Annual Report -2018

Water Licence: 3BM-PEL 1419

Hamlet of Kugaaruk, NU

Date: Feb 14, 2019

Submitted to:
Nunavut Water Board (NWB)

ᑲᑐᑎᒍᒍ ᓄᓇᕗᑦ ᐱᕈᖅᓴᕐᓂᐊᑎᓪᓗᒍ
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Department of Community and Government Services
Nunalingni Kavamatkunnilu Pivikhaqautikkut
Ministère des Services Communautaires et gouvernementaux

February 14, 2019

Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1L0
Attention: Richard Dwyer, Manager of Licensing, Manager of Licensing

RE: 3BM-PEL1419 - Annual Report 2018, Hamlet of Kugaaruk

Dear Richard,

The Hamlet of Kugaaruk is pleased to submit to Nunavut Water Board the Annual Report 2018 of water uses and sewage solid waste disposal as directed under compliances of Water Licence 3BM-PEL1419. Copies of samples test reports are appended herewith.

The Licensee has made some effective measures for solid waste and metal waste management during the summer and fall which include facilities access improvement, drainage grading, loose waste reduction, bulk metal segregating and breaking into smaller pieces, hazardous waste and waste batteries storage in secure containments. Facilities monitor and waste water & effluent sampling program carried during July-September in compliance to the Licence. Decanting to sewage lagoon water carried during July-Sep with control discharge into wetland. Samples test result shown a control on contaminants parameters within allowable limits with some exception to leak effluent. We summarized those conditions and requirements outlined **in Parts B - H**.

We hope that Nunavut Water Board will find this report and supporting test results valuable to Annual Report in operating the Water Licence for water, sewage and solid waste facilities in Kugaaruk, Nunavut.

CGS is submitting this Annual Report 2018 on behalf of the Hamlet of Kugaaruk.

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: John Ivey, Senor Administrative Officer, Hamlet of Kugaaruk, NU
Baba Pedersen, Resource Management Officer, AANDC

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

HAMLET OF KUGAARUK
P.O. Box 205, Kugaaruk
Nunavut X0B 1K0
Phone: (867) 769 6281 ext 30 Fax: (867) 769 6069
E Mail: sao_kug@qiniq.com

February 10 2019

Mr. Shah Alam
Municipal Planning Engineer
Community Government Services
Kitikmeot Region,
Government of Nunavut
Cambridge Bay, Nunavut

Mr. Alam.

The Hamlet of Kugaaruk once again is seeking your qualified and technical assistance to complete, assemble and submit the necessary reports and forms to the Nunavut Water Board to make application for renewal of our Water License.

Thank You!

John R Ivey
Senior Administration Officer
Hamlet of Kugaaruk
867 769 6281 Ext 1002

Annual Report-2018

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ATTACHMENT

EXECUTIVE SUMMARY:

Annual Report 2018 to the Nunavut Water Board (NWB) has been prepared to meet requirements of the Licence 3BM-PEL1419 for the Hamlet of Kugaaruk through Conditions to Monitoring program. This report covers the period January 01 to December 31, 2018.

Raw water intake through twin intake pumps from the river location marked at PEL- 1, treated by Cartage filters using 20 micron (M) through 1 micron (M), followed by UV system, and chlorination before supply to community household tanks by hamlet operated water trucks. Quantity of water uses during this period is about **33,949, 128** m3, within the allowable limit of 45,000 m3.

Raw sewage water collected from household sewage tanks using hamlet operated vacuum trucks, hauled to sewage lagoon where it discharged through discharge flute. Raw sewage stayed inside the lagoon for almost 9 months (Oct – Jun) and it stayed frozen inside and received primary treatment naturally. Decanting of lagoon water carried twice during July –Sep to reduce quantity and to make room for oncoming raw sewage .Samples were collected before, during and after decanting, tested at Taiga Laboratory for parameter values to verify compliance to Environmental regulation.

Household wastes were collected by hamlet operated covered truck and hauled to community waste dump site. Wastes from private user and commercial users were hauled by their trucks to the waste facility under hamlet administration. Major cleanup to solid waste facility were done during July-Sep and items clean included waste fuel drums, wood products, plastic products, metal products, aluminum, tin, animal carcass, and household waste components . Dumps from school burn items were piled on a location inside the metal dump facility which needed heavy equipment to break down and burry inside trench if to manage locally, otherwise to ship out to the receiving organization. Two liner cells filled with contaminated and spills materials inside the facility. There is no separate facility for spills or hazardous materials, but these liner cells uses temporary storage. Waste oil, waste paint drums and waste batteries replaced into C-cans and waiting for shipping out.

Sewage lagoon berm leaking continued at the south-southeast and a new spot at the north side. Leak effluent samples were collected together with raw sewage water and decanted water, tested at taiga lab for environmental compliance. Consultant has submitted the Final report for remediation options and design, among which full liner lagoon with possible increase in berm height to maintain the capacity is considered the best option. CGS is working for contractor hiring and construction of major works expected to be started in summer 2019.

General Conditions:

- Water quantity intake from all sources and supplied to community residents, commercial, institutional and other uses are shown from monthly records, and sewage volume estimated as maximum percentage of possible water volume, measured on daily basis.
- No modification to sewage waste disposal, wetland or solid waste site during this period.
- No other unauthorized discharge to water or waste but continuous leak at sewage lagoon.
- No changes to O&M manuals for water system, sewage & solid waste facilities Monitoring
- No changes to Spill Contingency Plans for sewage and solid waste management as approved.
- Plan of Compliances were followed as approved for summer, spring, fall and winter.
- Annual quantity of **33,349,128** cubic metres water drawn from the river is within the allowable annual limit **45,000** cubic metres. Water supply to household tanks by Hamlet operated trucks 7days a week.
- Erosion protection at the river bank berm and eroded spots at truckfill area were carried, and signs were installed at the water intake point by the water, at the intake pump control point inside the treatment plant building and at the point of raw water sampling point from pipe inside the treatment plant for winter, directed by the Inspector.

Waste Disposal

- Sewage waste both grey and black combined from urinal, toilet flush and shower and kitchen water are stored in the household tank and collected by vacuum truck which is hauled to community sewage lagoon and discharged.
- Amount of sewage generated during this period is less than 32,300 m3 which is calculated considering 90-95 % of water supply by truck.
- All sewage and waste effluent samples were tested for parameters before decanting outside.
- Freeboard at sewage lagoon maintained more than1.0 m and decanted twice using a pump.
- The existing wetland and control pond facilities used for final polishing and remediation of sewage water. Test results shown the effluent at end of pipe (PEL- 4) within limiting values.

Non-hazardous domestic Solid Waste:

- Residents store household waste at the prescribed bins by the hamlet, and hamlet operated trucks hauled them to the dump site 3-4 days a week. Hazardous waste are separated from regular waste and secured inside the C-can for shipping out.
- All other loose waste buried inside trenches along with small debris pieces by pushing down and covered by gravels.
- Waste batteries were secured inside the C-can in wooden boxes wrap with plastic sheets.
- Paper board, cloth, light wood product and loose materials were reduced by slow burning time to time and animal carcass buried under sand-pit inside the facility.
- Annual monitoring of water source, sewage and solid waste effluent were carried by the hamlet operators during summer - fall. Samples were collected from monitoring stations as part of QA/QC plan implementation and tested for parameters at Taiga Laboratory.

ᐃᒪᖅᒧ ᓚᐃᓴ 3BM-PEL 1419 ᐅᑭᐅᖅ 2018ᒥ ᑐᓴᒐᒃᓴᖅ

ᐊᐅᓚᑎᔨᐅᑉ ᑐᑭᓕᐅᖅᑕᖏᑦ:

2018ᒥᒃ ᐅᑭᐅᖅᒥ ᓇᑦᑎᐅᒪᓂᖅᒧ ᑐᓴᒐᒃᓴᖅ ᓄᓇᕘᒥ ᐃᒪᖅᒧ ᑲᑎᒪᔩᖏᓐᓄ ᐃᑦᑐᐊᖅᓴᖅᑕᐅᑖᖅᓯᒪᖓᒪᑕ ᐊᒪᓗ ᐱᔭᕆᐊᖃᖅᓯᒪᖓᒪᑕ ᓚᐃᓴᖓ ᒪᓂᒃᓗᒍ 3BM-PEL 1419 Hᐋᒻᓚᑦᑯᓐᓄ ᑰᒑᖅᖠᒥᐅᑕᓄ ᑕᐃᑰᓇ ᐱᔭᒃᓴᐅᖓᒪᑕ ᖃᓄᐃᓕᖅᓂᖏᓐᓄ ᐊᒪᓗ ᖃᐅᔨᓴᐃᓂᖅᒥ. ᑖᒻᓇ ᑐᓴᒐᒃᓴᐅᔪᖅ ᔭᓄᐊᕆ 01ᒥᒃ ᑎᓯᒻᐳ 31, 2018ᒧ ᑭᒃᑎᖃᖅᓗᒍ.

ᐃᒪᖅ ᐃᓚᓯᒪᖏᑎᑦᓗᒍ ᑕᐃᑰᓇ ᒪᕈᓕᒃᓂ ᐃᑯᒪᓅᖅᑐᒧ ᐃᒥᖅᑐᐃᕙᑎᖓᒎᖅᓗᒍ ᐃᒪᖅᓗ ᑕᒪᓐᓇ ᑰᒃᒥᖖᒑᖅᑐᖅ ᓇᓗᓇᐃᔭᖅᓯᒪᕙᖅ PEL-1, ᐊᒪᓗ ᓴᓗᒪᐃᖅᑕᐃᓕᕙᑎᒥ ᐊᑐᖅᓯᒪᓗᑎ ᓴᖏᓂᖃᖅᑐᓂ ᓈᓴᐅᑎᖓᒍ 20ᒥᒃ, ᐊᒪᓗ ᑕᐃᑰᓈᕋᑕᖅᓯᒪᓗᓂᓗ ᑐᖁᓇᖃᑐᒃᑯᑦ, ᑕᐃᒪᓕ ᑐᖁᓇᖃᖅᑐᒥ ᐃᓚᖃᓕᖄᖅᑎᑦᓗᒍ ᐃᒃᓗᖅᕙᐊᓄ ᐃᒥᖅᑐᒐᒃᓴᖑᖅᓯᒪᕋᑕᖅᓗᓂ. ᑕᐃᒪᓗ ᑯᕕᕋᖅᑕᐅᓯᒪᕙᑐᖃᐃ ᑯᕕᕋᐃᕕᒃᒦᓯᒪᓕᐅᖅᑐ ᑕᕿᓄ ᖃᓕᐅᖏᓐᓄᐊᖅᑐᓄ (ᐋᒃᑐᐸᒥ -ᕚᓐ)ᒧ ᐊᒪᓗ ᓯᖅᒥᐅᓕᖅᓗᓂᓗ ᐊᒪᓗ ᓯᖅᒥᐅᒐᓗᐊᖅᑎᑦᓗᒍ ᐃᓕᕆᐊᖅᑕᐅᕋᑕᓚᐅᖅᑐᖅ ᓇᓗᓇᐃᔭᐅᑎᐅᕙᓖᕈᑕᐅᕙᒧ. ᑕᐃᒪᓗ ᐃᒪᒧᐃᔭᖅᑕᐅᕋᑕᓚᐅᖅᑐᖅ ᕙᓚᐃᒥ ᓯᑕᒻᐳ ᑕᕿᖓᓄ ᐃᓂᒃᓴᕐᑯᕐᑯᔭᐅᓗᑎᒃ ᐅᑉᓗ ᑕᒫ ᑯᕕᕋᖅᑕᐅᕋᖅᑐᓄ. ᑕᐃᒪᓗ ᐃᒪᐃᔭᖅᑕᐅᓂᐊᓵᖅᑎᓗᒍ ᖃᐅᔨᓴᖅᑕᐅᕋᑕᖅᓯᒪᕙᖅ ᑯᕕᔭᐅᕙᕕᓃᑦ ᑕᐃᑲᓂ ᖃᐅᔨᓴᖅᑕᐅᕕᒃᒥ ᒪᓕᒐᖅᒥ ᒪᓕᒃᓗᑎ ᐊᕙᑎᓕᕆᓂᖅᒧ ᒪᓕᒐᖕᒐᓂᑦᑕᐅᖅ ᒪᓕᒃᓗᑎᒃ ᖃᐅᔨᓴᐃᕋᑕᖅᓯᒪᕙᐃᑦ.

ᐃᒃᓗᖅᕙᐊᓂ ᑯᕕᕋᖅᑕᐅᕋᑕᖅᑐᐃᑦᓗ ᑲᑎᖅᓱᕐᑕᐅᓚᐅᖅᑐ Hᐋᒻᓚᑦᑯᓐᓂ ᐃᒪᐃᔭᐅᑎᒧ ᐊᒪᓗ ᑯᕕᕋᖅᑕᐅᕋᑕᖅᓗᑎᓗ ᑰᕕᕋᐃᕕᒃᒧ ᓄᓇᓕᐅᑉ ᐃᓗᐊᓂ. ᑕᒪᒃᑯᐊᑦᓗ ᐃᓄᖕᓂ ᐃᒃᓗᐃ ᓇᒥᓂᕆᔭᐅᕙᐃ ᐊᒪᓗ ᐃᒃᓗᖅᕙᐊᑦ ᑎᑎᕋᖅᕕᓖᓗ ᐃᒪᐃᔭᖅᑕᐅᕋᑕᓚᐅᖅᑐᐃᑦᑕᐅᖅ ᑯᕕᕋᐃᑎᒧ Hᐋᒻᓚᑦᑯᓐᓂᑦᓚ ᑕᒪᓐᓇ ᑯᕕᕋᐃᓂᖅ ᑲᒪᕋᑕᖅᒪᑦᕙ. ᐊᖏᓂᖅᐹᖑᔭᓂᑦᓗ ᓴᓗᒪᐃᑐᓂ ᓴᓗᒪᖅᓴᐃᓚᐅᖅᑐ ᑕᕿᐅᑎᑦᓗᕆ ᕙᓚᐃᒥ ᓯᑕᒻᐳ ᑕᕿᖓᓄ ᐊᒪᓗ ᑕᒪᒃᑯᐊᑕᐅᖅ ᖃᑦᑕᐅᔭᐃᑦ ᐃᒪᖃᖏᑐᐃ ᑲᑎᑕᐅᓚᐅᖅᓗᑎ, ᕿᕙᒃᓂᑦᓗ, ᓴᕕᐅᖏᑎᓂᑦᓗ, ᓴᕕᐅᕙᓂᑦᓗ, ᓴᕕᕋᔭᒃᓂᑦᓗ, ᐃᐳᐃᑎᕕᓃᑦᓗ, ᓂᕿᕕᓃᑦᓗ, ᐊᒪᓗ ᐃᒃᓗᖅᕙᐊᓂ ᐅᑉᓗ ᑕᒫᖅᑎᓯᐅᑎᓂ ᐃᓱᐅᖄᖅᑕᐅᕋᑕᖅᑐᓂ ᓴᓗᒪᖅᓴᐃᓚᐅᖅᑐᒧ. ᑕᐃᒪᓗ ᐃᓕᓐᓂᐊᖅᕕᒃ ᐃᑯᐊᓚᓚᐅᖅᑐᖅ ᓴᓗᒪᐃᓂᖕᑦ ᑲᑎᖅᓱᖅᓗᑎᒡᒍ ᐊᑕᐅᑎᒧ ᐱᓕᕆᐊᕆᓚᐅᖅᑕᒍᑦ ᐊᒪᓗ ᑕᐃᑯᖓ ᐃᒥᐅᖃᓚᐅᖅᓗᑎᒡᒎᑦ ᓴᕕᒃᑕᖃᐅᕋᑕᖅᑐᓄ ᐊᑦᑕᖅᕕᖓᓄ ᐊᒪᓗ ᐃᓚᖏᑦ ᓴᐅᓗᑎᒎᑦᓗ ᓴᐅᔭᐅᔭᕆᐊᓖᑦ, ᐊᐅᓪᓚᖅᑎᑕᐅᔭᕆᐊᓖᓗ ᐊᑕᐅᑎᒧᖓᖅᓗᑎᒎ. ᒪᕈᓕᖅᓯᒪᕙᖅᑕᐅ ᐆᒃᓴᐅᕙᐃᑦ ᓴᓗᒪᐃᑐᓄ ᑕᒪᒃᓂᖓ ᐃᒪᐅᕙᐃ ᓴᓗᒪᐃᑐᐃ ᐊᒪᓗ ᑯᕕᕙᕕᓃᑦᓗ ᓴᓗᒪᐃᑐᐃ ᐆᖅᓯᒪᕙᐃᑦ. ᑭᓯᐊᓂᓕ ᐃᓖᒃᑯᑦ ᑐᖁᕙᖃᖏᒪᑕ ᓴᓗᒪᐃᑑᕙᐅ ᐃᒪᐅᓂᖅᓴᓂ, ᑭᓯᐊᓂᒃᑕᐅᖅ ᐆᖅᑐᖅᑎᐊᖅᓯᒪᕙᐃ ᐊᒪᓗ ᐊᐅᓪᓚᖅᑎᑕᐅᕙᓐᓇᓕᖅᐸᑕ ᐊᐅᓪᓚᖅᑎᑕᐅᕙᒫᖅᑐ. ᑕᒪᒃᑯᐊᑦᓗ ᐋᑐᓖᕕᓃᑦᓗ ᐃᒪᖏ, ᐅᖅᓱᕐᑎᕈᑎᕕᓃᑦᓗ, ᒥᖑᑎᕕᓃᑦᓗ ᐆᖅᑐᖅᑕᐅᓯᒪᔭᐃᑦ ᐅᒥᐊᖅᕙᐊᒃᑯ ᐆᓇᕋᖅᑕᖏᓐᓂᒃ ᓂᐅᕕᐊᒃᓴᓄ ᐊᒪᓗ ᐆᖅᑐᖅᓯᒪᑎᓪᓗᒋᑦ ᐊᐅᓪᓚᖅᑎᑕᐅᕙᒫᖅᑐ.

ᑯᕕᕋᐃᕕᐅᕋᑕᖅᑐ ᐊᕙᓪᓗᖓ ᓴᓇᓯᒪᕙᖅ ᓱᓕ ᑯᕕᕋᑕᖅᒪ ᑯᕕᕋᐃᕕᐅᕋᑕᖅᑐ ᓯᓚᑖᒍ ᐊᒪᓗ ᓇᓗᓇᐃᖅᓯᓚᐅᖅᓗᑎ ᑯᕕᕋᕋᑕᓕᓵᖅᑐᑎᒍ ᑕᐃᑲᖕᒐ ᐅᐊᓐᓇᐅᑉ ᒥᒃᓵᒍ, ᑕᐃᒪᓗ ᑯᕕᖅᑕᐅᔭᐃᑦ ᐊᒪᓗ ᐊᕙᓪᓘᑉ ᑯᕕᓂᐊᒍᑦ ᖃᐅᔨᓴᖅᑕᐅᕋᑕᖅᑐ, ᑕᐃᒪᓗ ᖃᐅᓴᖅᑕᐅᕋᑕᖅᑐ ᐊᕙᑎᓕᕆᔨᒃᑯᓐᓂ. ᑕᐃᒪ ᑯᕕᕋᕋᑕᓕᖅᑎᑦᓗᒍ ᐊᓯᐊᒍ ᐃᓱᒪᕆᔭᐅᓕᖅᑐᖅ ᑕᒪᓐᓇ ᐊᕙᓪᓗᐊ ᐳᖅᑐᓯᕆᐊᖅᑕᐅᕙᓕᖅ ᑯᕕᕋᖏᓂᖅᓴᐅᓂᐊᖅᒪ ᐊᓯᐊᒍ. ᑖᒃᑯᐊᓪᓗ ᓄᓇᓕᒃᓄ ᐊᒪᓗ ᑲᕙᒪᓕᓇᐃᒃᑯᑦ ᐅᑭᐅᖅᒥ 2019ᒥᒃ ᐊᐅᔭᐅᑎᓪᓗᒍ ᓴᓇᕿᔭᒪᔭᐃᑦ ᑯᕕᕋᐃᕕᒥ.

ᐃᒪᖅᒧ ᓚᐃᓴ 3BM-PEL 1419 ᐅᑭᐅᖅ 2018ᒥ ᑐᓴᒐᒃᓴᖅ

ᖃᓄᐃᓕᖅᓂᖏᑦ:

- ᐃᒥᖅᑕᖅᑕᐅᓃᑦ ᐃᒪᖅᑐᓂᖕᒐ ᑕᐃᑲᖕᒐ ᐃᒥᖅᑕᐅᑎᒥ ᓄᓇᓕᒃᒥᐅᑕᓄ ᐃᒥᖅᑕᕐᑕᐅᕋᑕᖅᑐ, ᑎᑎᕋᖅᕕᖃᐅᖅᓂᓪᓗ ᒧᓇᖅᓯᖃᖅᕕᒃᓗ ᐊᒪᓗ ᐊᓰᑦ ᐃᒥᖅᑕᕐᑕᐅᕋᑕᖅᑐ ᓇᓗᓇᐃᔭᖅᑕᐅᕋᑕᖅᑐ ᑕᕿ ᓇᓪᓕᕌᖕᒐ ᐊᒪᓗ ᑯᕕᕋᖅᑕᐅᕋᑕᖅᑐ ᓇᓗᓇᐃᔭᖅᑕᐅᕋᑕᖅᑐ ᐅᑉᓗ ᑕᒫ.
- ᓄᑖᖅᒥ ᐱᔭᒃᓴᖃᖕᒋᑦᑐᖅ ᓱᓕ ᑯᕕᕋᐃᕕᐅᕋᑕᖅᑐᒧ, ᑯᕕᕋᐃᕕᐅᕋᑕᖅᑐ ᐊᒪᓗ ᐊᑦᑕᖅᕖᑦᓗ ᖃᐅᔨᓴᖅᑕᐅᓯᒪᖕᒋᑦᑐᖅ
- ᐊᓯᐊᒍ ᐃᓗᐃᓕᐅᕈᑎᖃᖕᒋᑦᑐᖅ ᐃᒥᖅᑕᖅᕕᒃ ᐊᒪᓗ ᑯᕕᕋᐃᕕᐅᕋᑕᖅᑐ ᑭᓯᐊᓂᓕ ᓱᓕ ᑯᕕᕋᐃᕕᐅᕋᑕᖅᑐ ᑯᕕᕋᖅᑕᖅᒪ
- ᐊᓯᐊᖑᖅᑎᕆᓯᒪᖕᒋᑦᑐᖅ ᐃᖕᒋᕋᔪᑕᐅᔪᓄ ᐊᒪᓗ ᓴᓇᕿᓂᒃᑯ ᐃᒪᖅᒧ ᐊᒪᓗ ᑯᕕᕋᐃᕕᐅᕋᑕᖅᑐᒧ
- ᓱᓕ ᐊᓯᐊᖑᖅᑎᕆᓯᒪᖕᒋᑦᑐᖅ ᐸᖅᓇᐅᑕᐅᔪᓂ ᑯᕕᕋᐃᕕᒃᒧ ᐊᒪᓗ ᐊᐅᓚᑕᐅᓂᖕᒐᓄ.
- ᐸᖅᓇᐃᓂᖅᓗ ᐊᖕᒋᖅᑕᐅᓯᒪᔪᐃᑦ ᐊᐅᔭᐅᑎᓪᓗᒍ ᐱᔭᒃᓴᐅᓂᐊᖅᑐᓄ, ᐅᑭᐊᒃᓵᒃᑯᑦ ᐊᒪᓗ ᐅᑭᐅᑯᑦ.
- ᐅᑭᐅᓕᒫᖅᒧ ᐃᒥᖅᑕᕐᑕᐅᕋᑕᕆᐊᓕᒃ ᐃᒪᖅᑐᐃᓂᐊ 33,349,128ᓖᑕᓂᒃ ᐊᒪᓗ ᐅᑭᐅᓕᒫᖅᒧ ᑭᒃᓕᖃᖅᓗᓂ ᐃᒥᖅᑕᖅᑕᐅᕋᑕᕆᐊᖃᖅᓂ ᑭᒃᓕᖃᕋᓗᐊᖅᓗᓂ 45,000ᓖᑕᓂᒃ ᐊᒪᓗ ᐃᒥᖅᑕᐅᑏᓐᓇᖅᒧ ᐃᒥᖅᑕᖅᕋᑕᖅᓗᑎᒃ ᐅᑉᓗ ᑕᒫ ᐊᒪᓗ ᐅᑉᓗᓄ ᒪᕈᖕᓂ ᐊᖅᕕᓂᓖᒃᓄ.
- ᓴᐳᓐᓂᐊᕆᐊᓖᑦ ᑰᒐᖅᒥ ᐃᒥᖅᑕᖅᕕᐅᕋᑕᖅᑐᒥ ᐊᕙᓪᓗᖕᒐ ᖃᐅᔨᓴᖅᑕᐅᑎᐊᕋᑕᖅᓯᒪᔪᖅ , ᐊᒪᓗ ᓇᓗᓇᐃᑯᑕᖅᓂ ᑎᑎᖅᑲᓂᒃ ᐃᓕᐅᖅᑲᐃᓯᒪᓗᑎᓗ ᐃᒥᖅᑕᖅᕕᒃᒥ ᑕᐃᑰᓇ ᐃᒥᖅᑕᖅᕕᐅᕋᑕᖅᑐᒃᑯ, ᐊᒪᓗ ᑕᐃᑲᓂ ᐃᒥᖅᑕᖅᕕᒃᒥ ᐃᒃᓗᖅᔪᐊᖕᒐᓂ ᐃᒪᖅᒧ ᐃᓚᒃᓴᐃᓪᓗ ᑐᖁᓇᐅᔪᐃᑦ ᐃᒪᖅᒦᓕᖄᖅᑎᓗᒋ ᖃᐅᔨᓴᖅᑕᐅᕋᑕᖅᓯᒪᔪᐃᑦ ᑕᐃᑰᓇ ᓱᑉᓗᐊᒍ ᐅᑭᐅᒃᑯᑦ ᖃᐅᔨᓴᖅᑕᐅᕋᑕᖅᓯᒪᔪᖅ.

ᑯᕕᕋᖅᑕᐅᔪᑦ

- ᑯᕕᕋᖅᑕᐅᔪᑦ ᑕᑕᒪᐃᖕᓂ ᐊᖅᔮᓗᒃᑐᒥ ᐊᒪᓗ ᕿᖅᓂᖅᑐᒥ ᑲᓗᖃᑐ ᐊᑕᐅᑎᖅᑯ ᐃᒪᐃᔭᖅᑕᐅᕋᑕᖅᒪᑕ ᐊᒪᓗ ᖁᐃᔭᐅᔪᐃᓪᓗ, ᑯᕕᔭᐅᔪᐃᓪᓗ ᐊᓇᖅᕕᒃᒥ, ᐃᖅᒥᒍᑕᐅᕋᑕᖅᑐᖅᓗ ᐅᕕᓂᖅᓂᐊᕐᓂᖅᒧᓪᓗ ᐊᒪᓗ ᐃᒐᒃᕕᒃᒥᓪᓗ ᑯᕕᕋᖅᑕᐅᔪᐃᑦ ᐊᑕᐅᑎᒥ ᐴᖅᑕᐅᓯᒪᕋᑕᖅᑐ ᐊᒪᓗ ᑯᕕᕋᖅᑕᐅᕋᑕᖅᑐ ᐃᒪᐃᔭᐅᑎᒧ ᐊᒪᓗ ᑕᐃᑲᖕᒐ ᐃᒪᐃᔭᐅᑎᒥ ᑯᕕᔭᐅᕋᑕᖅᓗᓂᓗ ᑯᕕᕋᐃᕕᒃᒧ.
- ᑕᐃᒪᓕ ᐃᒪᖅᑐᓂᐊ ᑯᕕᕋᖅᑕᐅᔪᐃ ᑯᕕᕋᖅᑕᐅᕙᓪᓕᐊᕋᑕᖅᑎᓗᒍ ᐊᖕᒋᓂᖅᑲᖅᑐ 32,300 ᐆᑦᑐᕋᐅᑎᖕᒐ ᐱᖕᒐᓱᐃᖅᑕᖅᓗᒍ ᑕᐃᒪᓕ ᓈᓴᖅᑕᐅᓯᒪᔪᖅ ᓇᓗᓇᐃᔭᖅᑕᐅᓯᒪᔪᐃᑦ ᐊᒪᓗ ᐃᓱᒪᒋᔭᐅᓯᒪᑐᐃᓐᓇᖅᑐᖅ ᑕᐃᒪᐃᑐᒥᒃ.
- ᑕᒪᐃᑕᓗ ᑯᕕᕋᖅᑕᐅᔪᐃ ᐊᒪᓗ ᐅᑉᓗ ᑕᒫ ᑯᕕᕋᖅᑕᐅᔪᐃ ᖃᐅᔨᓴᖅᑕᐅᕋᑕᖅᑐ ᖃᐅᑕᒫ ᑯᕕᕋᐃᕕᐅᕋᑕᖅᑐᒧ.
- ᐃᒪᐃᔭᐃᓂᖅ ᑕᐃᑲᓂ ᑯᕕᕋᐃᕕᒃᒥ ᐃᒪᖅᑐᓂᖕᒐ ᐳᖅᑐᓂᖃᓚᐅᖅᑐᖅ 1.0ᒦᑕᓂᒃ ᐊᒪᓗ ᑯᕕᕋᐃᑎᒧ ᐃᒪᐃᔭᖅᑕᐅᓚᐅᖅᑐᖅ ᒪᕈᐃᖅᑕᖅᓗᐊᖅᓗᒋᑦ ᓄᓇᒃᑰᕈᑎ
- ᒫᓐᓇᐅᔪᖅ ᑯᕕᕋᐃᕕᐅᕋᑕᖅᑐ ᐊᒪᓗ ᐊᐅᓚᑎᔪᑕᐅᔪᐃᓪᓗ ᑯᕕᕋᐃᕖᑦ ᑭᖑᓖᑐᒧ ᐊᒪᓗ ᐃᓪᓗᐊᖅᓴᕆᐊᖅᑕᐅᓂᖅᒧ ᑯᕕᕋᖅᑕᐅᔪᒧ ᖃᐅᔨᓴᖅᑕᐅᕋᑕᖅᑐ ᒪᓕᒃᓗᒍ ᓚᐃᓴᐅᑉ ᓈᓴᐅᑎᖕᒐ PEL-4 ᑭᒃᓕᖅᑎᑕᐅᓯᒪᕋᑕᖅᑐ ᐱᕝᕕᕆᕋᑕᕆᐊᖅᑲᖅᑕᖕᒐᓂ.

ᐅᓗᕆᐊᓇᖅᑑᖕᒋᑦᑐᓄ ᐃᓯᐅᖅᑲᖅᑕᐅᔪᐃᑦ ᐊᑦᑕᖅᕕᒃᒧ

- ᓄᓇᓕᒃᓂ ᐊᑦᑕᖅᕖᑦ ᓇᓗᓇᐃᔭᖅᑕᐅᓯᒪᔪᐃᑦ Hᐋᒻᓚᑦᑯᓐᓂ, ᐊᒪᓗ Hᐋᒻᓚᑦᑯ ᐊᑦᑎᕆᕋᑕᖅᑐ ᐱᓇᓱᐊᕈᓯᖅ ᐱᖕᒐᓱᐃᖅᑕᖅᓗᒍ ᐅᕙᓘᓐᓃᑦ ᓯᑕᒪᐃᖅᑕᖅᓗᒍ. ᑕᐃᒪᓗ ᑕᒪᒃᑯᐊ ᐃᓯᐅᖅᑲᖅᑕᐅᔪᐃᑦ ᐊᑦᑕᖅᕕᒃᒥ ᐊᑦᑕᐅᑎᒧ ᐃᓯᐅᖅᑲᖅᑕᐅᕋᑕᖅᑐ ᐊᒪᓗ ᑕᒪᒃᑯᐊᓪᓗ ᐅᓗᕆᐊᖅᓇᖅᑐᖅᑲᖅᐸ ᐃᓛᒃᑯᑦ ᐴᖅᑐᖅᑕᐅᓂᐊᖅᑐ ᐊᒪᓗ ᐊᐅᓪᓚᖅᑎᑕᐅᕋᑕᖅᓗᑎᓗ ᐴᖅᑐᖅᓯᒪᑎᐊᖅᓗᑎ.
- ᑕᒪᒃᑯᐊᓕ ᒥᑭᔫᑕᐅᔪᐃᑦ ᐊᑦᑕᖅᕕᒃᒥ ᐅᓗᕆᐊᓇᖕᒋᓐᓂᖅᓴᐅᔪᐃᑦ ᐳᐊᓇᑎᓕᒃᒧ ᓴᐅᔭᐅᓯᑕᖅᑐ ᑐᐊᐸᒃᒧ.
- ᐋᑐᓖᕕᓃᑦ ᐴᖅᑕᐅᓯᒪᕋᑕᖅᑐ ᐃᓖᒃᑯ ᐊᒪᓗ ᐴᖅᑕᐅᓯᒪᕋᑕᖅᓗᑎᓗ ᕿᔪᖁᑎᒥ ᕿᔪᐊᖅᔪᒃᒥ ᓴᓇᓯᒪᔪᓂ.

- ᐊᓕᓪᔨᐊᕐᓗ,ᐊᕐᓪᔨᑎᖅᓴᐊᕐᓗ, ᐅᖏᓐᓂᖅᓴᐊᕐᓗ ᖃᔨᐊᖅᔨᐊᕐᓗ ᐊᒪᓗ ᐊᓯᐅᓪᓕᔨᐊ ᖃᒥᑐᑎᑦ ᐃᑭᑎᑕᐅᕆᕋᖅᑐ ᐊᒪᓗ ᑕᒪᓂᐊ ᓂᖏᕕᓂᑦ ᓴᐅᕆᐅᕆᕋᖅᓄᑎᓗ.
- ᐅᑭᐅᖅᒥ ᓇᑦᓕᐅᒪᓂᖅᑯ ᖃᐅᔨᓴᐃᓂᖅ ᐃᒪᖅᒥ, ᑯᕐᕋᖅᑕᐅᕆᕋᖅᑐᖅᓗ ᐊᒪᓗ ᑕᒪᓂᐊ ᐃᑎᐅᖃᖅᑕᐅᕆᕋᖅᑐᐃ ᐊᐅᓕᐅᑎᑦᓗᑎᑦ ᐄᐊᒻᓕᑦᑯᓂ ᐅᒪᓴᐅᑎᐊᕆᕈᓕᐅᖅᑐᖅ ᐊᐅᓕᐅᑎᑦᓗᔪ-ᐅᑭᐊᖅᓱᖅᓗ. ᑕᐃᒪᓕ ᑲᑎᖅᓯᖅᑕᐅᓯᒪᔨᐃᑦ ᑕᐃᑲᖏᓐ ᓴᓐᓇᐃᐅᕆᕋᖅᑐᒥ ᐃᓕᑭᐅᑦᒪᒪ ᒪᓕᕆᓂᖅᓄ ᐊᒪᓗ ᐸᖅᓇᐅᑎᓄ ᐃᓕᓴᐅᓗᓂᓗ ᑕᐃᔪᖏᓐᓗ ᓯᓇᓗᒋᑦ ᖃᐅᔨᓴᖅᑕᐅᕆᕋᖅᑐ ᖃᐅᔨᓴᖅᑕᐅᓂᒃᑎᒥ.

Annual Report: 2018

NWB Form

Water Licence: 3BM-PEL1419

Date of issuance: May 14, 2014

Date of expiry: May 13, 2019

Hamlet of Kugaaruk, NU

ANNUAL REPORT

YEAR BEING REPORTED: 2018

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water Licence **3BM-PEL 1419** issued to the **Hamlet of Kugaaruk**
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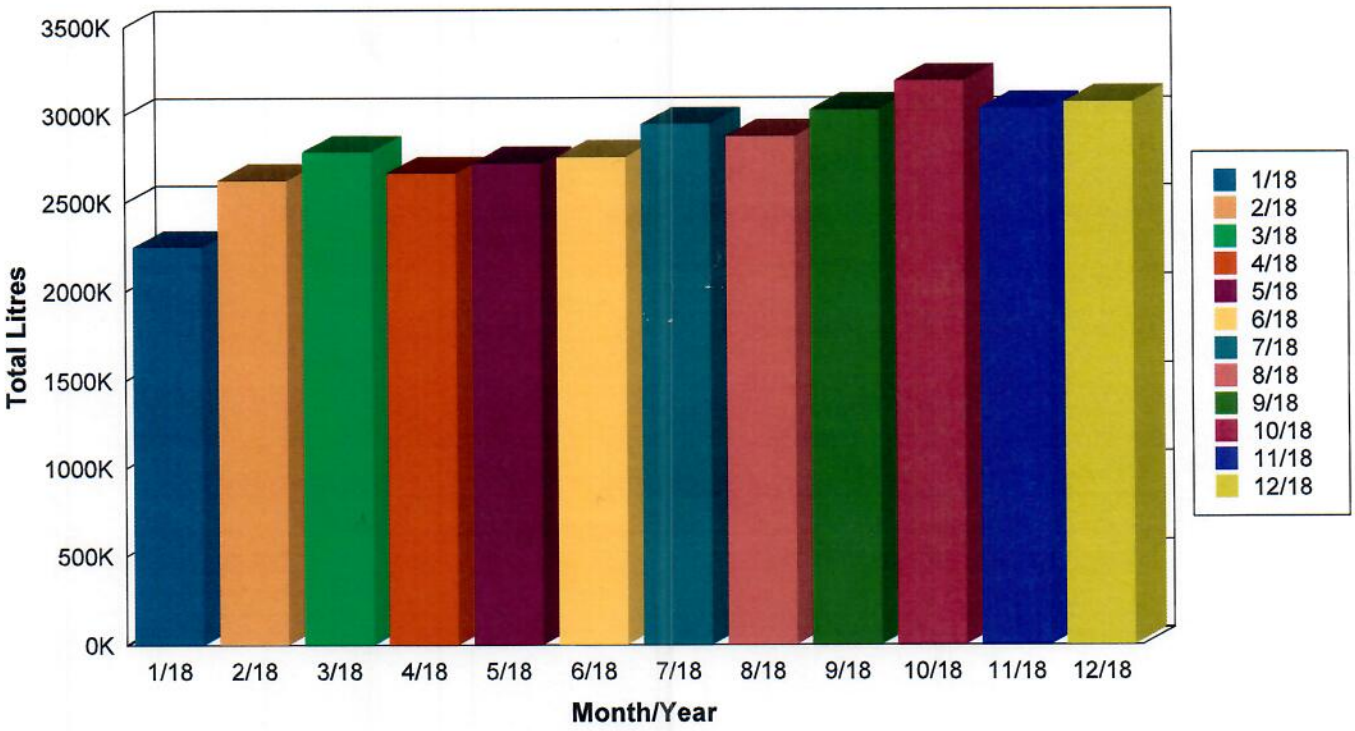
i) - iii) tabular summaries of all data generated under the "Monitoring Program"; monthly and annual quantities in cubic metres of freshwater obtained from all sources; monthly and annual quantities in cubic metres of each and all wastes discharged;

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	2,248,689.40	Same
February	2,624,408.60	Same
March	2,768,953.60	Same
April	2,665,191.10	Same
May	2,720,810.00	Same
June	2,757,657.80	Same
July	2,945,880.10	Same
August	2,875,464.00	Same
September	3,028,158.80	Same
October	3,190,236.10	Same
November	3,035,267.60	Same
December	3,070,411.60	Same
ANNUAL TOTAL	**33,949,128.70**	Same

Delivery Summary By Month and Year

Date Range From:Jan-08-2018 To: Dec-31-2018



Month / Year	Litres Delivered
January 2018	2,248,689.40
February 2018	2,624,408.60
March 2018	2,786,953.60
April 2018	2,665,191.10
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August 2018	2,875,464.00
September 2018	3,028,158.80
October 2018	3,190,236.10
November 2018	3,035,267.60
December 2018	3,070,411.60
Grand Total:	**33,949,128.70**

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

Water Treatment and supply:

- No major works for water treatment plant, but added a manually turn OFF/ON switch pad to the control Pendant outside the WTP to facilitate water truckfill operation.
- Cartage filters and UV tube lights were changes as part of treatment plant operation
- Localised potholes and rain cut eroded spots were levelled and patched by gravels at the truckfill area and along the berm of the WTP building.

Kugaaruk new Water Treatment Plant started operation since completed in Sep 2014, both for water intake and treatment system inside one building. The plant integrates:

- Twin intake lines of 300 mm HDPE casings with heat trace inside and connected to the cylindrical Screen (Johnson Screen) inside the Kugajuk River
- Twin pumps of 15 hp (Grundfos Canada) capable for water intake at a rate of 18.9 L/s,
- UV disinfection (Neotech) system with recirculation pumps of 0.41 L/s flow rate and Cartage filtration system ranging 10 M-1M in two trains,
- Intake control salinity sensor (Walchem), turbidity sensor (HF Scientific) & flow meter
- Auto dialling telephone system to transmit and alarm for operators,
- Chlorination with mixing tank (66 L) and holding tank (114 L)- two steps Cl2 dosing
- Generator for backup power (in old treatment building) when grid power (3p) fails
- Sanitary tank of 1200 L and domestic water tank of 114 L for plant building uses
- Two truckfill arms on both sides of the building - operation from outside / inside

Sewage and solid waste facilities:

- Graded solid waste facility access way to help water drainage and eroded spots using gravel-soil by hamlet operators.
- Cleaned up previous year's burn loose ashes from the metal tank incinerator, reinstate the gate door and uses for loose burn materials (paper products, light wood products, cloths, dry walls and insulation pieces, debris).
- Fence and gate materials for solid waste facility on site but waiting for metal posts.

Kugaaruk Solid waste facility built in 2008 and started operation for municipal waste storage. Until 2007, there was no specific system or organized place for solid waste storage and management. Household refuse was piled together with metal dump and hazardous waste. Since the operation in late 2008, solid waste and metal dump area were separated, fenced, isolated cells inside for hazardous waste, and established monitoring points for effluent sampling in compliance to environmental regulation. The hamlet has made some improvement time to time inside the facility including loose burning, waste segregation, packing and burying in trenches, hazardous waste and batteries securement

in C-cans, access and sides grading. The hamlet has planned to reinstate missing fence and gate which can be done in next year.

The sewage lagoon built in 2008 with raw sewage holding capacity 46,600 m3 inside for upto 12 months with the goal of serving 20 years (2008-2028). This improvement lagoon was built on the foot-print of the previous lagoon (small cell type) with bentonite liner on inner berm sides and keyed into 1m deep trench to permafrost, while the other end keyed inside the berm centre near the top. The liner was secured with gravels pitching in riprap and berm outer slope with gravel packing. Metal flume for raw sewage discharge into the lagoon from sewage truck and discharge annually from the lagoon to wetland when thaw in July–October. Meandering wetland helps polishing effluent before discharge to ocean.

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

- Leak continued at south side, and a new spot at the north side of the lagoon and spreading downwards on grassy-gravel surface during spring and summer thaws.
- Dillon Consultant had provided estimate and options for lagoon improvement and leak repair works. Funding shows a shortfall to get the construction contact out, but GN CGS is working for additional funding to complete the job once construction contact awarded.
- The AANDC inspector had concern of continuous leak issues and requested for taking effective steps to stop lagoon leak permanently or alternate measures for sewage waste.

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 facility abandoned during this year, but anticipated restoration completion of the lagoon structure and berm by the end of 2020 if multi-year contract involved.

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**;

Sewage lagoon has been leaking since 2014 and the Board had concern of the violation of environmental regulation. Although, berm leak is not indicating a failure of the lagoon but it is the violation of regulation. GN hired consultants has recommended for berm remediation, improvement and containment of effluent permanently. Consultant has submitted Class A estimates for improvement and expansion of lagoon capacity. Construction can be completed in a single year or in two years completion.

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

No specific request by the Board or other organization, but to monitor the leak effluent quality to stay in compliance as part of the Licence.

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

- No change to the previously approved O&M manuals of solid waste, metal dump, sewage lagoon(submitted 2010, updated in 2014), and water treatment plant (2014).
- Expected a change in sewage lagoon management when remediation contract starts.

ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

Trace debris and burnt metal parts from Kugaaruk school were placed inside the metal dump site finding no other facilities, and would be required either buried locally after broken in pieces or be shipped out by the contractor. The Hamlet has raised the concern to the school re-built project team and looking for a negotiation to support the reduction plan of those broken metal items either breaking on site and burry inside trenches or containment inside c-cans for shipping out. No funding arrangement yet provided.

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

Lagoon has been in operation without any issue since 2009 when upgraded on the old lagoon foot-print and with increased capacity for next 20 years. The first leak detected on a spot outside the south side berm in 2014. Assessment Report and samples test results by Stantec consultant has noted that effluent were above the allowable limit of contaminants. The Dam Safety Report by Stantec in 2016 noted the lagoon is stable and no immediate threat of failure, but continuous leak posing some risks (i) colossal (massive/immense) remediation work in the future and (ii) integrity of the dam - upon failure will have serious consequences on environment. The consultant has suggested to continue monitor the leak together with effluent sampling and keeping lagoon inside volume as low as possible until the remediation work starts.

Among other options, a full synthetic HDPE liner inside the lagoon base and sides were preferred and increase in berm height by another 0.5 m-1.0 m will increase the lagoon capacity suitable to contain at least 9-12 months raw sewage inside during the fall and winter. Dillon Consulting has designed the lagoon improvement work based on selected

best option and estimated the possible cost – CGS is working on the funding arrangement and possible tender out in March 2019 to hire contractor.

AANDC inspector has noted the leak concern and advised to make full containment of sewage water, continue annual decanting and sampling of leak effluent, in addition of lagoon water and wetland stations.

Community Kugaaruk 2018

Parameters			April 29, 2018			September 13, 2018		
	Units	**MAC**	**Raw (PEL 1)**	**WTP**	**Truckfill**	**Raw**	**WTP**	**Truckfill**
Colour	TCU	<=15	9	6	6	12	8	10
pH		7.0 - 10.5	7.09	7.27	7.25	7.91	7.71	7.89
Turbidity	NTU	<=5	0.33	0.35	0.25	0.92	0.42	0.78
TDS			84	92	86	72	66	76
TSS			3	4	3	< 3	< 3	< 3
Alkalinity			58.7	57.5	57.6	44.7	44.4	45.5
Conductivity			173	178	181	171	149	176
Dissolve C	mg/L	45	2.6	2.2	2.3			
Total C	mg/L		2.5	2.4	2.5	2.6	2	2.3
P, Total	mg/L							
Cyanide	mg/L	0.2	0.001	0.001	0.0014	< .0050	< 0.0050	< 0.0050
THMs	mg/L	0.1		0.014	0.017		0.0017	
Phenol, Tot			0.001	0.001	0.001	0.0011	< 0.0010	0.0012
Bromo-CH4				0.005	0.005		0.005	
Nitrate N	mg/L		0.18	0.22	0.12	0.19	0.25	0.08
Hardness	mg/L		64.3	63.8	65.1	78.6	69.5	82.8
Chloride	mg/L	<=250	15.6	16.8	17.7	19.9	15.2	21.5
Fluoride	mg/L		0.1	0.1	0.1			
Sodium	mg/L	<=200	7.3	8.2	8.7	9.4	7.2	8.3
Sulphate	mg/L	<=500	6	6	6	6	4	5
Magnesium			7.5	7.6	7.7	13	10.5	12.9
Calcium			13.3	13.1	13.4	10.1	10.5	12
Total Coli	CFU	none	1	1	1	28.8	< 1.0	< 1.0
E. Coli	CFU	none	1	1	1	< 1.0	< 1.0	< 1.0
Aluminium	µg/L	<100	2.2	6.5	9.8	56.9	22.2	38.2
Arsenic	µg/L	100	0.2	0.2	0.2	< 0.2	< 0.2	< 0.2
Barium	µg/L	1				2.9	2.8	3.5
Cadmium	µg/L	5	0.04	0.04	0.04	< 0.04	< 0.04	< 0.04
Chromium	µg/L	50	0.1	0.1	0.1	0.1	< 0.1	0.1
Copper	µg/L	<=1000	3.8	13	4.6	0.7	8.5	3.8
Iron	µg/L	<=300	68	40	52	83	31	74
Lead	µg/L	10				< 0.1	1.1	0.1
Manganese	µg/L	<=50	21.2	7.5	21.1	2.2	2.3	1
Selenium	µg/L	50	0.5	0.7	0.7	< 0.01		
Uranium	µg/L	20						
Zinc	µg/L	<=5000	16.5	183	10.9	0.4	62.9	47.5
Mercury	µg/L	1	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01
Nickel	µg/L		0.3	0.7	0.3	0.2	1	0.2

GCDWQ=Guidelines for Canadian Drinking Water Quality
IMAC=Interim maximum acceptable concentration
MAC=Maximum acceptable concentration
AO=Asthetic Objectives
ND=Not defined 1000 mg/L (ppm) µg = microgram

Enteric Protozoa:Giardia and Cryptosporidium. treatment goal:3 log removal inactivation of Cysts & Oocysts
Enteric Viruses: Treatment goal: minimum 4 log reduction (removal) an inactivation of Enteric viruses
Escherichia coli (E. C None detectable per 100 mL

Kugaaruk Sewage waste Effluent Results: 2018

Parameters	Units	MAC PEL-3	MAC PEL-4	July 11 2018					
				PEL 3-1 Decant	PEL 3-2 Outer cell	PEL-4 Final Disch	Pel-6 Solid Waste	PEL-7 Metal Waste	PEL-8 Metal Waste
Alkalinity	mg/L			302	277	179	196	23.6	24.6
Conductivity	µS/cm			967	772	596	821	97.2	99.3
P^h	p^h	6-9	6-9	7.42	7.52	7.52	7.45	7.59	7.43
TSS	mg/L	180	45	24	18	< 3	16	4	< 3
Ammonia as N_2	mg/L			204	42.3	22.0	1.67	< 0.005	< 0.005
BOD_5	mg/L	120	45	210	42	8	19	< 2	< 2
CBOD	mg/L								
Dissolved, C	mg/L								
Total, C	mg/L								
Nitrate as N_2	mg/L	45	45	0.37	0.37	3.75	0.38	0.12	0.11
Nitrite as N_2	mg/L	3	3	< 0.01	< 0.01	0.13	< 0.01	< 0.01	0.11
Calcium	mg/L	32	32	20.0	37.4	25.8	99.0	7.1	7.5
Chloride	mg/L	100	100	60.5	47.1	45.9	25.8	6.8	6.9
Hardness	mg/L	500	500	122	153	119	299	28.4	29.7
Magnesium	mg/L			17.4	14.6	13.2	12.6	2.6	2.7
Potassium	mg/L			66.0	42.2	31.5	10.7	1.0	1.1
Sodium	mg/L	200	200	48.0	38.5		35.4	6.7	6.8
Sulphate	mg/L	500	500	9	10		185	10	10
Total, Coliforms									
Escherichia Coli									
Fecal Coliform	CFU/100mL	$1x10^6$	$1x10^6$	$1.06x10^5$	$5x10^3$	5	$2.6x10^2$	< 1	< 1
Oil & Grease, Visible	Visibility			Non-Visible	Non-Visible	Non-Vislbe	Non-Visible	Non-Visible	Non-Visible
Total Phenols									
Benzene				< 0.002				0.002	< 0.002
Ethylbenzene				< 0.002				0.002	< 0.002
Toluene				0.086				0.002	< 0.002
Xylenes				< 0.002				0.002	<0.002
Aluminium	µg/L		200	5	5			5	0.6
Arsenic	µg/L		25	0.2	0.2			0.2	0.2
Barium									
Cadmium	µg/L		5	0.04	0.04			0.04	0.04
Chromium	µg/L		50	0.1	0.1			0.1	0.1
Cobalt	µg/L		50	0.1	0.1			0.1	0.1
Copper	µg/L		200	0.2	0.2			0.2	0.2
Iron	µg/L		500	5	5			5	5
Lead	µg/L		10	0.1	0.1			0.1	0.1
Manganese	µg/L		50	0.1	0.1				
Mercury									
Nickel	µg/L		200	0.1	0.1			0.1	0.1
Zinc	µg/L		500	5	5			5	0.4

Kugaaruk Sewage water and Effluent Results- 2018

Parameters	Units	MAC Limit PEL-3	MAC Limit PEL-4	August 2nd 2018					September 14th 2018				
				PEL 3-2 Decant sewage	PEL 4 Final Discharge	LSW Leak sewage	PEL-6 Solid waste	PEL-7 Metal dump	PEL 3-1 Lagoon Decant	PEL 3-2 Outer cell	PEL-4 Final Discharg	PEL-6 Solid Runoff	PEL-9 Metal Run-off
Alkalinity	mg/L			388	362	421	250	34.8	397	372	394	242	36.6
Conductivity	µS/cm			1160	1040	1230	671	153	1190	1080	1130	560	152
P^h	p^h	6-9	6-9	7.59	7.71	7.62	7.98	7.53	7.66	7.73	7.72	7.51	7.66
TSS	mg/L	180	45	20	18	32	4	16	22	14	16	6	< 3
Ammonia as N_2	mg/L								82.0	74	67.3	242	< 0.005
BOD_5	mg/L	120	45	19	19	20	5	< 2	236	175	76	4	< 2
CBOD	mg/L								378				
Dissolved, C	mg/L												
Total, C	mg/L			134	53.7	122	14.9	2.5	147	116	59.6		
Nitrate as N_2	mg/L	45	45	< 0.01	0.62	0.47	< 0.01		0.27	0.28	0.27	0.40	0.22
Nitrite as N_2	mg/L	3	3					2.3	< 0.01	< 0.01	< 0.01		
Calcium	mg/L	32	32	34.1	37.1	37.5	78.5		12.3	13.7	60.5	60.5	9.3
Chloride	mg/L	100	100	72.3	69.7	77.8	25.1	10.1	73.9	67.8	1.63	16.3	14.0
Hardness	mg/L	500	500	180	184	192	252	14.0	45.6	45.2	59.5	173	45.1
Magnesium	mg/L			23.1	22.1	23.9	13.7	4.2	3.6	2.6	2.9	5.3	5.3
Potassium	mg/L			63.0	51.0	62.5	9.6	1.3	14.7	9.7	15.3	7.0	1.6
Sodium	mg/L	200	200	60.1	64.3	72.3	34.6		38.9	35.0	48.8	25.2	7.4
Sulphate	mg/L	500	500	6	3	3	60		5	7	2	24	12
Total, Coliforms				> 2419.6	`	> 2419.6	> 2419.6	21.6					
Escherichia Coli				> 2419.6	> 2419.6	> 2419.6	12.2	< 1.0					
Fecal Coliform	CFU/100mL	$1x10^6$	$1x10^6$	2.4					$4.1x10^5$	$2.4x10^5$	$1.25x10^4$	52	1
Oil & Grease	Visibility								Non-Visible	Non-Visible	Non-Visible	Non-Visible	
Total Phenols				0.5430	0.2710	0.5880	0.001		0.5790	0.4390	0.3820	0.0037	< 0.001
Benzene					< 0.002		< 0.002					< 0.002	< 0.002
Ethylbenzene					< 0.002		< 0.002					< 0.002	< 0.002
Toluene					0.008		< 0.002					< 0.002	< 0.002
Xylenes					< 0.002		< 0.002					< 0.002	<0.002
Aluminium	µg/L		200	106		83.0	26.2		110	91.6	51.7	29.9	77.9
Arsenic	µg/L		25	1.3		2.9	0.7		1.0	0.9	1.8	0.5	< 0.2
Barium												19.8	6.2
Cadmium	µg/L		5	< 0.1		< 0.1	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chromium	µg/L		50	0.7		0.6	0.4		0.7	0.6	0.4	0.3	0.2
Cobalt	µg/L		50						0.7	0.8	1.6	1.1	< 0.1
Copper	µg/L		200	60.8		25.7	4.8		68.3	60.6	22.5	3.3	1.4
Iron	µg/L		500	802		1760	3930		865	842	1950	4320	115
Lead	µg/L		10	1.1		2.4	0.9		1.0	1.0	0.8	0.6	0.2
Manganese	µg/L		50	313		607	717		185	203	43	1280	2.4
Mercury				< 0.01		< 0.01	< 0.01		< 0.01	0.01	< 0.01	< 0.01	<0.01
Nickel	µg/L		200	2.9		4.2	2.4		2.5	2.3	3.5	1.7	0.3
Zinc	µg/L		500	45.5		23.9	122		52.4	43.8	16.4	223	9.7

AANDC Inspection Report- 2018

Water Licence: 3BM-PEL1419

Hamlet of Kugaaruk, NU

WATER LICENCE INSPECTION FORM

☒ **Original**
☐ **Follow-Up Report**

Licensee	**Licensee Representative**
Hamlet of Kugaaruk	John Ivey
Licence No. / Expiry	**Representative's Title**
3BM-PEL1419	Senior Administrative Officer
Land / Other Authorizations	**Land / Other Authorizations**
Date of Inspection	**Inspector**
11 July 2018	Baba Pedersen

Activities Inspected

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

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

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

Samples taken by Inspector:	Location(s): Hamlet and GN CGS Staff took Samples at Stations PEL-3-1, PEL-3-2, PEL-4, PEL-6, PEL-7 and PEL-8
☐ Yes ☒ No	

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

On July 11, 2018 I Inspected the Hamlet of Kugaaruk's Municipal Water License 3BM-PEL1419. I saw the Raw Water Intake and Pump Station, the Metal Dump, the Garbage Dump and the Sewage Lagoon as well as associated Sample Stations. I was accompanied by Sabrina Karnouk and Laura Kim of Environment Canada, Shah Alam of GN CGS and George, Etienne and Billy with the Hamlet of Kugaaruk.

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

At the Raw Water Intake & Pump Station I saw; 1. The Raw Water Flow Meter (Photo 1) and the Daily Log Sheets, 2. The PEL-1 Interior Sample Station (Photo 2), and 3. The PEL-1 Exterior Sample Station (Photo 3). At the Metal Dump I saw the 3 Celled Lined Berm Area with; 4. 2 Cells filled with Piles of Crushed Drums (Photo 4), and 5. 1 Cell filled with stacked Full Drums of Used Oils on Wooden Pallets (Photo 5), and 6. The Hamlet and GN Staff taking samples at PEL-7 (Photo 6). At the Garbage Dump I found it to be very Clean and Organized, 7. With Sealed Lined Wooden Crates of Discarded Batteries (Photo 7) stored within a Sea Can waiting to be sent South via Sealift for proper disposal. At the Sewage Lagoon; 8. I saw Leaks #1 & #2 (Photos 8 & 9) in the Sewage Lagoon Berm, and 9. That the Sewage Lagoon Level was very high (Photo 10), within 1 meter of the top.

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

1. The Hamlet has used just over 7,000 Cubic Meters of Water in a 2 ½ Month Period which is well within their 45,000 Cubic Meter Annual Allowable Limit. 2. Thank you for installing appropriate Signage as requested in last year's Inspection Report. 3. Thank you for installing appropriate Signage as requested in last year's Inspection Report. 4. The 2 Cells of Piled Crushed Drums are to be combined into 1 Cell. 5. In order to minimize the Risk Factor, the 3rd Empty Cell shall be filled with stacked Full Drums of Used Oils on Wooden Pallets. 6. Samples were taken by Hamlet and GN Staff at multiple locations, Thank You very much. 7. I applaud the Hamlet for this Recycling initiative in order to minimize the risk to the local environment. 8. The Hamlet and GN shall continue to work on and Monitor the 2 Leaks in the Sewage Lagoon Berm to try and find a permanent solution to this long ongoing issue. 9. The Sewage Lagoon MUST be Sampled and Decanted prior to Freeze Up.

Licensee or Representative	**Inspector's Name**
	Baba Pedersen
Signature	**Signature**
	Signed Original on File
Date	**Date**
	18 October 2018

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, Shah Alam, salam@gov.nu.ca

PHOTO LOG

Date	Camera	Inspector	Authorization
11 July 2018	Sony DSC-HX50V	Baba Pedersen	3BM-PEL1419

Photo Log # DSC02717 **Location: Raw Water Pump Station**

Photo 1

Description: Raw Water Flow Meter

Photo Log # DSC02718 **Location: Raw Water Pump Station**

Photo 2

Description: PEL-1 Interior Sample Station when River is Frozen – Nice Signage – Thank You

Photo Log # DSC02721	Location: Raw Water Pump Station

Photo 3

Description: PEL-1 Exterior Sample Station when River is NOT Frozen – Nice Signage – Thank You

Photo Log # DSC02740	Location: Metal Dump

Photo 4

Description: 2 Cells of Crushed Drums in the Lined Berm Area in the Metal Dump to be combined into 1 Cell

Photo Log # DSC02742	Location: Metal Dump

Photo 5

Description: 1 Cell of Stacked Full Drums of Used Oils in the Lined Berm Area

Photo Log # DSC02749	Location: Metal Dump

Photo 6

Description: Hamlet and GN CGS Staff taking Samples at Station PEL-7

Photo Log # DSC02754	Location: Garbage Dump

Photo 7

Description: Lined Wooden Crates of Discarded Batteries to be sent South for Disposal via 2018 Sea Lift Back Haul

Photo Log # DSC02767	Location: Sewage Lagoon

Photo 8

Description: View of Sewage Lagoon Leak #1 from top of Berm

Photo Log # DSC02761	Location: Sewage Lagoon

Photo 9

Description: View of Sewage Lagoon Leak #2 from top of Berm

Photo Log # DSC02776	Location: Sewage Lagoon

Photo 10

Description: Sewage Lagoon showing High Levels requiring Decanting