David Irqiut
Licence No. / Expiry	**Representative's Title**
3BM-TAL1926	Assistant Senior Administrative Officer
Land / Other Authorizations	**Land / Other Authorizations**
Date of Inspection	**Inspector**
2020 August 13	Baba Pedersen

Activities Inspected

☐ Camp ☐ Drilling ☐ Mining ☐ Construction ☐ Reclamation ☐ Fuel Storage
☐ Roads/Hauling ☐ Other: ☒ Other: Municipal

Conditions: **A - Acceptable** **C - Concern** **U - Unacceptable** **NA – Not Applicable** **NI – Not Inspected**

Water Use	Condition	Comment	**Site Conditions**	Condition	Comment	**Haz/Mat Management**	Condition	Comment
Intake/Screen			Water Management Structures			Storage	A	7
Flow Measure. Device	A	9	Culverts / Bridges			Spills		
Source:			Drainage			Spill Plan		
Water Use:			Erosion / Sediment					
Recirculation (y /n)			Mitigation Measures			**Administrative**		
			Reclamation Activities	U	8	Records	A	9
			Materials Storage			Reports	A	10
Waste Disposal			Signage	C	3 & 6	Plans	NA	1
Waste Water	A	4				Notifications		
Solid Waste	A	5	**Monitoring**			**Other**		
Hazardous Waste	A	2	Sample Collection / Analysis	A	4			

**The number in the comments field will correspond with specific comments provided below.*

Samples taken by Inspector:	Location(s):
☐ Yes ☒ No	

SECTION 1 ☒ **Comments** (s.__) ☐ **Non-Compliance with Act or Licence** (s.__) ☐ **Action Required** (s.__)

On Thursday August 13, 2020, I Baba Pedersen, Resource Management and Water Resources Officer with Crown-Indigenous Relations and Northern Affairs Canada, the Writer of this Report, did Inspect the holder (Hamlet of Taloyoak) of Water Licence number 3BM-TAL1926 issued for the Municipal Use of Water and Waste Disposal in the Hamlet of Taloyoak in the Kitikmeot Region of Nunavut.

The Inspector was accompanied by Shah Alam, Municipal Planning Engineer from the GN-CGS and Jerome Kripanik with the Hamlet of Taloyoak. The Site Inspections were preceded by a meeting in the offices of the Hamlet of Taloyoak that also included David Irqiut, Assistant Senior Administrative Officer for the Hamlet of Taloyoak

SECTION 2 ☒ **Comments** ☐ **Non-Compliance with Act or Licence** ☐ **Action Required**

During the Site Inspections, the following was observed by the Inspector;

1. Arctic Airports two Contaminated Soil Bermed Areas
2. Used Oil Storage Area (Photos 1 & 2)
3. Sewage Lagoon Wetlands Access Area (Photo 3)
4. Sewage Lagoon Wetlands Area (Photo 4)
5. Garbage Dump (Photo 5)
6. Water Intake and Pump House (Photo 6)
7. Used Battery Storage Area (Photo 7)
8. Old Pump House/Utilidor (Photos 8, 9 & 10)
9. YTD Water Consumption Records showing 27,186 cubic meters from January 1, 2020 to July 31, 2020 were provided to the Inspector
10. The Licence Holder has submitted the Annual Report to the Nunavut Water Board

SECTION 3 ☐ **Comments** ☐ **Non-Compliance with Act or Licence** ☒ **Action Required**

1. The Licence Holder will work with the GN CGS to try and acquire the two Arctic Airports Contaminated Soil Bermed Areas as part of the planned Garbage Dump Expansion Project
2. The Licence Holder has 1 full Sea Can full of Used Oil Drums and another 80 Drums sitting adjacent to the Sea Can awaiting funding to send them all south on a Sea Lift for proper Disposal
3. The Sewage Lagoon Signage has been removed and MUST be re-installed
4. The Licence Holder has taken the required Samples about 2 weeks prior to this Inspection and sent them to the Taiga Lab in Yellowknife, NT for analysis. Once the results are received, the Licence Holder will email the results to the Inspector

5. The Licence Holder maintains adequate segregation, a routine Burn Program and routine Maintenance within the Garbage Dump Area. The Inspector has no concerns in this area at this time
6. The TAL-1 Signage has been Removed and MUST be re-installed
7. The Licence Holder has Crated and Stored their own stock of Used Batteries very nicely. Going forward, the Inspector has directed the Licence Holder to do the same with the Public's Used Batteries stored within the Garbage Dump Area
8. The Inspector has brought up the requirement for the Licence Holder to work with the GN CGS to Remove and Reclaim the old Water Intake Pump House and Utilidor System in numerous previous Inspection Reports. The claim of a lack of funding to carry out the required Reclamation is neither adequate nor acceptable. The Licence Holder MUST find appropriate funding and complete Reclamation of the old Water Intake Pump House and Utildor System PRIOR TO July 31, 2021 or the Inspector may have to consider further Enforcement Action
9. The Licence Holder is within allowable limits and the Inspector has no concerns with this at this time
10. Thank you for this, the Inspector has no concerns with this

Licensee or Representative	**Inspector's Name**
	Baba Pedersen
Signature	**Signature**
	Signed Original on File
Date	**Date**
	2020 October 21

Office Use Only:	Follow-up report to be issued by Inspector	☐ Yes	☒ No

cc. CIRNAC, Manager Field Operations, Iqaluit, justin.hack@canada.ca

Nunavut Water Board, Manager of Licensing, Gjoa Haven, licensing@nwb-oen.ca

Gov't of Nunavut, Municipal Engineer, Cambridge Bay, salam@gov.nu.ca

PHOTO LOG

Date	Camera	Inspector	Authorization
2020 August 13	Sony DSC-HX50V	Baba Pedersen	3BM-TAL1926

Photo Log # DSC06119

Photo 1

Description: Used Oils Crated and awaiting Shipment South for proper Disposal – View 1

Photo Log # DSC06122

Photo 2

Description: Used Oils Crated and awaiting Shipment South for proper Disposal – View 2

Photo Log # DSC06131

Photo 3

Description: The Sewage Lagoon Signage at the Access Area has been Removed and MUST be Re-installed

Photo Log # DSC06129

Photo 4

Description: Sewage Lagoon Wetlands Area – No Concerns here

Photo Log # DSC06155

Photo 5

Description: Garbage Dump showing adequate Segregation and Routine Maintenance – Thank you

Photo Log # DSC06162

Photo 6

Description: Signage for Sample Station TAL-1 at the Water Intake and Pump House Location has been Removed and MUST be Re-installed

Photo Log # DSC06181

Photo 7

Description: Used Batteries well Crated waiting for Shipment South for proper Disposal

Photo Log # DSC06186

Photo 8

Description: Old Pump House and Utilidor System requiring Reclamation – View 1

Photo Log # DSC06189

Photo 9

Description: Old Pump House and Utilidor System requiring Reclamation – View 2

Photo Log # DSC06196

Photo 10

Description: Old Pump House and Utilidor System requiring Reclamation – View 3

Appendix D:

Pages from Water Licence 3BM-TAL 1926

Condition of compliances, Part (B-I)

Hamlet of Taloyoak, NU

File No.: **3BM-TAL1926**

December 06, 2019

Janice Anderson
Senior Administrative Officer
Hamlet of Taloyoak
P.O. Box 8, Taloyoak, NU
X0B 1B0

Email: sao@taloyoak.ca

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

Email: salam@gov.nu.ca

RE: NWB Amendment Renewal Water Licence No. 3BM-TAL1926

Dear Ms. Anderson and Mr. Alam:

Please find attached Licence No. **3BM-TAL1926** issued to the Hamlet of Taloyoak by the Nunavut Water Board (NWB or Board) 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 Agreement*). The terms and conditions of the attached Licence related to the use of Water and the deposit of Waste are an integral part of this approval.

If the Licensee contemplates the continuing of this Undertaking after the Water Licence expires, it is the responsibility of the Licensee to apply to the NWB for a renewal Water Licence. 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 the use of Water and deposit of Waste 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 (NWNSRTA)*. However, the expiry or cancellation of a licence does not relieve the holder from any obligations imposed by the licence. The NWB recommends that an application for the renewal of this Licence be filed at least **three (3) months** prior to the Licence expiry date. It should be noted that in accordance with Section 75(1)(a) of the *Nunavut Planning and Project Assessment Act* (*NuPPAA*), the Board is not allowed to issue a permit or authorization for any project proposal that has not been submitted to the Nunavut Planning Commission (NPC) in accordance with Section 76 of *NuPPAA*.

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 from Crown-Indigenous Relations and Northern Affairs (CIRNA) on issues identified. This information is attached for your consideration.[1]

Sincerely,

Lootie Toomasie
Nunavut Water Board
Chair

LT/sk/kc

Enclosure: Amendment Renewal Licence No. **3BM-TAL1926**

Comments – CIRNA

Cc: Distribution List – Kitikmeot

[1] Email from G. Okonkwo, CIRNA, to K. Carter, NWB, Re: Application Acknowledgement for the Hamlet of Taloyoak Project – CIRNAC Comments on the Water Licence 3BM-TAL Renewal Application, November 25, 2019.

NUNAVUT WATER BOARD
WATER LICENCE AMENDMENT RENEWAL

Licence No. 3BM-TAL1926

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 TALOYOAK

(Licensee)

P.O. BOX 8, TALOYOAK, NU X0B 1B0

(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-TAL1926 / TYPE "B"**
Water Management Area:	**RASMUSSEN/GULF OF BOOTHIA WATERSHEDS (33/34)**
Location:	**HAMLET OF TALOYOAK** **KITIKMEOT REGION, NUNAVUT**
Classification:	**MUNICIPAL UNDERTAKING**
Purpose:	**DIRECT USE OF WATER AND DEPOSIT OF WASTE**
Quantity of Water use not to Exceed:	**70,000 CUBIC METRES PER ANNUM** **OR 299 CUBIC METRES PER DAY**
Effective Date:	**DECEMBER 08, 2019**
Expiry of Licence:	**DECEMBER 07, 2026**

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

Lootie Toomasie
Nunavut Water Board, Chair

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. Quantity of freshwater (in cubic metres per month and per year) obtained from all sources;
b. Quantity of each and all Waste discharged (in cubic metres per month and per year), including the hazardous and non-hazardous Waste accepted at the Solid Waste Disposal Facility;
c. Tabular summaries of all data generated under the "Monitoring Program";
d. Summary of modifications to the "Monitoring Program" in accordance with Part I, Item 14;
e. List of unauthorized discharges and summary of follow-up actions taken;
f. Summary of modifications and/or major maintenance work carried out on the Water Supply and Waste Disposal Facilities, including all associated structures and facilities;
g. Any updates or revisions for manuals and plans *(i.e., Operations and Maintenance, Abandonment and Restoration, QA/QC)* as required by changes in operation and/or technology;
h. Summary of any studies, reports, and plans requested by the Board that relate to Water use, Waste disposal, or reclamation, and a brief description of any future studies planned;
i. Summary of any Abandonment and Restoration work completed during the year and an outline of any work anticipated for the following year;
j. 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 I, Item 3.

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, for all Plans and Manuals submitted under this Licence, implement the Plans and Manuals as approved by the Board.

8. Every Plan and Manual to be carried out pursuant to the terms and conditions of this Licence shall become a part of this Licence, and any additional terms and condition imposed upon approval of a Plan and/or Manual by the Board become part of this Licence. All terms and conditions of the Licence should be contemplated in the development of a Plan and/or Manual where appropriate.

9. The Licensee shall, for all Plans, Manuals, and Reports submitted under this Licence, include a proposed timetable for implementation. Plans, Manuals, and Reports submitted, cannot be undertaken without subsequent written Board approval and direction. The Board may alter or modify a Plan or Manual if necessary to achieve the legislative objectives and will notify the Licensee in writing of acceptance, rejection or alteration of the Plan and/or Manual.

10. The Licensee shall review the Plans and Manuals referred to in this Licence, as required by changes in operation and/or technology, and modify the Plans and Manuals accordingly. Revisions to the Plans and Manuals shall be submitted in the form of an Addendum to be included with the Annual Report.

11. The Licensee shall immediately report 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, to the NWT/NU 24-Hour Spill Line at (867) 920-8130 and to the Inspector at (867) 975-4295.

12. The Licensee shall ensure a copy of this Licence is maintained at the Municipal Office at all times. Any communication with respect to this Licence shall be made in writing to the attention of:

(a) Manager of Licensing:
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0
Telephone: (867) 360-6338
Fax: (867) 360-6369
Email: licensing@nwb-oen.ca

(b) Inspector Contact:
Manager of Field Operations, CIRNA
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 an 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*.

16. The expiry or cancellation of this Licence does not relieve the Licensee from any obligation imposed by the Licence, or any other regulatory requirement.

PART C: CONDITIONS APPLYING TO WATER USE

1. The Licensee shall obtain all potable Water required for the Water Supply Facility and all other purposes from Canso 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 seventy thousand (70,000) cubic metres per year, and shall not exceed 299 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 an 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 otherwise 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 during the operation to prevent entry of sediment into Water.

9. 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.

PART D: CONDITIONS APPLYING TO WASTE DISPOSAL

1. The Licensee shall direct all municipal Sewage generated by the Hamlet of Taloyoak to the Sewage Disposal Facility, or as otherwise approved by the Board in writing.

2. The Licensee shall provide notice to an Inspector at least ten (10) days prior to initiating any decant of the Sewage Disposal Facility and Hazardous Waste Storage Cell.

3. All Effluent discharged from the Sewage Disposal Facility at Monitoring Program Station TAL-3 shall not exceed the following Effluent quality limits:

Parameter	Units	Maximum Concentration of any Grab Sample
pH	–	6 – 9
Fecal Coliform	CFU/100mL	1×10^6
BOD_5	mg/L	120
Total Suspended Solid	mg/L	180
Oil and Grease	mg/L	No visible sheen

4. All Effluent discharged from the Solid Waste Disposal Facilities, Run-off from Hazardous Waste Storage Cell at Monitoring Program Stations TAL-4 and TAL-5, respectively, shall meet the following effluent quality standards:

Parameter	Units	Maximum Concentration of any Grab Sample
pH	–	6 – 9
Total Suspended Solid	mg/L	15

Oil and Grease	mg/L	No visible sheen
Aluminum	mg/L	1
Arsenic	mg/L	1
Barium	mg/L	1
Cadmium	mg/L	0.1
Chromium	mg/L	0.1
Iron	mg/L	1
Lead	mg/L	0.05
Zinc	mg/L	0.5

5. A freeboard 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 for all dams, dykes or other structures intended to contain, withhold, divert or retain Water or Wastes.

6. The Sewage Disposal Facility shall be maintained and operated to the satisfaction of an Inspector and in such a manner as to prevent structural failure.

7. The Licensee shall provide to the Board for approval, prior to the commissioning of the Enhanced Wetland Treatment Area as an integral component of the sewage treatment or within ninety (90) days of completion, whichever occurs first, a Wetland Treatment Area assessment that includes, but is not limited to:

   i. Location of the Final Discharge Point required to complete monitoring requirements under Part D, Items 8 and 9;

   ii. Ecological/vegetative assessment of the area to be used, including a prediction of the time required to achieve the effluent quality as described in the Application for Water Licence renewal;

   iii. Description of the gradient, holding capacity, and verification of the total area utilized, which has been predicted as required to attain the proposed effluent quality, describing any discrepancies and the affects it will have on the predictive model outcome along with contingencies.

8. All effluent discharged from the Wetland Treatment Area Final Discharge Point, at Monitoring Program Station TAL-6 shall meet the following Effluent quality standards:

Parameter	**Units**	**Maximum Concentration of any Grab Sample**
pH	–	6 – 9
Fecal Coliform	CFU/100mL	1×10^4
CBOD	mg/L	25
Total Suspended Solid	mg/L	25
Un-ionized Ammonia (NH_3)	mg/L	1.25, as nitrogen (N) at 15°C ± 1°C
Oil and Grease	mg/L	No visible sheen

9. All Effluent discharged from the Wetland Treatment Area Final Discharge Point at Monitoring Program Station TAL-6 shall be demonstrated to be Not Acutely Toxic under the following tests to be conducted once annually approximately mid-way through discharge:

    i. Acute lethality to Rainbow Trout, *Oncorhynchus mykiss* (as per ECCC's Environmental Protection Series Biological Test Method EPS/1/RM/13).

10. The Licensee shall dispose of and permanently contain all solid Wastes generated by the Hamlet under this Licence at the Solid Waste Disposal Facility or as otherwise approved by the Board in writing.

11. The Licensee shall segregate and securely store all hazardous materials and/or hazardous Waste, including Waste oil, within the Solid Waste Disposal Facility in such a manner as to prevent the deposit of deleterious substances into any Water and until such time that proper disposal arrangements are made.

12. The Licensee shall implement measures to prevent hazardous materials and/or leachate from the Solid Waste Disposal Facility from entering Water.

13. The Licensee shall implement measures to control wind-blown litter at the Solid Waste Disposal Facility.

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

PART E: CONDITIONS APPLYING TO MODIFICATIONS AND CONSTRUCTION

1. The Licensee shall submit to the Board for approval, for construction design drawings stamped 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 Waste.

2. The Licensee may, without written consent from the Board, carry out Modifications to the Water Supply and Waste Disposal Facilities provided that such Modifications are consistent with the terms of this Licence and the following requirements are met:

    a. the Licensee has notified the Board in writing of such proposed Modifications at least sixty (60) days prior to beginning the Modifications;
    b. 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. Modifications, for which all of the conditions referred to in Part E, Item 2, 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 as-built plans and drawings stamped by an Engineer, providing explanation to reflect any deviations from for construction drawings and taking into account construction and field decisions and how they may affect the performance of the 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 at a minimum distance of thirty-one (31) metres from the ordinary High Water Mark in such a fashion that they do not enter the Water.

8. The construction or disturbance of any stream/lake bed or banks of any definable Water course are not permitted, unless authorized by the Board in writing.

9. The Licensee shall use fill material for construction, operation and maintenance only from approved sources that have been demonstrated, by appropriate geochemical analyses, to not produce acid rock drainage and to be non-metal leaching and free of contaminants.

10. The Licensee shall submit to the Board for approval, sixty (60) days prior to the initiation of any quarrying activities, a Quarry Management Plan that includes the following:

    a. Confirmation that the quarry material does not produce acid rock drainage and is non-metal leaching;
    b. An assessment of any potential impacts to freshwater quality; and
    c. Mitigation measures.

PART F: CONDITIONS APPLYING TO OPERATIONS AND MAINTENANCE

1. The Licensee shall implement the Manual entitled *"Operation and Maintenance Manual for the Water Treatment Plant at Taloyoak, Nunavut", dated May 2012* that was approved by the Board with the issuance of the previous Water Licence. The Licensee shall submit an updated version of this Manual for Board review with the 2019 Annual Report to take into consideration, at a minimum, the requirements imposed by the previous Water Licence, such as updated contact information.

2. The Licensee shall implement the Plan entitled *"Hamlet of Taloyoak, Nunavut, Sewage Treatment Facility Operation and Maintenance (O&M) Plan", dated August 10, 2014* that was approved by the Board with the issuance of the previous Water Licence. The Licensee shall submit an updated version of this Plan for Board review with the 2019 Annual Report to take into consideration, at a minimum, the requirements imposed by the previous Water Licence, such as making the Plan consistent with the Licence Monitoring Program requirements and updating contact information.

3. The Licensee shall implement the Plan entitled *"Hamlet of Taloyoak, Nunavut, Solid Waste Facility Operation and Maintenance (O&M) Plan", dated October 24, 2014* that was approved by the Board with the issuance of the previous Water Licence. The Licensee shall submit an updated version of this Plan for Board review with the 2019 Annual Report to take into consideration, at a minimum, the requirements imposed by the previous Water Licence, such as making the Plan consistent with the Licence Monitoring Program requirements and providing detailed management plan and procedures regarding the Hazardous Waste.

4. The Licensee shall review the Manuals and Plans referred to in this Part as required by changes in operation and/or technology and modify accordingly. Revisions are to be submitted in the form of an Addendum to be included with the Annual Report, unless directed otherwise by the Board or an Inspector.

5. An inspection of all engineered facilities related to the management of Water and Waste shall be carried out at least annually, in July or August, by an Engineer (Civil, Municipal or Geotechnical). The Engineer's report shall be submitted to the Board within sixty (60) days of the inspection, including a cover letter from the Licensee outlining an implementation plan to address each of the Engineer's recommendations.

6. The Licensee shall perform more frequent inspections of the engineered facilities at the request of an Inspector.

PART G: CONDITIONS APPLYING TO SPILL CONTINGENCY PLANNING

1. The Licensee shall develop a standalone *Spill Contingency Plan* and submit it to the Board for approval in writing with the 2019 Annual Report.

2. The Licensee shall prevent any chemicals, petroleum products or Wastes associated with the activities under this Undertaking from entering Water. All Sumps and fuel caches shall be located at a distance of at least thirty-one (31) metres from the ordinary High Water Mark of any adjacent Water body and inspected on a regular basis.

3. The Licensee shall conduct any equipment maintenance and servicing in designated areas and shall implement special procedures (such as the use of drip pans) to manage motor fluids and other Waste and contain potential spills.

4. If, during the term of this Licence, an unauthorized discharge of Waste occurs, or if such a discharge is foreseeable, the Licensee shall:

    a. employ the appropriate contingency measures outlined in the Spill Contingency Plan referred to in Part G, Item1; take whatever steps are immediately practicable to protect human life, health and the environment;
    b. report the incident immediately to the NWT/NU 24-Hour Spill Line at (867) 920-8130 and to the Inspector at (867) 975-4295; and
    c. for each spill occurrence, submit to the Inspector, within thirty (30) days after initially reporting the event, a detailed report that provides the necessary information on the location (including the GPS coordinates), initial response action, remediation/clean-up, status of response (ongoing, complete), proposed disposal options for dealing with contaminated materials and any preventative measures to be implemented.

5. The Licensee shall, in addition to Part G, Item 4, regardless of the quantity of releases of harmful substances, report to the NWT/NU 24-Hour Spill Line if the release is near or into a Water body.

PART H: CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION

1. The Licensee shall submit to the Board for approval in writing, an Abandonment and Restoration Plan at least six (6) months prior to abandoning any facilities or upon submission of the final design drawings for the construction of new facilities to replace existing ones. Where applicable, the Plan shall include information on the following:

    a. Water intake facilities;
    b. Water treatment and Waste disposal sites and facilities;
    c. Petroleum and chemical storage areas;
    d. Any site affected by Waste spills;
    e. Leachate prevention;

f. Implementation schedule;
g. Maps delineating all disturbed areas, and site facilities;
h. Stream crossings;
i. Consideration of altered drainage patterns;
j. Type and source of cover materials;
k. Future use of affected area;
l. Hazardous Wastes; and
m. Proposal identifying measures by which restoration costs will be financed by the Licensee upon abandonment.

2. If the Plan referred to in Part H, Item 1 is not approved, the Licensee shall make the necessary revisions and resubmit the Plan within thirty (30) days following notification from the Board.

3. The Licensee shall complete all restoration work within the time schedule specified in the Plan, or as subsequently revised and approved by the Board.

4. The Licensee shall submit to the Board for approval an *Abandonment and Restoration (A&R) Plan for the old Water Treatment Facility* with the 2019 Annual Report.

5. The Licensee shall practice progressive reclamation of the abandoned quarry in accordance with the restoration guidelines outlined in INAC's document entitled *Environmental Guidelines for Pits and Quarries*, 2010.

6. For site reclamation purposes, the Licensee shall salvage topsoil during any construction activities, for future restoration of the site to promote re-vegetation.

7. 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.

8. Areas that have been contaminated by hydrocarbons from normal fuel transfer procedures shall be reclaimed to meet objectives as outlined in the *Government of Nunavut's Environmental Guideline for Site Remediation, 2010.* 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 I: CONDITIONS APPLYING TO THE MONITORING PROGRAM

1. The Licensee shall implement the Plan entitled *"Hamlet of Taloyoak Quality Assurance/ Quality Control (QA/QC) Plan", dated August 2013* that was approved by the Board with the issuance of the previous Water Licence. The Licensee shall submit an updated version of this Plan for Board review with the 2019 Annual Report to ensure consistency with the Monitoring Program Stations listed in Part I, Item 2.

2. The Licensee shall maintain Monitoring Program Stations at the following locations and implement the following Program:

Monitoring Station ID	Description	Frequency	Status
TAL-1	Raw Water intake at Canso Lake	Volume Daily, Monthly and Annually	Active (Volume)
TAL-2	Raw Sewage from pump-out truck	Volume Daily, Monthly and Annually	Active (Volume)
TAL-3	Effluent Discharge from Lagoon to the Wetland area	Water Quality Monthly (June/July to August/September)	Active (Water Quality)
TAL-4	Run-off from the Solid Waste Disposal Facility	Water Quality Annually during periods of run-off or seepage	Active (Water Quality)
TAL-5	Hazardous Waste Storage Cell Run-off Retention	Water Quality Prior to decanting	Active (Water Quality)
TAL-6	Effluent Final Discharge Point from Wetland area to Ocean	Water Quality Monthly (June/July to August/September)	Active (Water Quality)

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

4. The Licensee shall measure and record, in cubic metres, the daily, monthly and annual quantities of raw sewage offloaded from trucks for all purposes, at Monitoring Program Station TAL-2, and the number of days the Sewage Lagoon was in use.

5. The Licensee shall sample Water quality at Monitoring Program Station TAL-3 once at the beginning, middle and near the end of discharge. Samples shall be analyzed for the following parameters:

Biochemical Oxygen Demand – BOD_5	Faecal Coliforms
Total Suspended Solids	pH
Conductivity	Nitrate-Nitrite
Oil and Grease (visual)	Total Phenols
Magnesium	Calcium
Sodium	Potassium
Chloride	Sulphate
Total Hardness	Total Alkalinity
Ammonia Nitrogen	Total Zinc

Total Cadmium	Total Iron
Total Cobalt	Total Manganese
Total Chromium	Total Nickel
Total Copper	Total Lead
Total Aluminum	Total Arsenic
Total Mercury	Total Organic Carbon (TOC)

6. The Licensee shall sample at Monitoring Program Stations TAL-4, TAL-5 and TAL-6 annually during periods of runoff or seepage, prior to decanting and once at the beginning, middle and near the end of discharge, respectively. Samples shall be analyzed for the following parameters:

TPH (Total Petroleum Hydrocarbons)
PAH (Polycyclic Aromatic Hydrocarbons)
BTEX (Benzene, Toluene, Ethylbenzene, Xylene)

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

7. The Licensee shall report all results of acute toxicity testing as required under Part D, Item 9 within the Annual Report as per Part B, Item 1.

8. 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.

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

10. The Licensee shall annually review the QA/QC Plan and modify it as necessary. Revised QA/QC Plan shall be submitted to the Board with a current approval letter from an accredited laboratory and shall meet the standards set out in Part I, Item 8 and Part I, Item 9.

11. The Licensee shall measure and record the annual quantities of Sewage solids removed from the Sewage Disposal Facility.

12. Additional monitoring stations, sampling and analysis may be requested by an Inspector.

13. The Licensee shall include all of the data and information required by the Monitoring Program within the Licensee's Annual Report, as required under Part B, Item 1, or as requested by an Inspector.

14. Modifications to the Monitoring Program including the Monitoring Program Stations and parameters may be made only upon written approval from the Board.

Appendix E:

Water, wastewater samples Test results 2020

Water Licence: 3BM-TAL 1926

Hamlet of Taloyoak, NU

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 200469

- FINAL REPORT -

Prepared For: Hamlet of Taloyoak

Address: P.O. Box 8
Taloyoak, NU,X0E 1B0

Attn: **Janice Anderson** **Facsimile: 867-561-5057**

Final report has been reviewed and approved by:

Glen Hudy
Quality Assurance 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
  - Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF;
  - Environment Canada
  - 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: Monday, August 10, 2020
Print Date: ***Monday, August 10, 2020***

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 200469

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-1 **Taiga Sample ID:** 001

Client Project:
Sample Type: Sewage
Received Date: 24-Jul-20
Sampling Date: 23-Jul-20
Sampling Time:
Location: TALOYOAK, NU
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Ammonia as Nitrogen	1.66	0.005	mg/L	27-Jul-20	SM4500-NH3:G	
Biochemical Oxygen Demand	19	2	mg/L	24-Jul-20	SM5210:B	
CBOD	15	2	mg/L	24-Jul-20	SM5210:B	
Organic Carbon, Total	23.0	0.5	mg/L	29-Jul-20	SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	205	0.4	mg/L	24-Jul-20	SM2320:B	
Conductivity, Specific (@25C)	805	0.4	µS/cm	24-Jul-20	SM2510:B	
pH	7.73		pH units	24-Jul-20	SM4500-H:B	
Solids, Total Dissolved	450	10	mg/L	28-Jul-20	SM2540:C	
Solids, Total Suspended	26	3	mg/L	28-Jul-20	SM2540:D	
Microbiology						
Coliforms, Fecal	< 100	100	CFU/100mL	24-Jul-20	SM9222:D	
Organics						
Oil and Grease, visible	Non-visible			24-Jul-20	Visual Exam	
Subcontracted Inorganics						

ReportDate: Monday, August 10, 2020
Print Date: ***Monday, August 10, 2020***

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 200469

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-1 **Taiga Sample ID:** 001

Calcium	61.8	0.05	mg/L	05-Aug-20	EPA200.2
Chloride	84.8	0.5	mg/L	31-Jul-20	EPA300.1
Hardness	273	0.13	mg/L	05-Aug-20	EPA200.2
Magnesium	28.8	0.005	mg/L	05-Aug-20	EPA200.2
Nitrate as Nitrogen	0.496	0.020	mg/L	31-Jul-20	EPA300.1
Nitrite as N	0.140	0.010	mg/L	31-Jul-20	EPA300.1
NO2+NO3 - N	0.636	0.022	mg/L	31-Jul-20	EPA300.1
Potassium	7.38	0.05	mg/L	05-Aug-20	EPA200.2
Sodium	57.9	0.05	mg/L	05-Aug-20	EPA200.2
Sulphate	68.6	0.3	mg/L	31-Jul-20	EPA300.1
Subcontracted Organics					
Benzene	< 0.00050	0.0005	mg/L	02-Aug-20	EPA 5021
Ethylbenzene	< 0.00050	0.0005	mg/L	02-Aug-20	EPA 5021
F2: C10-C16	< 0.10	0.1	mg/L	01-Aug-20	EPA3510
F3: C16-C34	< 0.25	0.25	mg/L	01-Aug-20	EPA3510
F4: C34-C50	< 0.25	0.25	mg/L	01-Aug-20	EPA3510
Phenols, Total	< 0.0010	0.001	mg/L	04-Aug-20	AB ENV.06537
Toluene	< 0.00050	0.0005	mg/L	02-Aug-20	EPA 5021
Xylenes	< 0.00050	0.0005	mg/L	02-Aug-20	EPA 5021
Trace Metals, Total					
Aluminum	27.5	5	µg/L	29-Jul-20	EPA200.8
Arsenic	0.9	0.2	µg/L	29-Jul-20	EPA200.8
Cadmium	< 0.1	0.1	µg/L	29-Jul-20	EPA200.8
Chromium	0.2	0.1	µg/L	29-Jul-20	EPA200.8
Cobalt	0.2	0.1	µg/L	29-Jul-20	EPA200.8

ReportDate: Monday, August 10, 2020
Print Date: *Monday, August 10, 2020*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 200469

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-1 **Taiga Sample ID:** 001

Copper	2.4	0.2	µg/L	29-Jul-20	EPA200.8
Iron	230	5	µg/L	29-Jul-20	EPA200.8
Lead	< 0.1	0.1	µg/L	29-Jul-20	EPA200.8
Manganese	24.9	0.1	µg/L	29-Jul-20	EPA200.8
Mercury	0.01	0.01	µg/L	29-Jul-20	EPA200.8
Nickel	0.9	0.1	µg/L	29-Jul-20	EPA200.8
Zinc	< 5.0	5	µg/L	29-Jul-20	EPA200.8

ReportDate: Monday, August 10, 2020
Print Date: *Monday, August 10, 2020*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 200469

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-4 **Taiga Sample ID:** 002

Client Project:
Sample Type: Sewage
Received Date: 24-Jul-20
Sampling Date: 23-Jul-20
Sampling Time:
Location: TALOYOAK, NU
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Ammonia as Nitrogen	< 0.005	0.005	mg/L	27-Jul-20	SM4500-NH3:G	
Biochemical Oxygen Demand	4	2	mg/L	24-Jul-20	SM5210:B	
CBOD	4	2	mg/L	24-Jul-20	SM5210:B	
Organic Carbon, Total	15.3	0.5	mg/L	29-Jul-20	SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	54.1	0.4	mg/L	24-Jul-20	SM2320:B	
Conductivity, Specific (@25C)	170	0.4	µS/cm	24-Jul-20	SM2510:B	
pH	9.25		pH units	24-Jul-20	SM4500-H:B	
Solids, Total Dissolved	102	10	mg/L	28-Jul-20	SM2540:C	
Solids, Total Suspended	10	3	mg/L	28-Jul-20	SM2540:D	
Microbiology						
Coliforms, Fecal	< 1	1	CFU/100mL	24-Jul-20	SM9222:D	
Organics						
Oil and Grease, visible	Non-visible			24-Jul-20	Visual Exam	
Subcontracted Inorganics						
Calcium	15.6	0.05	mg/L	04-Aug-20	EPA200.2	

ReportDate: Monday, August 10, 2020
Print Date: ***Monday, August 10, 2020***

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 200469

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-4 **Taiga Sample ID:** 002

Chloride	16.9	0.5	mg/L	31-Jul-20	EPA300.1
Hardness	62.8	0.13	mg/L	04-Aug-20	EPA200.2
Magnesium	5.81	0.005	mg/L	04-Aug-20	EPA200.2
Nitrate as Nitrogen	< 0.0200	0.020	mg/L	31-Jul-20	EPA300.1
Nitrite as N	< 0.0100	0.010	mg/L	31-Jul-20	EPA300.1
NO2+NO3 - N	< 0.0220	0.022	mg/L	31-Jul-20	EPA300.1
Potassium	1.42	0.05	mg/L	04-Aug-20	EPA200.2
Sodium	9.55	0.05	mg/L	04-Aug-20	EPA200.2
Sulphate	3.32	0.3	mg/L	31-Jul-20	EPA300.1
Subcontracted Organics					
Benzene	< 0.00050	0.0005	mg/L	02-Aug-20	EPA 5021
Ethylbenzene	< 0.00050	0.0005	mg/L	02-Aug-20	EPA 5021
F2: C10-C16	0.17	0.10	mg/L	01-Aug-20	EPA3510
F3: C16-C34	< 0.25	0.25	mg/L	01-Aug-20	EPA3510
F4: C34-C50	< 0.25	0.25	mg/L	01-Aug-20	EPA3510
Phenols, Total	< 0.0010	0.001	mg/L	02-Aug-20	AB ENV.06537
Toluene	< 0.00050	0.0005	mg/L	02-Aug-20	EPA 5021
Xylenes	< 0.00050	0.0005	mg/L	02-Aug-20	EPA 5021
Trace Metals, Total					
Aluminum	20.2	5	µg/L	29-Jul-20	EPA200.8
Arsenic	2.2	0.2	µg/L	29-Jul-20	EPA200.8
Cadmium	< 0.1	0.1	µg/L	29-Jul-20	EPA200.8
Chromium	< 0.1	0.1	µg/L	29-Jul-20	EPA200.8
Cobalt	0.1	0.1	µg/L	29-Jul-20	EPA200.8
Copper	1.0	0.2	µg/L	29-Jul-20	EPA200.8

ReportDate: Monday, August 10, 2020
Print Date: *Monday, August 10, 2020*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 200469

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-4 **Taiga Sample ID:** 002

Iron	351	5	µg/L	29-Jul-20	EPA200.8
Lead	0.2	0.1	µg/L	29-Jul-20	EPA200.8
Manganese	10.1	0.1	µg/L	29-Jul-20	EPA200.8
Mercury	< 0.01	0.01	µg/L	29-Jul-20	EPA200.8
Nickel	0.4	0.1	µg/L	29-Jul-20	EPA200.8
Zinc	13.4	5	µg/L	29-Jul-20	EPA200.8

ReportDate: Monday, August 10, 2020
Print Date: *Monday, August 10, 2020*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 200469

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-3 **Taiga Sample ID:** 003

Client Project:
Sample Type: Sewage
Received Date: 24-Jul-20
Sampling Date: 23-Jul-20
Sampling Time:
Location: TALOYOAK, NU
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Ammonia as Nitrogen	6.67	0.005	mg/L	27-Jul-20	SM4500-NH3:G	
Biochemical Oxygen Demand	33	2	mg/L	24-Jul-20	SM5210:B	
CBOD	29	2	mg/L	24-Jul-20	SM5210:B	
Organic Carbon, Total	39.7	0.5	mg/L	29-Jul-20	SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	192	0.4	mg/L	24-Jul-20	SM2320:B	
Conductivity, Specific (@25C)	773	0.4	µS/cm	24-Jul-20	SM2510:B	
pH	8.03		pH units	24-Jul-20	SM4500-H:B	
Solids, Total Dissolved	444	10	mg/L	28-Jul-20	SM2540:C	
Solids, Total Suspended	40	3	mg/L	28-Jul-20	SM2540:D	
Microbiology						
Coliforms, Fecal	200	100	CFU/100mL	24-Jul-20	SM9222:D	
Organics						
Oil and Grease, visible	Non-visible			24-Jul-20	Visual Exam	
Subcontracted Inorganics						
Calcium	49.2	0.05	mg/L	05-Aug-20	EPA200.2	

ReportDate: Monday, August 10, 2020
Print Date: ***Monday, August 10, 2020***

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 200469

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-3 **Taiga Sample ID:** 003

Chloride	99.1	0.5	mg/L	31-Jul-20	EPA300.1
Hardness	217	0.13	mg/L	05-Aug-20	EPA200.2
Magnesium	22.9	0.005	mg/L	05-Aug-20	EPA200.2
Nitrate as Nitrogen	0.297	0.020	mg/L	31-Jul-20	EPA300.1
Nitrite as N	0.506	0.010	mg/L	31-Jul-20	EPA300.1
NO2+NO3 - N	0.802	0.022	mg/L	31-Jul-20	EPA300.1
Potassium	12.6	0.05	mg/L	05-Aug-20	EPA200.2
Sodium	65.7	0.05	mg/L	05-Aug-20	EPA200.2
Sulphate	34.0	0.3	mg/L	31-Jul-20	EPA300.1
Subcontracted Organics					
Benzene	< 0.00050	0.0005	mg/L	02-Aug-20	EPA 5021
Ethylbenzene	< 0.00050	0.0005	mg/L	02-Aug-20	EPA 5021
F2: C10-C16	< 0.10	0.10	mg/L	01-Aug-20	EPA3510
F3: C16-C34	< 0.25	0.25	mg/L	01-Aug-20	EPA3510
F4: C34-C50	< 0.25	0.25	mg/L	01-Aug-20	EPA3510
Phenols, Total	< 0.0010	0.001	mg/L	02-Aug-20	AB ENV.06537
Toluene	< 0.00050	0.0005	mg/L	02-Aug-20	EPA 5021
Xylenes	< 0.00050	0.0005	mg/L	02-Aug-20	EPA 5021
Trace Metals, Total					
Aluminum	31.7	5	µg/L	29-Jul-20	EPA200.8
Arsenic	1.2	0.2	µg/L	29-Jul-20	EPA200.8
Cadmium	< 0.1	0.1	µg/L	29-Jul-20	EPA200.8
Chromium	0.2	0.1	µg/L	29-Jul-20	EPA200.8
Cobalt	0.3	0.1	µg/L	29-Jul-20	EPA200.8
Copper	6.7	0.2	µg/L	29-Jul-20	EPA200.8

ReportDate: Monday, August 10, 2020
Print Date: *Monday, August 10, 2020*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 200469

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-3 **Taiga Sample ID:** 003

Iron	119	5	µg/L	29-Jul-20	EPA200.8
Lead	0.1	0.1	µg/L	29-Jul-20	EPA200.8
Manganese	33.1	0.1	µg/L	29-Jul-20	EPA200.8
Mercury	0.01	0.01	µg/L	29-Jul-20	EPA200.8
Nickel	1.3	0.1	µg/L	29-Jul-20	EPA200.8
Zinc	6.4	5	µg/L	29-Jul-20	EPA200.8

ReportDate: Monday, August 10, 2020
Print Date: *Monday, August 10, 2020*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 200469

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-3 **Taiga Sample ID:** 003

*** 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: Monday, August 10, 2020

Print Date: *Monday, August 10, 2020*