ᑕᓗᖅᓯᐅᑦ ᐄᐊᒪᓚᓪᓗᒃ
Hamlet of Taloyoak
PO Box 8
Taloyoak, Nunavut
X0B 1B0

Tel: 867-561-2300
Fax: 867-561-5057
Email: sao@taloyoak.ca

Annual Report -2017

Water Licence: 3BM-TAL 1419

Hamlet of Taloyoak, NU

Date submitted: Feb 28, 2018

Feb 26, 2018

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

Attention: Karen Kharatyan, PhD, Manager of Licensing

RE: Annual Report 2017 - Hamlet of Taloyoak Water Licence: 3BM-TAL 1419

Dear Mr. Karen,

The Hamlet of Taloyoak is pleased to submit to the Nunavut Water Board the enclosed file of "Annual Report 2017" of water uses and sewage solid waste disposal as required under the compliance of Water Licence; 3BM-TAL1419. Copies of required tests reports are attached herewith for your reference.

The Licensee remains in operation of those facilities and adhere the compliance requirements. Samples test result shown excellent remediation of contamination parameters within allowable limit comprising BOD, TSS, E-coli and Toxicity components and quality control on effluent.

We summarized those conditions and requirements outlined in Part B through part H in the NWB Form of Annual Report.

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

Best Regards,

Greg Holitzki
Senior Administrative Officer
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Hamlet of Taloyoak
P.O. Box 8
Taloyoak, NU X0B 1B0
☎: 867-561-2300
🖷: 867-561-5057

Cc:

Baba Pedersen, Resource Management Officer, AANDC

EXECUTIVE SUMMARY:

Hamlet of Taloyoak has prepared this Annual Report 2017 to submit to the Nunavut Water Board (NWB) meeting the requirements of the Nunavut Water Board Licence 3BM-TAL 1419, Part B General Conditions, through part H conditions to the monitoring program. This report covers the period from 01 January to 31 December 2017.

Water drawn from the Canso Lake through twin intake-pumps and delivered to the treatment plant where raw water is treated through a series of cartage filters ranging 20M – 1M followed by a chlorination system before truck-fill outside the building, then supply to household tanks by hamlet operated water trucks. Quantity of water uses about **41,734** m3, within the allowable limit (**60,000** annually).

Raw sewage collects from household sewage tanks using hamlet operated vacuum trucks, hauled to community sewage lagoon and discharge at the designated drop-off point. Raw sewage stays inside the lagoon during the period Sep - June for almost 10 months at freezing condition where it receives primary treatment naturally. The lagoon system consist of a primary and a secondary cell separated by a submerge berm which control raw sewage to sediment inside the primary cell first. Primary treated sewage water starts merging to wetland from the secondary cell during July-Sep when summer thaws. Samples collects from designated monitoring stations and test at Laboratory for Micro-biological, Bacterial, Physical, major Ions and trace Metal contents in accordance to requirements of the Licence.

Hazardous materials such as batteries, waste oil, waste paint drums and toxic products are secured inside seacan within the dump facility for shipping out. Non-hazardous waste disposed at the Solid waste facility using hamlet operated trucks and pushed down with grader and covered with sand-gravels and heavier substrates of waste. Loose wastes, papers, boxes, and light woods were burn onsite with control burning process to reduce waste bulks and wind flown. The Licensee used a 3rd party resource to clean and manage debris inside shallow trances and clean-up the vicinity of perimeter fence during the summer. Missing and non-visible signs at monitoring station TAL-4 and TAL-6 re-installed including the warning sing at the sewage facility entrance.

Water samples were send to EHO, Cambridge Bay for EC and TC test on a routine monthly basis and whenever necessary. No issues or concern to during this period.

The study project for sewage lagoon and wetland has completed earlier year and Final report by Dalhousie University has completed to standardize a system for Nunavut sewage lagoon system. The licensee is waiting for confirmation of GN Capital Projects for new lagoon design development or improvement of existing facility.

ANNUAL REPORT

YEAR BEING REPORTED: 2017

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water Licence **3BM-TAL 1419** issued to the **Hamlet of Taloyoak**
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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	3,449,250.00	Same
February	3,166,009.10	Same
March	3,495,215.00	Same
April	3,177,811.30	Same
May	3,200,346.90	Same
June	2,862,249.80	Same
July	3,183,552.60	Same
August	3,132,031.90	Same
September	3,652,179.00	Same
October	4,229,391.50	Same
November	4,102,214.60	Same
December	4,083,614.40	Same
ANNUAL TOTAL	41,733,866.10	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 supply: maintenance works

- Truckfill pipe (elbow arm) was partially frozen (noted Dec 20, 2017) and resolved the issue by placing sufficient insulation to the pipe (outer perimeter).
- Heat trace to one of the water intake pipe from Lake noticed has shorted out (Dec 12) and temporarily resolved, but will be verified and replaced (if needed) in summer time.
- Maintenance work carried out to flow control valve, chlorine dosing pumps, over-flow water pipe from inside tank
- Maintenance inspection and servicing carried to solar panels those were reported of non-responding to sun direction, are used to the alternative energy sources to the water plant.

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

No reported unauthorized discharge during this period and therefore, no action plan.

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(s) required or planned for abandonment during this period, but a plan for old WTP and accessories and old PH to be demolished in future with funding availability.

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;

A study report for existing sewage/wastewater management facility including wetland has completed in past year with opinion(s) of improvement or a new lagoon with operational cost-effective analysis. This project is on hold to Capital project priority list.
There is a plan for solid waste facility assessment and feasibility study for improvement in coming summer under GN Capital Projects new funding scope.

The community does not have a scope for spills materials storage or contaminated soil remediation. The municipality has identified one of the abandoned soil remediation cell used by the Nunavut Airport Authority, turned over and can be repurposed for Hamlet of Taloyoak soil remediation activities. A funding resource needs to be identified to upgrade the facility and an amendment application would be submitted to the NWB. Inclusion of this facility will be helpful for storage of HC materials from the current solid waste site.

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

No issues on water intake or supply from the new WTP, but a request for demolition of old WTP and accessories that is in Capital Plan priority list with a funding confirmation. This information has already updated with the Board with the future plan.
The community is working with the GN for an improvement of the sewage lagoon capacity and storage duration issue, which went to a study project and optioned for a cost-effective improvement or a new cell together with the existing facility. GN is looking for funding confirmation to go out for design and development contact.

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

- The existing O&M plans for water, sewage and solid waste facilities are active
- No changes or revision to O&M plan and facilities uses.
- The annual monitoring takes place with required sampling, signage, clean up and reporting as part of compliance to Licence and following the O&M plan.
- Operation of water Treatment plant requires changes of cartage filters and strainer:
  - 20M: 6-8 sets per year
  - 10M: 18-20 sets per year
  - 1M: 25-30 sets per year

75M strainer used at the entry to the treatment terrain from intake line to 1st cartage filter 20M is washed almost every day and switched to the standby one as needed.

- Hamlet is using 3-water trucks, 3-sewage trucks, 2-garbage trucks, 1-loader and 1-road maintainer with own operators in maintaining water, sewage, solid waste facilities and access roads.

X ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

A plan assessment and feasibility study of the solid waste facility for improvement to start in coming summer 2018 under a capital project. Bulk metals management, transportation and hazardous materials management will be integral to this proposed project.

Xi FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

ANNUAL REPORT

Inspection by the AANDC inspector on July 12, 2017 was acknowledged the update of facilities activities including:

- Replacement of air release valve to water intake lines for safety to freezing up
- Replacement of Flow-meter valve to ensure the volumetric measurement of intake

The licensee is aware of some concerns by the inspector which include:

- Needs to stentings of solid waste facility fence and gate to control wind-blown debris
- Proper cell for animal carcass burrier and protection of rotten leachate
- Addition of C-cans for battery, waste oil and hazardous materials storage and shipping
- Proper burning pit or trances to reduce lose debris.

The licensee is looking for cost-effective shipping facilities and proper recipient of waste batteries, waste oil, hazardous and toxic substances, including GN supports to deal with this matter and a central repository system.

Appendix: A

Water Test Reports 2017

Water Licence: 3BM-TAL 1419

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.: 170159

- FINAL REPORT -

Prepared For: Hamlet of Taloyoak

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

Attn: **Larry Banks** **Facsimile: 867-561-5057**

Final report has been reviewed and approved by:

Judy Mah
Client Service Officer

NOTES:

- Test methods and data are validated by the laboratory's Quality Assurance Program. Taiga Environmental Laboratory is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) to ISO/IEC 17025 as a testing laboratory for specific tests registered with CALA.
- Routine methods are based on recognized procedures from sources such as
  - 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: Tuesday, April 18, 2017
Print Date: ***Tuesday, April 18, 2017***

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

Taiga Batch No.: 170159

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Truck-fill **Taiga Sample ID:** 001

Client Project:
Sample Type: Potable Water
Received Date: 03-Apr-17
Sampling Date: 02-Apr-17
Sampling Time: 11:00
Location:
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Nitrogen, Dissolved	0.26	0.06	mg/L	04-Apr-17	ISO/TR 11905:1997(E)	
Nitrogen, Total	0.24	0.06	mg/L	04-Apr-17	ISO/TR 11905:1997(E)	
Organic Carbon, Dissolved	3.4	0.5	mg/L	07-Apr-17	SM5310:B	
Organic Carbon, Total	3.6	0.5	mg/L	07-Apr-17	SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	126	0.4	mg/L	03-Apr-17	SM2320:B	
Colour, Apparent	< 5	5	CU	03-Apr-17	SM2120:B	
Conductivity, Specific (@25C)	371	0.4	µS/cm	03-Apr-17	SM2510:B	
pH	7.77		pH units	03-Apr-17	SM4500-H:B	
Solids, Total Dissolved	200	10	mg/L	06-Apr-17	SM2540:C	
Solids, Total Suspended	< 3	3	mg/L	06-Apr-17	SM2540:D	
Turbidity	0.24	0.05	NTU	03-Apr-17	SM2130:B	
Major Ions						
Calcium	33.1	0.1	mg/L	04-Apr-17	SM4110:B	

ReportDate: Tuesday, April 18, 2017
Print Date: ***Tuesday, April 18, 2017***

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Taiga Batch No.: 170159

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Truck-fill **Taiga Sample ID:** 001

Chloride	32.1	0.7	mg/L	04-Apr-17	SM4110:B
Fluoride	0.1	0.1	mg/L	04-Apr-17	SM4110:B
Hardness	143	0.7	mg/L	04-Apr-17	SM4110:B
Magnesium	14.6	0.1	mg/L	04-Apr-17	SM4110:B
Nitrate as Nitrogen	0.24	0.01	mg/L	04-Apr-17	SM4110:B
Potassium	1.7	0.1	mg/L	04-Apr-17	SM4110:B
Sodium	20.1	0.1	mg/L	04-Apr-17	SM4110:B
Sulphate	16	1	mg/L	04-Apr-17	SM4110:B
Microbiology					
Coliforms, Total	< 1.0	1.0	MPN/100ml	03-Apr-17	SM9223:B
Escherichia coli	< 1.0	1.0	MPN/100ml	03-Apr-17	SM9223:B
Organics					
Bromodichloromethane	0.010	0.005	mg/L	07-Apr-17	EPA8260B
Bromoform	< 0.005	0.005	mg/L	07-Apr-17	EPA8260B
Chloroform	0.016	0.005	mg/L	07-Apr-17	EPA8260B
Dibromochloromethane	0.006	0.005	mg/L	07-Apr-17	EPA8260B
Trihalomethanes, Total	0.033	0.005	mg/L	07-Apr-17	EPA8260B
Subcontracted Organics					
Cyanide, Weak Acid Dissociable	< 0.0010	0.001	mg/L	12-Apr-17	APHA4500-CN
Phenols, Total	< 0.0010	0.001	mg/L	13-Apr-17	AB ENV.06537
Trace Metals, Total					
Aluminum	20.4	0.6	µg/L	03-Apr-17	EPA200.8
Antimony	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Arsenic	0.3	0.2	µg/L	03-Apr-17	EPA200.8
Barium	5.7	0.1	µg/L	03-Apr-17	EPA200.8

ReportDate: Tuesday, April 18, 2017
Print Date: *Tuesday, April 18, 2017*

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Taiga Batch No.: 170159

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Truck-fill **Taiga Sample ID:** 001

Beryllium	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Bismuth	< 0.2	0.2	µg/L	03-Apr-17	EPA200.8
Boron	19.1	0.9	µg/L	03-Apr-17	EPA200.8
Cadmium	< 0.05	0.05	µg/L	03-Apr-17	EPA200.8
Cesium	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Chromium	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Cobalt	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Copper	3.7	0.2	µg/L	03-Apr-17	EPA200.8
Iron	< 5	5	µg/L	03-Apr-17	EPA200.8
Lead	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Lithium	2.6	0.2	µg/L	03-Apr-17	EPA200.8
Manganese	0.5	0.1	µg/L	03-Apr-17	EPA200.8
Mercury	< 0.01	0.01	µg/L	03-Apr-17	EPA200.8
Molybdenum	0.9	0.1	µg/L	03-Apr-17	EPA200.8
Nickel	0.2	0.1	µg/L	03-Apr-17	EPA200.8
Rubidium	1.1	0.1	µg/L	03-Apr-17	EPA200.8
Selenium	< 0.3	0.3	µg/L	03-Apr-17	EPA200.8
Silver	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Strontium	65.2	0.1	µg/L	03-Apr-17	EPA200.8
Thallium	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Tin	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Titanium	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Uranium	0.6	0.1	µg/L	03-Apr-17	EPA200.8
Vanadium	0.2	0.1	µg/L	03-Apr-17	EPA200.8
Zinc	6.8	0.4	µg/L	03-Apr-17	EPA200.8

ReportDate: Tuesday, April 18, 2017
Print Date: *Tuesday, April 18, 2017*

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Taiga Batch No.: 170159

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Truck-fill **Taiga Sample ID:** 001

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Taiga Batch No.: 170159

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP inside **Taiga Sample ID:** 002

Client Project:
Sample Type: Potable Source Water
Received Date: 03-Apr-17
Sampling Date: 02-Apr-17
Sampling Time: 11:10
Location:
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Nitrogen, Dissolved	0.24	0.06	mg/L	04-Apr-17	ISO/TR 11905:1997(E)	
Nitrogen, Total	0.26	0.06	mg/L	04-Apr-17	ISO/TR 11905:1997(E)	
Organic Carbon, Dissolved	3.4	0.5	mg/L	07-Apr-17	SM5310:B	
Organic Carbon, Total	3.7	0.5	mg/L	07-Apr-17	SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	124	0.4	mg/L	03-Apr-17	SM2320:B	
Colour, Apparent	7	5	CU	03-Apr-17	SM2120:B	
Conductivity, Specific (@25C)	366	0.4	µS/cm	03-Apr-17	SM2510:B	
pH	7.71		pH units	03-Apr-17	SM4500-H:B	
Turbidity	0.17	0.05	NTU	03-Apr-17	SM2130:B	
Major Ions						
Calcium	32.4	0.1	mg/L	04-Apr-17	SM4110:B	
Chloride	30.7	0.7	mg/L	04-Apr-17	SM4110:B	
Fluoride	0.1	0.1	mg/L	04-Apr-17	SM4110:B	
Hardness	141	0.7	mg/L	04-Apr-17	SM4110:B	
Magnesium	14.5	0.1	mg/L	04-Apr-17	SM4110:B	

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Taiga Batch No.: 170159

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP inside **Taiga Sample ID:** 002

Nitrate as Nitrogen	0.22	0.01	mg/L	04-Apr-17	SM4110:B
Potassium	1.7	0.1	mg/L	04-Apr-17	SM4110:B
Sodium	19.6	0.1	mg/L	04-Apr-17	SM4110:B
Sulphate	16	1	mg/L	04-Apr-17	SM4110:B
Microbiology					
Coliforms, Total	< 1.0	1.0	MPN/100ml	03-Apr-17	SM9223:B
Escherichia coli	< 1.0	1.0	MPN/100ml	03-Apr-17	SM9223:B
Subcontracted Organics					
Cyanide, Weak Acid Dissociable	< 0.0010	0.001	mg/L	12-Apr-17	APHA4500-CN
Phenols, Total	< 0.0010	0.001	mg/L	13-Apr-17	AB ENV.06537
Trace Metals, Total					
Aluminum	< 0.6	0.6	µg/L	03-Apr-17	EPA200.8
Antimony	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Arsenic	0.3	0.2	µg/L	03-Apr-17	EPA200.8
Barium	5.7	0.1	µg/L	03-Apr-17	EPA200.8
Beryllium	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Bismuth	< 0.2	0.2	µg/L	03-Apr-17	EPA200.8
Boron	18.9	0.9	µg/L	03-Apr-17	EPA200.8
Cadmium	< 0.05	0.05	µg/L	03-Apr-17	EPA200.8
Cesium	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Chromium	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Cobalt	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Copper	1.0	0.2	µg/L	03-Apr-17	EPA200.8
Iron	< 5	5	µg/L	03-Apr-17	EPA200.8
Lead	0.2	0.1	µg/L	03-Apr-17	EPA200.8

ReportDate: Tuesday, April 18, 2017
Print Date: *Tuesday, April 18, 2017*

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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170159

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP inside **Taiga Sample ID:** 002

Lithium	2.7	0.2	µg/L	03-Apr-17	EPA200.8
Manganese	1.0	0.1	µg/L	03-Apr-17	EPA200.8
Mercury	< 0.01	0.01	µg/L	03-Apr-17	EPA200.8
Molybdenum	1.0	0.1	µg/L	03-Apr-17	EPA200.8
Nickel	0.2	0.1	µg/L	03-Apr-17	EPA200.8
Rubidium	1.2	0.1	µg/L	03-Apr-17	EPA200.8
Selenium	< 0.3	0.3	µg/L	03-Apr-17	EPA200.8
Silver	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Strontium	64.7	0.1	µg/L	03-Apr-17	EPA200.8
Thallium	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Tin	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Titanium	< 0.1	0.1	µg/L	03-Apr-17	EPA200.8
Uranium	0.6	0.1	µg/L	03-Apr-17	EPA200.8
Vanadium	0.2	0.1	µg/L	03-Apr-17	EPA200.8
Zinc	6.7	0.4	µg/L	03-Apr-17	EPA200.8

ReportDate: Tuesday, April 18, 2017
Print Date: *Tuesday, April 18, 2017*

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

Taiga Batch No.: 170159

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP inside **Taiga Sample ID:** 002

*** 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: Tuesday, April 18, 2017

Print Date: *Tuesday, April 18, 2017*

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

Taiga Batch No.: 170532

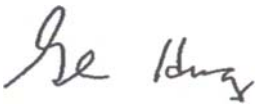
- FINAL REPORT -

Prepared For: Hamlet of Taloyoak

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

Attn: **Larry Banks** **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, July 31, 2017
Print Date: ***Tuesday, August 01, 2017***

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

Taiga Batch No.: 170532

- CERTIFICATE OF ANALYSIS -

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

Client Project: Taloyoak Water Supply
Sample Type: Raw Water
Received Date: 13-Jul-17
Sampling Date: 12-Jul-17
Sampling Time: 10:00
Location: TALOYOAK, NU
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Nitrogen, Total	0.21	0.06	mg/L	14-Jul-17	ISO/TR 11905:1997(E)	
Organic Carbon, Dissolved	3.3	0.5	mg/L	19-Jul-17	SM5310:B	
Organic Carbon, Total	3.3	0.5	mg/L	20-Jul-17	SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	89.1	0.4	mg/L	13-Jul-17	SM2320:B	
Colour, Apparent	8	5	CU	14-Jul-17	SM2120:B	
Conductivity, Specific (@25C)	249	0.4	µS/cm	13-Jul-17	SM2510:B	
pH	8.02		pH units	13-Jul-17	SM4500-H:B	
Solids, Total Dissolved	125	10	mg/L	15-Jul-17	SM2540:C	
Solids, Total Suspended	< 3	3	mg/L	15-Jul-17	SM2540:D	
Turbidity	0.43	0.05	NTU	13-Jul-17	SM2130:B	
Major Ions						
Calcium	22.7	0.1	mg/L	14-Jul-17	SM4110:B	
Chloride	20.5	0.7	mg/L	14-Jul-17	SM4110:B	

ReportDate: Monday, July 31, 2017
Print Date: ***Tuesday, August 01, 2017***

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

Taiga Batch No.: 170532

- CERTIFICATE OF ANALYSIS -

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

Fluoride	0.1	0.1	mg/L	14-Jul-17	SM4110:B
Hardness	98.4	0.7	mg/L	14-Jul-17	SM4110:B
Magnesium	10.1	0.1	mg/L	14-Jul-17	SM4110:B
Nitrate as Nitrogen	0.12	0.01	mg/L	14-Jul-17	SM4110:B
Nitrite as Nitrogen	< 0.01	0.01	mg/L	14-Jul-17	SM4110:B
Potassium	1.1	0.1	mg/L	14-Jul-17	SM4110:B
Sodium	13.2	0.1	mg/L	14-Jul-17	SM4110:B
Sulphate	10	1	mg/L	14-Jul-17	SM4110:B
Microbiology					
Coliforms, Fecal	1	1	CFU/100mL	13-Jul-17	SM9222:D
Subcontracted Organics					
Cyanide, Weak Acid Dissociable	< 0.0010	0.001	mg/L	23-Jul-17	APHA4500-CN
Phenols, Total	< 0.0010	0.001	mg/L	24-Jul-17	AB ENV.06537
Trace Metals, Total					
Aluminum	4.3	0.6	µg/L	20-Jul-17	EPA200.8
Arsenic	< 0.2	0.2	µg/L	20-Jul-17	EPA200.8
Barium	3.6	0.1	µg/L	20-Jul-17	EPA200.8
Cadmium	< 0.04	0.04	µg/L	20-Jul-17	EPA200.8
Chromium	< 0.1	0.1	µg/L	20-Jul-17	EPA200.8
Cobalt	< 0.1	0.1	µg/L	20-Jul-17	EPA200.8
Copper	1.9	0.2	µg/L	20-Jul-17	EPA200.8
Iron	9	5	µg/L	20-Jul-17	EPA200.8
Lead	0.2	0.1	µg/L	20-Jul-17	EPA200.8
Manganese	2.3	0.1	µg/L	20-Jul-17	EPA200.8
Mercury	< 0.01	0.01	µg/L	20-Jul-17	EPA200.8

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Taiga Batch No.: 170532

- CERTIFICATE OF ANALYSIS -

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

Nickel	0.1	0.1	µg/L	20-Jul-17	EPA200.8
Selenium	< 0.3	0.3	µg/L	20-Jul-17	EPA200.8
Zinc	7.0	0.4	µg/L	20-Jul-17	EPA200.8

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Taiga Batch No.: 170532

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP **Taiga Sample ID:** 002

Client Project: Taloyoak Water Supply
Sample Type: Treated Water
Received Date: 13-Jul-17
Sampling Date: 12-Jul-17
Sampling Time: 10:00
Location: TALOYOAK, NU
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Nitrogen, Total	0.25	0.06	mg/L	14-Jul-17	ISO/TR 11905:1997(E)	
Organic Carbon, Dissolved	3.3	0.5	mg/L	19-Jul-17	SM5310:B	
Organic Carbon, Total	3.2	0.5	mg/L	20-Jul-17	SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	98.0	0.4	mg/L	13-Jul-17	SM2320:B	
Colour, Apparent	8	5	CU	14-Jul-17	SM2120:B	
Conductivity, Specific (@25C)	276	0.4	µS/cm	13-Jul-17	SM2510:B	
pH	7.86		pH units	13-Jul-17	SM4500-H:B	
Solids, Total Dissolved	121	10	mg/L	15-Jul-17	SM2540:C	
Solids, Total Suspended	< 3	3	mg/L	15-Jul-17	SM2540:D	
Turbidity	0.26	0.05	NTU	13-Jul-17	SM2130:B	
Major Ions						
Calcium	25.3	0.1	mg/L	14-Jul-17	SM4110:B	
Chloride	23.7	0.7	mg/L	14-Jul-17	SM4110:B	
Fluoride	0.1	0.1	mg/L	14-Jul-17	SM4110:B	
Hardness	109	0.7	mg/L	14-Jul-17	SM4110:B	

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Taiga Batch No.: 170532

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP **Taiga Sample ID:** 002

Magnesium	11.1	0.1	mg/L	14-Jul-17	SM4110:B
Nitrate as Nitrogen	0.14	0.01	mg/L	14-Jul-17	SM4110:B
Nitrite as Nitrogen	< 0.01	0.01	mg/L	14-Jul-17	SM4110:B
Potassium	1.3	0.1	mg/L	14-Jul-17	SM4110:B
Sodium	14.9	0.1	mg/L	14-Jul-17	SM4110:B
Sulphate	12	1	mg/L	14-Jul-17	SM4110:B
Microbiology					
Coliforms, Fecal	< 1	1	CFU/100mL	13-Jul-17	SM9222:D
Organics					
Bromodichloromethane	0.007	0.005	mg/L	25-Jul-17	EPA8260B
Bromoform	< 0.005	0.005	mg/L	25-Jul-17	EPA8260B
Chloroform	< 0.005	0.005	mg/L	25-Jul-17	EPA8260B
Dibromochloromethane	< 0.005	0.005	mg/L	25-Jul-17	EPA8260B
Trihalomethanes, Total	0.012	0.005	mg/L	25-Jul-17	EPA8260B
Subcontracted Organics					
Cyanide, Weak Acid Dissociable	< 0.0010	0.001	mg/L	23-Jul-17	APHA4500-CN
Phenols, Total	< 0.0010	0.001	mg/L	24-Jul-17	AB ENV.06537
Trace Metals, Total					
Aluminum	3.4	0.6	µg/L	20-Jul-17	EPA200.8
Arsenic	< 0.2	0.2	µg/L	20-Jul-17	EPA200.8
Barium	4.1	0.1	µg/L	20-Jul-17	EPA200.8
Cadmium	< 0.04	0.04	µg/L	20-Jul-17	EPA200.8
Chromium	< 0.1	0.1	µg/L	20-Jul-17	EPA200.8
Cobalt	< 0.1	0.1	µg/L	20-Jul-17	EPA200.8
Copper	15.6	0.2	µg/L	20-Jul-17	EPA200.8

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Taiga Batch No.: 170532

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP **Taiga Sample ID:** 002

Iron	5	5	µg/L	20-Jul-17	EPA200.8
Lead	0.5	0.1	µg/L	20-Jul-17	EPA200.8
Manganese	1.3	0.1	µg/L	20-Jul-17	EPA200.8
Mercury	< 0.01	0.01	µg/L	20-Jul-17	EPA200.8
Nickel	0.4	0.1	µg/L	20-Jul-17	EPA200.8
Selenium	< 0.3	0.3	µg/L	20-Jul-17	EPA200.8
Zinc	34.0	0.4	µg/L	20-Jul-17	EPA200.8

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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170532

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Truck Fill **Taiga Sample ID:** 003

Client Project: Taloyoak Water Supply
Sample Type: Treated Water
Received Date: 13-Jul-17
Sampling Date: 12-Jul-17
Sampling Time: 10:00
Location: TALOYOAK, NU
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Nitrogen, Total	0.22	0.06	mg/L	14-Jul-17	ISO/TR 11905:1997(E)	
Organic Carbon, Dissolved	3.4	0.5	mg/L	19-Jul-17	SM5310:B	
Organic Carbon, Total	3.2	0.5	mg/L	20-Jul-17	SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	88.5	0.4	mg/L	13-Jul-17	SM2320:B	
Colour, Apparent	5	5	CU	14-Jul-17	SM2120:B	
Conductivity, Specific (@25C)	249	0.4	µS/cm	13-Jul-17	SM2510:B	
pH	8.09		pH units	13-Jul-17	SM4500-H:B	
Solids, Total Dissolved	146	10	mg/L	15-Jul-17	SM2540:C	
Solids, Total Suspended	< 3	3	mg/L	15-Jul-17	SM2540:D	
Turbidity	0.37	0.05	NTU	13-Jul-17	SM2130:B	
Major Ions						
Calcium	22.8	0.1	mg/L	14-Jul-17	SM4110:B	
Chloride	20.8	0.7	mg/L	14-Jul-17	SM4110:B	
Fluoride	< 0.1	0.1	mg/L	14-Jul-17	SM4110:B	
Hardness	97.9	0.7	mg/L	14-Jul-17	SM4110:B	

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Taiga Batch No.: 170532

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Truck Fill **Taiga Sample ID:** 003

Magnesium	9.9	0.1	mg/L	14-Jul-17	SM4110:B
Nitrate as Nitrogen	0.14	0.01	mg/L	14-Jul-17	SM4110:B
Nitrite as Nitrogen	< 0.01	0.01	mg/L	14-Jul-17	SM4110:B
Potassium	1.1	0.1	mg/L	14-Jul-17	SM4110:B
Sodium	13.2	0.1	mg/L	14-Jul-17	SM4110:B
Sulphate	10	1	mg/L	14-Jul-17	SM4110:B
Microbiology					
Coliforms, Fecal	< 1	1	CFU/100mL	13-Jul-17	SM9222:D
Organics					
Bromodichloromethane	0.007	0.005	mg/L	25-Jul-17	EPA8260B
Bromoform	< 0.005	0.005	mg/L	25-Jul-17	EPA8260B
Chloroform	0.007	0.005	mg/L	25-Jul-17	EPA8260B
Dibromochloromethane	< 0.005	0.005	mg/L	25-Jul-17	EPA8260B
Trihalomethanes, Total	0.016	0.005	mg/L	25-Jul-17	EPA8260B
Subcontracted Organics					
Cyanide, Weak Acid Dissociable	< 0.0010	0.001	mg/L	23-Jul-17	APHA4500-CN
Phenols, Total	< 0.0010	0.001	mg/L	24-Jul-17	AB ENV.06537
Trace Metals, Total					
Aluminum	23.2	0.6	µg/L	20-Jul-17	EPA200.8
Arsenic	< 0.2	0.2	µg/L	20-Jul-17	EPA200.8
Barium	3.8	0.1	µg/L	20-Jul-17	EPA200.8
Cadmium	< 0.04	0.04	µg/L	20-Jul-17	EPA200.8
Chromium	0.2	0.1	µg/L	20-Jul-17	EPA200.8
Cobalt	< 0.1	0.1	µg/L	20-Jul-17	EPA200.8
Copper	22.1	0.2	µg/L	20-Jul-17	EPA200.8

ReportDate: Monday, July 31, 2017
Print Date: *Tuesday, August 01, 2017*

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Taiga Batch No.: 170532

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Truck Fill **Taiga Sample ID:** 003

Iron	32	5	µg/L	20-Jul-17	EPA200.8
Lead	0.1	0.1	µg/L	20-Jul-17	EPA200.8
Manganese	2.3	0.1	µg/L	20-Jul-17	EPA200.8
Mercury	< 0.01	0.01	µg/L	20-Jul-17	EPA200.8
Nickel	0.1	0.1	µg/L	20-Jul-17	EPA200.8
Selenium	< 0.3	0.3	µg/L	20-Jul-17	EPA200.8
Zinc	7.6	0.4	µg/L	20-Jul-17	EPA200.8

ReportDate: Monday, July 31, 2017
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Taiga Batch No.: 170532

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Truck Fill **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, July 31, 2017

Print Date: *Tuesday, August 01, 2017*

Appendix: B

Sewage Effluent Reports 2017

Water Licence: 3BM-TAL 1419

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.: 170530

- FINAL REPORT -

Prepared For: Hamlet of Taloyoak

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

Attn: **Larry Banks** **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: Tuesday, August 01, 2017
Print Date: ***Tuesday, August 01, 2017***

Taiga Environmental Laboratory
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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170530

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-2 **Taiga Sample ID:** 001

Client Project: Taloyoak Sewage and Solid Waste
Sample Type: Sewage Lagood
Received Date: 13-Jul-17
Sampling Date: 12-Jul-17
Sampling Time: 11:00
Location: TALOYOAK, NU
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Biochemical Oxygen Demand	265	2	mg/L	13-Jul-17	SM5210:B	
CBOD	41	2	mg/L	13-Jul-17	SM5210:B	81
Organic Carbon, Dissolved	26.1	0.5	mg/L	19-Jul-17	SM5310:B	
Organic Carbon, Total	90.6	0.5	mg/L	20-Jul-17	SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	285	0.4	mg/L	13-Jul-17	SM2320:B	
Conductivity, Specific (@25C)	919	0.4	µS/cm	13-Jul-17	SM2510:B	
pH	7.66		pH units	13-Jul-17	SM4500-H:B	
Solids, Total Suspended	162	3	mg/L	15-Jul-17	SM2540:D	
Major Ions						
Calcium	46.8	0.1	mg/L	14-Jul-17	SM4110:B	
Chloride	93.2	0.7	mg/L	14-Jul-17	SM4110:B	
Hardness	203	0.7	mg/L	14-Jul-17	SM4110:B	
Magnesium	20.9	0.1	mg/L	14-Jul-17	SM4110:B	

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Taiga Batch No.: 170530

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-2 **Taiga Sample ID:** 001

Nitrate as Nitrogen	0.45	0.01	mg/L	14-Jul-17	SM4110:B
Nitrite as Nitrogen	< 0.01	0.01	mg/L	14-Jul-17	SM4110:B
Potassium	18.3	0.1	mg/L	14-Jul-17	SM4110:B
Sodium	70.5	0.1	mg/L	14-Jul-17	SM4110:B
Sulphate	40	1	mg/L	14-Jul-17	SM4110:B
Microbiology					
Coliforms, Fecal	456000	1000	CFU/100mL	13-Jul-17	SM9222:D
Organics					
Benzene	< 0.002	0.002	mg/L	22-Jul-17	EPA8260B
Ethylbenzene	< 0.002	0.002	mg/L	22-Jul-17	EPA8260B
F2: C10-C16	< 0.2	0.2	mg/L	28-Jul-17	EPA8015B
F3: C16-C34	0.3	0.2	mg/L	28-Jul-17	EPA8015B
F4: C34-C50	< 0.2	0.2	mg/L	28-Jul-17	EPA8015B
Hydrocarbons, Total Extractable	0.5	0.2	mg/L	28-Jul-17	EPA8015B
Oil and Grease, visible	Non-visible			13-Jul-17	Visual Exam
Toluene	< 0.002	0.002	mg/L	22-Jul-17	EPA8260B
Xylenes	< 0.002	0.002	mg/L	22-Jul-17	EPA8260B
Subcontracted Organics					
Phenols, Total	0.0013	0.001	mg/L	24-Jul-17	AB ENV.06537
Trace Metals, Total					
Aluminum	307	5	µg/L	20-Jul-17	EPA200.8
Arsenic	1.0	0.2	µg/L	20-Jul-17	EPA200.8
Cadmium	< 0.1	0.1	µg/L	20-Jul-17	EPA200.8
Chromium	1.0	0.1	µg/L	20-Jul-17	EPA200.8
Cobalt	0.5	0.1	µg/L	20-Jul-17	EPA200.8

ReportDate: Tuesday, August 01, 2017
Print Date: *Tuesday, August 01, 2017*

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Taiga Batch No.: 170530

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-2 **Taiga Sample ID:** 001

Copper	48.1	0.2	µg/L	20-Jul-17	EPA200.8
Iron	533	5	µg/L	20-Jul-17	EPA200.8
Lead	1.4	0.1	µg/L	20-Jul-17	EPA200.8
Manganese	45.4	0.1	µg/L	20-Jul-17	EPA200.8
Mercury	< 0.01	0.01	µg/L	20-Jul-17	EPA200.8
Nickel	2.4	0.1	µg/L	20-Jul-17	EPA200.8
Silver	0.1	0.1	µg/L	20-Jul-17	EPA200.8
Zinc	55.4	5	µg/L	20-Jul-17	EPA200.8

ReportDate: Tuesday, August 01, 2017
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Taiga Environmental Laboratory
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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170530

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-3 **Taiga Sample ID:** 002

Client Project: Taloyoak Sewage and Solid Waste
Sample Type: Lagoon to Wetland
Received Date: 13-Jul-17
Sampling Date: 12-Jul-17
Sampling Time: 11:00
Location: TALOYOAK, NU
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Biochemical Oxygen Demand	121	2	mg/L	13-Jul-17	SM5210:B	
Organic Carbon, Total	93.1	0.5	mg/L	20-Jul-17	SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	145	0.4	mg/L	13-Jul-17	SM2320:B	
Conductivity, Specific (@25C)	739	0.4	µS/cm	13-Jul-17	SM2510:B	
pH	9.17		pH units	13-Jul-17	SM4500-H:B	
Solids, Total Suspended	75	3	mg/L	15-Jul-17	SM2540:D	
Major Ions						
Calcium	38.4	0.1	mg/L	14-Jul-17	SM4110:B	
Chloride	120	0.7	mg/L	14-Jul-17	SM4110:B	
Hardness	163	0.7	mg/L	14-Jul-17	SM4110:B	
Magnesium	16.2	0.1	mg/L	14-Jul-17	SM4110:B	
Nitrate as Nitrogen	0.10	0.01	mg/L	14-Jul-17	SM4110:B	
Nitrite as Nitrogen	< 0.01	0.01	mg/L	14-Jul-17	SM4110:B	
Potassium	19.9	0.1	mg/L	14-Jul-17	SM4110:B	
Sodium	80.8	0.1	mg/L	14-Jul-17	SM4110:B	

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Taiga Batch No.: 170530

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-3 **Taiga Sample ID:** 002

Sulphate	41	1	mg/L	14-Jul-17	SM4110:B	
Microbiology						
Coliforms, Fecal	20	10	CFU/100mL	13-Jul-17	SM9222:D	
Organics						
F2: C10-C16		0.2	mg/L		EPA8015B	16
F3: C16-C34		0.2	mg/L		EPA8015B	16
F4: C34-C50		0.2	mg/L		EPA8015B	16
Hydrocarbons, Total Extractable		0.2	mg/L		EPA8015B	16
Oil and Grease, visible	Non-visible			13-Jul-17	Visual Exam	
Subcontracted Organics						
Phenols, Total	0.0034	0.001	mg/L	24-Jul-17	AB ENV.06537	
Trace Metals, Total						
Aluminum	533	5	µg/L	20-Jul-17	EPA200.8	
Arsenic	2.0	0.2	µg/L	20-Jul-17	EPA200.8	
Cadmium	< 0.1	0.1	µg/L	20-Jul-17	EPA200.8	
Chromium	1.9	0.1	µg/L	20-Jul-17	EPA200.8	
Cobalt	0.7	0.1	µg/L	20-Jul-17	EPA200.8	
Copper	16.3	0.2	µg/L	20-Jul-17	EPA200.8	
Iron	1160	5	µg/L	20-Jul-17	EPA200.8	
Lead	1.1	0.1	µg/L	20-Jul-17	EPA200.8	
Manganese	44.9	0.1	µg/L	20-Jul-17	EPA200.8	
Mercury	< 0.01	0.01	µg/L	20-Jul-17	EPA200.8	
Nickel	3.1	0.1	µg/L	20-Jul-17	EPA200.8	
Silver	0.2	0.1	µg/L	20-Jul-17	EPA200.8	
Zinc	27.1	5	µg/L	20-Jul-17	EPA200.8	

ReportDate: Tuesday, August 01, 2017
Print Date: *Tuesday, August 01, 2017*

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

Taiga Batch No.: 170530

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-3 **Taiga Sample ID:** 002

ReportDate: Tuesday, August 01, 2017
Print Date: *Tuesday, August 01, 2017*

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Taiga Batch No.: 170530

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-4 **Taiga Sample ID:** 003

Client Project: Taloyoak Sewage and Solid Waste
Sample Type: Solid Waste Runoff
Received Date: 13-Jul-17
Sampling Date: 12-Jul-17
Sampling Time: 11:00
Location: TALOYOAK, NU
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Biochemical Oxygen Demand	21	2	mg/L	13-Jul-17	SM5210:B	55
CBOD	20	2	mg/L	13-Jul-17	SM5210:B	
Organic Carbon, Total	134	0.5	mg/L	20-Jul-17	SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	693	0.4	mg/L	13-Jul-17	SM2320:B	
Conductivity, Specific (@25C)	4310	0.4	µS/cm	13-Jul-17	SM2510:B	
pH	7.80		pH units	13-Jul-17	SM4500-H:B	
Solids, Total Suspended	5	3	mg/L	15-Jul-17	SM2540:D	
Major Ions						
Calcium	393	0.1	mg/L	14-Jul-17	SM4110:B	
Chloride	479	0.7	mg/L	14-Jul-17	SM4110:B	
Hardness	1470	0.7	mg/L	14-Jul-17	SM4110:B	
Magnesium	119	0.1	mg/L	14-Jul-17	SM4110:B	
Nitrate as Nitrogen	0.36	0.01	mg/L	14-Jul-17	SM4110:B	
Nitrite as Nitrogen	0.35	0.01	mg/L	14-Jul-17	SM4110:B	
Potassium	118	0.1	mg/L	14-Jul-17	SM4110:B	

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Taiga Batch No.: 170530

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-4 **Taiga Sample ID:** 003

Sodium	414	0.1	mg/L	14-Jul-17	SM4110:B	
Sulphate	1030	1	mg/L	14-Jul-17	SM4110:B	
Microbiology						
Coliforms, Fecal	180	10	CFU/100mL	13-Jul-17	SM9222:D	
Organics						
Benzene	< 0.002	0.002	mg/L	22-Jul-17	EPA8260B	
Ethylbenzene	< 0.002	0.002	mg/L	22-Jul-17	EPA8260B	
F2: C10-C16	< 0.2	0.2	mg/L	28-Jul-17	EPA8015B	
F3: C16-C34	< 0.2	0.2	mg/L	28-Jul-17	EPA8015B	
F4: C34-C50	< 0.2	0.2	mg/L	28-Jul-17	EPA8015B	
Hydrocarbons, Total Extractable	< 0.2	0.2	mg/L	28-Jul-17	EPA8015B	
Oil and Grease, visible	Non-visible			13-Jul-17	Visual Exam	
Toluene	< 0.002	0.002	mg/L	22-Jul-17	EPA8260B	
Xylenes	< 0.002	0.002	mg/L	22-Jul-17	EPA8260B	
Subcontracted Organics						
Phenols, Total	0.0320	0.010	mg/L	24-Jul-17	AB ENV.06537	207
Trace Metals, Total						
Aluminum	69.4	5	µg/L	20-Jul-17	EPA200.8	
Arsenic	5.9	0.2	µg/L	20-Jul-17	EPA200.8	
Cadmium	< 0.1	0.1	µg/L	20-Jul-17	EPA200.8	
Chromium	6.0	0.1	µg/L	20-Jul-17	EPA200.8	
Cobalt	2.0	0.1	µg/L	20-Jul-17	EPA200.8	
Copper	14.6	0.2	µg/L	20-Jul-17	EPA200.8	
Iron	2740	5	µg/L	20-Jul-17	EPA200.8	
Lead	0.5	0.1	µg/L	20-Jul-17	EPA200.8	

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Taiga Batch No.: 170530

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-4 **Taiga Sample ID:** 003

Manganese	2320	0.1	µg/L	20-Jul-17	EPA200.8
Mercury	0.04	0.01	µg/L	20-Jul-17	EPA200.8
Nickel	15.1	0.1	µg/L	20-Jul-17	EPA200.8
Silver	< 0.1	0.1	µg/L	20-Jul-17	EPA200.8
Zinc	83.2	5	µg/L	20-Jul-17	EPA200.8

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Taiga Batch No.: 170530

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-6 **Taiga Sample ID:** 004

Client Project: Taloyoak Sewage and Solid Waste
Sample Type: Effluent Water
Received Date: 13-Jul-17
Sampling Date: 12-Jul-17
Sampling Time: 11:00
Location: TALOYOAK, NU
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Biochemical Oxygen Demand	11	2	mg/L	13-Jul-17	SM5210:B	
CBOD	10	2	mg/L	13-Jul-17	SM5210:B	
Organic Carbon, Total	48.4	0.5	mg/L	20-Jul-17	SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	343	0.4	mg/L	13-Jul-17	SM2320:B	
Conductivity, Specific (@25C)	1070	0.4	µS/cm	13-Jul-17	SM2510:B	
pH	8.11		pH units	13-Jul-17	SM4500-H:B	
Solids, Total Suspended	< 3	3	mg/L	15-Jul-17	SM2540:D	
Major Ions						
Calcium	80.7	0.1	mg/L	14-Jul-17	SM4110:B	
Chloride	138	0.7	mg/L	14-Jul-17	SM4110:B	
Hardness	378	0.7	mg/L	14-Jul-17	SM4110:B	
Magnesium	42.9	0.1	mg/L	14-Jul-17	SM4110:B	
Nitrate as Nitrogen	0.52	0.01	mg/L	14-Jul-17	SM4110:B	
Nitrite as Nitrogen	1.47	0.01	mg/L	14-Jul-17	SM4110:B	
Potassium	9.1	0.1	mg/L	14-Jul-17	SM4110:B	

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Taiga Batch No.: 170530

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-6 **Taiga Sample ID:** 004

Sodium	90.8	0.1	mg/L	14-Jul-17	SM4110:B	
Sulphate	33	1	mg/L	14-Jul-17	SM4110:B	
Microbiology						
Coliforms, Fecal	< 1	1	CFU/100mL	13-Jul-17	SM9222:D	
Organics						
Benzene		0.002	mg/L		EPA8260B	111
Ethylbenzene		0.002	mg/L		EPA8260B	111
F2: C10-C16	< 0.2	0.2	mg/L	28-Jul-17	EPA8015B	
F3: C16-C34	< 0.2	0.2	mg/L	28-Jul-17	EPA8015B	
F4: C34-C50	< 0.2	0.2	mg/L	28-Jul-17	EPA8015B	
Hydrocarbons, Total Extractable	< 0.2	0.2	mg/L	28-Jul-17	EPA8015B	
Oil and Grease, visible	Non-visible			13-Jul-17	Visual Exam	
Toluene		0.002	mg/L		EPA8260B	111
Xylenes		0.002	mg/L		EPA8260B	111
Subcontracted Organics						
Phenols, Total	< 0.0010	0.001	mg/L	24-Jul-17	AB ENV.06537	
Trace Metals, Total						
Aluminum	12.5	5	µg/L	20-Jul-17	EPA200.8	
Arsenic	1.4	0.2	µg/L	20-Jul-17	EPA200.8	
Cadmium	< 0.1	0.1	µg/L	20-Jul-17	EPA200.8	
Chromium	0.3	0.1	µg/L	20-Jul-17	EPA200.8	
Cobalt	0.2	0.1	µg/L	20-Jul-17	EPA200.8	
Copper	2.2	0.2	µg/L	20-Jul-17	EPA200.8	
Iron	404	5	µg/L	20-Jul-17	EPA200.8	
Lead	0.1	0.1	µg/L	20-Jul-17	EPA200.8	

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Taiga Batch No.: 170530

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-6 **Taiga Sample ID:** 004

Manganese	38.5	0.1	µg/L	20-Jul-17	EPA200.8
Mercury	< 0.01	0.01	µg/L	20-Jul-17	EPA200.8
Nickel	1.2	0.1	µg/L	20-Jul-17	EPA200.8
Silver	< 0.1	0.1	µg/L	20-Jul-17	EPA200.8
Zinc	< 5.0	5	µg/L	20-Jul-17	EPA200.8

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- CERTIFICATE OF ANALYSIS -

Client Sample ID: TAL-6 **Taiga Sample ID:** 004

- DATA QUALIFERS -

Data Qualifier Descriptions:

111	*Vial contained air bubble, analysis not possible*
16	*Test requested but no sample bottle received*
207	*Detection limit adjusted due to sample matrix effects*
55	*BOD result is inconclusive; residual DO was less than 1 mg/L. For evaluation purposes only.*
81	*Results are inconclusive due to insufficient depletion of sample, minimum 2 mg/L required over 5 days.*

*** 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

Appendix: C

Part B-H of Water Licence

Water Licence: 3BM-TAL 1419

Hamlet of Taloyoak, NU

b. All inspection and enforcement services regarding this Licence will be provided by Inspectors appointed under the *Act*; and

c. For the purpose of enforcing this Licence and with respect to the use of water and deposit or discharge of waste by the Licensee, Inspectors appointed under the *Act*, hold all powers, privileges and protections that are conferred upon them by the *Act* or by other applicable law.

PART B: GENERAL CONDITIONS

1. The Licensee shall file an Annual Report on the Appurtenant Undertaking with the Board no later than March 31st of the year following the calendar year being reported, containing the following information:

   a. tabular summaries of all data generated under the "Monitoring Program";
   b. summary of modifications to the "Monitoring Program" in accordance with Part H, Item 13;
   c. the daily, monthly and annual quantities in cubic metres of freshwater obtained from all sources;
   d. the daily, monthly and annual quantities in cubic metres of each and all waste discharged; including the hazardous and non-hazardous waste accepted at the Solid Waste Facilities;
   e. a summary of modifications and/or major maintenance work carried out on the Water Supply and Waste Disposal Facilities, including all associated structures and facilities;
   f. a list of unauthorized discharges and summary of follow-up action taken;
   g. a summary of any abandonment and restoration work completed during the year and an outline of any work anticipated for the next year;
   h. 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;
   i. a summary of any studies, reports and plans requested by the Board that relate to waste disposal, water use or reclamation, and a brief description of any future studies planned;
   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 H, Item 1.

6. The Licensee shall, post the necessary signs, where possible, to identify the stations of the "Monitoring Program". All signage postings shall be in the Official Languages of Nunavut, and shall be located and maintained to the satisfaction of an Inspector.

7. The Licensee shall immediately report to the 24-Hour Spill Report Line at (867) 920-8130, any spills of Waste, which are reported to, or observed by the Licensee, within the municipal boundaries or in the areas of the Water Supply or Waste Disposal Facilities.

8. The Licensee shall implement the Plan entitled "Plan for Compliance Licence No. 3BM-TAL0813" updated September 16, 2014 that was submitted as additional information within the Application and has been approved by the Board.

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

10. The Licensee shall, for all Plans submitted under this Licence, implement the Plan as approved by the Board in writing.

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

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

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

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

(b) Inspector Contact:

Manager of Field Operations, AANDC
Nunavut District, Nunavut Region
P.O. Box 100
Iqaluit, NU X0A 0H0
Telephone: (867) 975-4295
Fax: (867) 979-6445

14. The Licensee shall submit one paper copy and one electronic copy of all reports, studies, and plans to the Board. Reports or studies submitted to the Board by the Licensee shall include a detailed executive summary in Inuktitut.

15. 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.

16. This Licence is assignable as provided for in Section 44 of the *Act*.

PART C: CONDITIONS APPLYING TO WATER USE

1. The Licensee shall obtain all freshwater from Canso Lake using the Water Supply Facilities or as otherwise approved by the Board in writing.

2. The annual quantity of water use for all purposes under this Licence shall not exceed sixty thousand (60,000) cubic metres *per* year or two hundred and forty eight (248) cubic metres *per* day.

3. Where the use of water is of a sufficient volume that the source Water body may be drawn down, the Licensee shall submit to the Board for approval in writing the following: the volume required a hydrological overview of the water body, details of impacts, and proposed mitigation measures.

4. The Licensee shall maintain the Water Supply Facilities to the satisfaction of the Inspector.

5. The Licensee shall equip all water intake hoses with a screen of appropriate mesh size to ensure that fish are not entrained and shall withdraw water at a rate such that fish do not become impinged on the screen.

6. The Licensee shall not remove any material from below the ordinary High Water Mark of any water body unless approved by the Board in writing.

7. The Licensee shall not cause erosion to the banks of any body of water and shall provide necessary controls to prevent such erosion.

8. Sediment and erosion control measures shall be implemented prior to and maintained as required during Hamlet operations, to prevent entry of sediment into water.

PART D: CONDITIONS APPLYING TO WASTE DISPOSAL

1. The Licensee shall direct all Sewage to the Sewage Disposal Facilities or as otherwise approved by the Board.

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

3. All Effluent discharged from the Sewage Disposal Facilities at Monitoring Program Station TAL-3 shall meet the following effluent quality standards:

Parameter	Maximum Concentration of any Grab Sample
PH	Between 6 and 9
Faecal Coliforms	1×10^6 CFU/dl
BOD_5	120 mg/L
Total Suspended Solids	180 mg/L
Oil and grease	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	Maximum Concentration of any Grab Sample
PH	Between 6 and 9
Total Suspended Solids	15 mg/L
Oil and grease	No visible sheen
Aluminum	1 mg/L
Arsenic	1 mg/L
Barium	1 mg/L
Cadmium	0,1 mg/L
Chromium	0,1 mg/L
Iron	1 mg/L
Lead	0,05 mg/L
Zinc	0,5 mg/L

5. A Freeboard limit of at least 1.0 metre, or as recommended by a qualified Geotechnical Engineer and as approved by the Board in writing, shall be maintained at all dams, dykes, or structures intended to contain, withhold, divert or retain water or wastes.

6. The Sewage Disposal Facility shall be maintained and operated, to the satisfaction of an Inspector 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. Identify the Final Discharge Point as required to complete monitoring requirements under Part D, Item 9;

    ii. An 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 filed by the Licensee on August 12, 2013; and;

    iii. A 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	**Maximum Concentration of any Grab Sample**
CBOD	25 mg/L
Total Suspended Solids	25 mg/L
Un-ionized Ammonia (NH_3)	1.25 mg/L, as nitrogen (N) at 15°C ± 1°C
Faecal Coliforms	1×10^4 CFU/dl
Oil and grease	No visible sheen
PH	Between 6 and 9

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 Environment Canada's Environmental Protection Series Biological Test Method EPS/1/RM/13); and

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

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

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

PART E: CONDITIONS APPLYING TO MODIFICATION AND CONSTRUCTION

1. The Licensee shall submit to the Board for approval, for construction drawings stamped and signed by a qualified Engineer registered in Nunavut, sixty (60) days prior to the construction of any dams, dykes or structures intended to contain, withhold, divert or retain water or wastes.

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

    a. the Licensee has notified the Board in writing of such proposed Modifications at least sixty (60) days prior to beginning the Modifications;
    b. such Modifications do not place the Licensee in contravention of the Licence or the *Act*;
    c. the Board has not, during the sixty (60) days following notification of the proposed Modifications, informed the Licensee that review of the proposal will require more than sixty (60) days; and
    d. the Board has not rejected the proposed Modifications.

3. The Modifications for which all of the conditions referred to in Part E, Item 2(a) through (d), have not been met, may only be carried out upon written approval from the Board.

4. The Licensee shall, within ninety (90) days of completion of Modification or Construction of facilities and/or infrastructure associated with the project, submit to the Board a Construction Summary Report along with stamped as-built plans and drawings, providing explanation to reflect any deviations from for construction drawings taking into account construction and field decisions and how they may affect the performance of engineered facilities.

5. All activities shall be conducted in such a way as to minimize impacts on surface drainage and the Licensee shall immediately undertake any corrective measures in the event of any impacts on surface drainage.

6. The Licensee shall implement and maintain sediment and erosion control measures prior to and during activities carried out under this Part, to prevent impacts to water resulting

from the release of sediment and to minimize erosion.

7. With respect to earthworks, the deposition of debris or sediment into or onto any water body is prohibited. These materials shall be disposed a distance of at least thirty-one (31) metres from the ordinary High Water Mark in such a fashion that they do not enter the water.

8. The Licensee shall use material that is free of contaminants for construction, operation, and maintenance activities and that is obtained from approved sources and has been demonstrated not to be potentially acid generating and metal leaching.

PART F: CONDITIONS APPLYING TO OPERATION AND MAINTENANCE

1. The Board has approved the Plan entitled: "Operation and Maintenance Manual for the Water Treatment Plant at Taloyoak, Nunavut", dated May 2012 and submitted as additional information within the renewal Application. The Licensee shall submit an updated Plan for Board review by March 31, 2015 to take into consideration, at a minimum, the comments received during the review of Application and to provide Spill Contingency Planning within the Water Supply Facilities.

2. The Board has approved the Plan entitled: "Hamlet of Taloyoak, Nunavut, Sewage Treatment Facility Operation and Maintenance (O&M) Plan", dated August 10, 2014 and submitted as additional information within the renewal Application. The Licensee shall submit an updated Plan for Board review by March 31, 2015 to take into consideration, at a minimum, the comments received during the review of Application and to make the Plan consistent with Licence Monitoring Program.

3. The Board has approved the Plan entitled: "Hamlet of Taloyoak, Nunavut, Solid Waste Facility Operation and Maintenance (O&M) Plan", dated October 24, 2014, and submitted as additional information within the renewal Application. The Licensee shall submit an updated Plan for Board review by March 31, 2015 to take into consideration, at a minimum, the comments received during the review of Application and to make the Plan consistent with Licence Monitoring Program requirements. The updated Plan shall also provide detailed management plan and procedures regarding the Hazardous Waste.

4. An inspection of all engineered facilities related to the management of water and waste shall be carried by an Engineer (Civil, Municipal or Geotechnical) annually and before commissioning any facility. 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 addressing each of the Engineer's recommendations.

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

6. If, during the period of this Licence, an unauthorized discharge of waste occurs, or if such

a discharge is foreseeable, the Licensee shall:

a. employ the appropriately approved Spill Contingency Plan for the Hamlet of Taloyoak. Take whatever steps are immediately practicable to protect human life, health and the environment;
b. report the incident immediately via the 24-Hour Spill Reporting Line at (867) 920-8130 and to the AANDC Manager of Field Operations at (867) 975-4295; and
c. submit to the Inspector, a detailed report on each occurrence, not later than thirty (30) days after initially reporting the event, that provides the necessary information on the location (including the GPS coordinates), initial response action, remediation/clean-up, status of response (ongoing, complete), proposed disposal options for dealing with contaminated materials and any preventative measures to be implemented.

PART G: CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION

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

   a. water intake facilities;
   b. the water treatment and waste disposal sites and facilities;
   c. abandoned water and waste facilities;
   d. petroleum and chemical storage areas;
   e. any site affected by waste spills;
   f. leachate prevention;
   g. an implementation schedule;
   h. maps delineating all disturbed areas, and site facilities;
   i. consideration of altered drainage patterns;
   j. type and source of cover materials;
   k. future area use; and
   l. hazardous wastes.

2. The Licensee shall submit to the Board for approval, by March 31, 2015, an Abandonment and Restoration (A&R) Plan for the old Water Treatment Facility.

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 carry out progressive reclamation of any components of the project no longer required for the Licensee's operations.

5. 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.

6. Areas that have been contaminated by hydrocarbons shall be reclaimed to meet objectives as outlined in the Government of Nunavut's Environmental Guideline for Site Remediation, January 2002. The use of reclaimed soils for the purpose of back fill or general site grading may be carried out only upon consultation and approval by the Government of Nunavut, Department of Environment and an Inspector.

PART H: CONDITIONS APPLYING TO THE MONITORING PROGRAM

1. The Licensee shall maintain Monitoring Program Stations at the following locations:

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

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

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

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

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

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

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

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

6. 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.

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

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 in 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 Plans shall be submitted to the Board with a current approval letter from an accredited lab and shall meet the standards set out in Part H, Item 8 and Part H, Item 9 of the Licence.

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

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

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