CITY OF IQALUIT

WATER LICENCE 3AM-IQA1626

2020 ANNUAL WATER LICENCE REPORT

MARCH 31, 2021

EXECUTIVE SUMMARY

Under a Type A Water Licence 3AM-IQA1626 (the Licence), the City of Iqaluit (the City):

- Extracts water from Lake Geraldine for municipal use;
- Discharges Landfill run-off from the West 40 Landfill; and
- Discharges wastewater from the West 40 Wastewater Treatment Plant and backup Sewage Lagoon.

This Licence was issued by the Nunavut Water Board (NWB) in 2016 and expires on June 16, 2026. The City was granted an amendment to the Licence (Amendment No. 4) on December 2, 2019, by the NWB, which came into effect on April 1, 2020.

This Annual Water Licence Report summarizes the activities conducted by the City in 2020, pursuant to the requirements stipulated in Schedule B of the Licence.

Monitoring Program

As part of the Licence conditions, the City is required to develop and implement an Environmental Monitoring Program and Quality Assurance/ Quality Control Plan (the Monitoring Plan). The plan considers the sampling the influent and effluent water at the Water Treatment Plant and Wastewater Treatment Plant, as well as the Wastewater Treatment Plant's lagoon.

Long-Term Water Supply and Storage

Under Amendment No. 4, the City is permitted to withdraw to total of 2,000,000 m³ of water. In 2020, the City estimates that it withdrew approximately 1,040,740 m^3 of water from the Lake Geraldine Reservoir.

The Long-Term Water Pre-Feasibility Study was completed in 2020. The intent was to investigate viable alternatives to meet future City demand requirements. A recommended option was identified, presented to City of Iqaluit Council, and endorsed by Council in November 2020. The recommended option consisted of a combination of excavation and berming of a hydraulically independent reservoir adjacent to Lake Geraldine.

The City initiated a water balance assessment of Unnamed Lake in 2020 to confirm its long-term viability as a supplemental water supply source. The assignment will be completed in March 2021.

The City engaged WSP in August 2020 to conduct a fish and fish habitat assessment of Unnamed Lake in order to qualify the presence of fish within the reservoir and the impacts of potential future water withdrawal may have on resident fish population. The assignment will be completed in March 2021.

The assignments noted above will serve as intermediate steps for the larger Preliminary Engineering Design Study for the Long-Term Water Project. The Preliminary Engineering Design Study will consider the technical, constructability, environmental, and economic viability of Unnamed Lake as a supply source to the Lake Geraldine and adjacent independent reservoirs.

Niaqunguk River (Apex River) Supplementary Pumping Program

The City executed the replenishment of the Lake Geraldine Reservoir, via supplemental pumping of water from the Apex River. Pumping activities were completed between June

21, 2020 and July 28, 2020. A total of 358,615 m³ of water was pumped with daily pumped volumes ranging from 0 to 17,520 m³. No supplementary pumping occurred between July 29 and October 2, 2020, when Lake Geraldine water level was recorded at 111.16 mASL.

Wastewater Treatment

In 2020, the City estimates that it discharged approximately 999,770 m^3 of effluent from the Wastewater Treatment Plant. It also estimates that it removed approximately 1,227.45 m^3 of sludge from the Wastewater Treatment Plant, which was deposited at the City's West 40 Landfill.

The primary treatment system remains in operation following its commissioning in 2019. Construction of the secondary treatment system was completed in March 2020 and initial commissioning commenced at that time. With the COVID-19 pandemic escalating across Canada shortly after, the Contractor responsible for the work made the decision to demobilize staff from Iqaluit on March 18, 2020 before commissioning activities and deficiency corrections were fully completed. Primary Treatment continues to function with partial secondary treatment through Moving Bed Biofilm Reactor (MBBR) tanks and flow-through the new Dissolved Air Flotation (DAF) tanks.

Solid Waste Management

The Road to the Northwest Deposit design was completed prior to the summer of 2020. A contractor was successfully retained to carry out construction activities for the road. Approximately 2 km of the road was completed in 2020, with the remainder of the road anticipated to be constructed in 2021.

The 100% design package for both the new landfill and the waste transfer station components of the Solid Waste Facility Upgrades project was completed in 2020 and submitted to the Nunavut Water Board for review. Construction of both facilities is planned to begin during the summer of 2021.

The City continues to accept and manage waste at the West 40 Landfill – this will be continued until the construction of the new landfill and waste transfer station is completed in 2023.

Lake Geraldine Dam

In 2020, the City retained Meco Engineering to develop a Dam Safety Management Plan. to the objective was to establish a framework to reduce risk of failure and inadequate functionality, while also providing a means to respond to events that are unplanned. The final plan was submitted to the City on July 16, 2020.

Concentric Associates International Inc. was also retained to conduct a Dam Safety Inspection in 2020 in order to ensure adherence to the Canadian Dam Safety Guidelines and to identify priority items to be included in a repair and upgrades program in 2021.

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2020–ᒥ, ᓄᑎᖅᓄᑦ ᐱᓕᕆᔨᒪᔭᕆᔪᑦ ᒥᑲ ᖃᐅᔨᓚᑦᑐᑦ ᓴᓪᒥᐊᓕᓕᐅᑎᓄᑦ (Meco Engineering) ᕿᖏᐅᑎᓕᐅᖏᓄᓪᓕᐅᑦ ᐃᒥᖅᑕᖏᕐᕕᐅᕐ ᓴᐅᔪᑕᖓᓂᑦ ᐊᑦᑕᓇᑦᑕᐃᓕᒪᐅᑎᓂᑦ ᐊᐅᓪᓕᑎᓄᕐᓴᓂᑦ. ᐱᓕᕆᓄᕐᓂᐅᕐᒪᓪᓕᐅᕐᒥᒃ ᒥᑭᓕᓕᐊᕐᑎᑦᓴᓂᑦ ᐅᓪᓗᐊᓇᕐᓇᖏᓐᓄᓪᓕᑦ ᖃᓄᑎᒥ ᓄᖏᑦᑕᓂᖅᕿᑦ ᐊᒻᒪ ᐊᐅᓪᓕᑦᑕᐅᑦᑎᐊᕐᓂᓂᖅᕿᑦ, ᐊᑕᐅᑦᑎᓄᑦ ᐱᓕᕆᓄᕐᓄᓕᕐᓇᓪᑎᓄ ᖃᓄᐃᓕᓂᐅᕐᒪᑎᓂᑦ ᖃᓄᐃᓕᓕᔪᖃᑦᑕᓂᖅᕿᑦ ᕿᖏᐅᑕᐅᓕᒫᓐᓇᑦᑕᑐᓂᑦ. ᑭᓯᓕᓂᖅᕿᖅ ᕿᖏᐅᑎᓕᐊᖏᓪᓕᐅᖅᑐᖅ ᓄᑎᖅᓄᓪᓚᐅᑦᑐᖅᑕᐅᓂᑦ ᐃᓚᐃ 16, 2020.

ᑲᓛᓐᑐᓗᒃ ᑲᑐᔨᖃᑎᑎᑦ (Concentric Associates International Inc.) ᐱᓕᓗᑎᑕᐅᓕᐅᖏᒥᔪᑦ ᓴᓪᔨᑐᑕᐅᕐᕕᐊᑦᑕᓇᑦᑕᐃᓕᒪᐅᑎᖓᓐᓂᑦ ᖃᐅᔨᓴᖃᑎᑕᐅᑐᓂᒃ 2020–ᒥ ᓇᓗᓇᐃᔪᒪᙱᓘᑎᒃ ᒪᓕᑦᑎᐊᖏᓐᓂᑦᑐᑦ ᑲᓇᑕᒥ ᓴᓪᔨᑐᓂᐃᑦ ᐊᑦᑕᓇᑦᑕᐃᓕᓕᒪᐅᑎᖓᓐᓂᑦᑐᑦ ᒪᓕᑎᑦᑐᑦ ᐊᒻᒪ ᓇᓗᓇᐃᕆᐃᖏᕐᓂᑎᒃ ᐱᖃᓕᐅᖕᖏᐅᕆᓇᐊᓕᓕᑦᑐᑦ ᐱᓕᓇᐊᑦᓴᑦ ᐱᓕᕆᔨᖏᑦᑐᑦ ᐊᖏᔪᒥ 2021.

INTRODUCTION

In June 2016, the City of Iqaluit (the City) was issued Water Licence number 3AM-IQA1626 (the Licence) by the Nunavut Water Board (NWB). This licence was issued for a ten-year period concluding in June 2026. The City was granted an amendment to the Licence (Amendment No. 4) on December 2, 2020 in order to allow for the supplementation of water from the Apex River to the Lake Geraldine reservoir.

A requirement of the Licence is an annual report due March 31 of each year, summarizing activities governed by the Licence for the previous calendar year. In accordance with Schedule B of the Water Licence, this Annual Water Licence Report summarizes the activities conducted by the City of Iqaluit in 2020.

ANALYSIS

A. The monthly and annual quantities in cubic metres of fresh water withdrawn from the Lake Geraldine Reservoir (Monitoring Station No. IQA-01).

Table 1 summarizes the estimated monthly and annual quantities of water drawn from Lake Geraldine, the City of Iqaluit's raw water source. The total water usage for 2020 was 1,040,740 cubic metres, which is slightly below the maximum allowable usage of 1,100,000 cubic metres. As per Amendment No. 4, which took effect on April 1, 2020, the City is authorized to withdraw 2,000,000 cubic metres of water annually from Lake Geraldine.

Table 1 Raw Water Drawn from Lake Geraldine Reservoir (2020)

Month	Volume (m^3)
January	96,110
February	94,090
March	98,350
April	94,320
May	96,390
June	92,140
July	88,860
August	72,960
September	73,040
October	78,950
November	75,750
December	79,780
Total 2020	**1,040,740**

B. The monthly and annual quantities in cubic metres of any discharges from the Wastewater Treatment Facilities (Monitoring Stations No. IQA-02, IQA-04, IQA-08).

Table 2 summarizes the monthly and annual quantities of discharge from the City of Iqaluit's Wastewater Treatment Plant (WWTP) in 2020.

Table 2 Discharge from the WWTP Treatment Plant (2020)

Month	Volume (m^3)
January	9,710
February	76,170
March	93,900
April	93,260
May	99,650
June	97,080
July	104,960
August	90,600
September	80,580
October	92,240
November	79,680
December	81,940
Total 2020	**999,770**

Following the completion of construction activities to the secondary treatment process in March 2020, both the primary and secondary treatment processes were in operation at the WWTP. This is indicative of the increase in effluent discharge from January to March 2020, as shown in Table 2. Commissioning activities, originally planned for April 2020, were paused as a result of the COVID-19 pandemic. The City is planning to complete commissioning of the secondary treatment process by the end of March 2021.

C. Reports generated from Dam Safety Inspections and Dam Safety Reviews and proposed actions to address issues identified and/or updates on continuing actions to address issues.

To address outstanding recommendations related to the Lake Geraldine Dam, the City developed a Dam Safety Management Plan and conducted a Dam Safety Inspection in 2020. The purpose of the Inspection is to verify the dam's compliance with requirements of the Canadian Dam Safety Guidelines, which is regulated by the Canadian Dam Association (CDA). This is required annually, while a Dam Safety Review is required every 5 years.

Lake Geraldine Dam Safety Management Plan

The City has developed a new Dam Safety Management Plan with the goal of reducing risk of failure and inadequate functionality while also providing a means to respond to events that are unplanned. It describes the overall management

system and provides a framework for dam safety activities, decisions, and supporting processes. The following items are included in the Plan:

- Dam safety management system
- Dam safety policy
- Gap analysis
- Recommendations
- Compiled permanent record file that includes:
    - Operations and maintenance surveillance manual
    - Emergency preparedness plan and emergency response plan
    - Record design and construction information
    - Record maintenance information
    - Record Dam Safety Inspection and Review reports

This Dam Safety Management Plan was developed by Meco Engineering and submitted to the City on July 16, 2020.

Lake Geraldine Dam Safety Inspection

Concentric Associates International Inc. was retained to conduct a Dam Safety Inspection in 2020. The inspection was conducted on November 30, 2020 and submitted on December 22, 2020. The purpose of the DSI is to assist the City by identifying any visual changes in the condition of the dam, identifying any new concerns, and making recommendations on maintenance, repairs, or further investigations. It is conducted in order to ensure adherence to the Canadian Dam Safety Guidelines.

The DSI produced the following recommendations that are planned to be implemented in 2021:

- Update and maintain the permanent record file
- Conduct a DSI during the summer months of 2021
- Restock aggregate stockpiles
- Install automated monitoring equipment
- Re-grade and repair the crest of berms
- Re-grade and repair access roads

The recommendations above have been included in the scope of work for City of Iqaluit capital project *Lake Geraldine Dam Safety Improvements*. The project has been prioritized for execution under the 2021 Capital Plan. It is anticipated that work will be completed by Q4-2021.

D. The monthly and annual quantities in cubic metres of sludge removed from the Wastewater Treatment Facility.

Table 3 summarizes the monthly and annual quantities of sludge removed from the City of Iqaluit's Wastewater Treatment Plant (WWTP) in 2020 and disposed of at the City's West 40 Landfill.

Table 3 Sludge removed from the WWTP Treatment Plant (2020)

Month	Volume (m^3)

January	103.68
February	96.99
March	103.68
April	103.68
May	103.68
June	100.34
July	103.68
August	103.68
September	100.34
October	103.68
November	100.34
December	103.68
Total 2020	**1,227.45**

On average, approximately 102.3 cubic metres of sludge was removed from the WWTP on a monthly basis and deposited at a designated area in the West 40 Landfill. This equated to an annual total of approximately 1,227.45 cubic metres of sludge deposited at the West 40 Landfill.

E. The monthly and annual quantities of waste disposed of at the West 40 Landfill.

A survey and assessment of airspace consumption of the West 40 Landfill was completed on August 17, 2020 by City consultant AECOM. The airspace consumption compares the waste surface from October 7, 2019, to August 17, 2020, and includes deposited waste and cover soil placement.

The remaining landfill airspace is determined by comparing the surveyed waste surface to the proposed final landfill cap design.

Table 4 summarizes the airspace consumption survey data for the period of October 7, 2019, to August 17, 2020.

Table 4 Waste disposed at the West 40 Landfill (2020)

Total Airspace Consumed	
15,720 m^3	
Time Span	
Weekly	45 weeks
Monthly	10.3 months
Daily	225 days (5-day work weeks)

Average Airspace Consumed	
Weekly	349 m^3 per week
Monthly	1,526 m^3 per month
Daily	69 m^3 per day

The airspace at the West 40 landfill was monitored over a 45-week period in 2020 – this equated to 10.3 months, or 225 days of observations. During this period, it was confirmed via survey that 15,720 m³ of airspace was consumed. Similarly, this translates to approximately 1,526 m³/ month of airspace consumed. Applying this over a 12-month period, the City estimates that approximately 18,312 m³ of airspace was consumed in 2020 at the West 40 Landfill. Further details can be found in Appendix C.

F. A summary report which includes all data and information generated under the Monitoring Program, including the QA/QC program, in electronic and printed formats acceptable to the Board.

In 2020, the City continued testing procedures as described in the City's Type A water licence 3AM-IQA1626, and Environmental Monitoring Program and Quality Assurance/ Quality Control Plan. Table 5 lists all samples that were taken in 2020. The complete monitoring results are provided in Appendix A.

Table 5 Summary of 2020 Sampling Conducted

Date	Test	Sample Name	No. Samples	Lab Sample ID
16-Jan-2020	F	WWTP Influent	1	B20-01628
16-Jan-2020	F	WWTP Effluent	1	B20-01628
16-Jan-2020	A	WTP Raw	1	B20-01629
16-Jan-2020	A	WTP Raw (Total)	1	B20-01629
16-Jan-2020	A	WTP Potable	1	B20-01629
16-Jan-2020	A	WTP Potable (Total)	1	B20-01629
21-Jan-2020	A	WTP Raw	1	B20-02424
21-Jan-2020	A	WTP Raw (Total)	1	B20-02424
21-Jan-2020	A	WTP Potable	1	B20-02424
21-Jan-2020	A	WTP Potable (Total)	1	B20-02424
29-Apr-2020	A	WTP Raw	1	B20-11345
29-Apr-2020	A	WTP Raw (Total)	1	B20-11345
29-Apr-2020	A	WTP Potable	1	B20-11345
29-Apr-2020	A	WTP Potable (Total)	1	B20-11345
29-Apr-2020	F	WWTP Influent	1	B20-11348
29-Apr-2020	F	WWTP Effluent	1	B20-11348

Date	Test	Sample Name	No. Samples	Lab Sample ID
26-May-2020	A	WTP Raw	1	B20-14378
26-May-2020	A	WTP Raw (Total)	1	B20-14378
26-May-2020	A	WTP Potable	1	B20-14378
26-May-2020	A	WTP Potable (Total)	1	B20-14378
26-May-2020	F	WWTP Influent	1	B20-14382
26-May-2020	F	WWTP Effluent	1	B20-14382
25-Jun-2020	A	WTP Raw	1	B20-17803
25-Jun-2020	F	WWTP Influent	1	B20-17801
25-Jun-2020	F	WWTP Effluent	1	B20-17801
25-Jun-2020	A	WTP Raw	1	B20-17803
25-Jun-2020	A	WTP Raw (Total)	1	B20-17803
25-Jun-2020	A	WTP Potable	1	B20-17803
25-Jun-2020	A	WTP Potable (Total)	1	B20-17803
28-Jul-2020	D	WWTP Boiler Room	1	B20-21851
28-Jul-2020	E	Holding Pond Area	1	B20-21852
31-Jul-2020	E	Detention Pond 1QA08B	2	B20-22357
12-Aug-2020	A	WTP Raw	1	B20-22490
12-Aug-2020	A	WTP Raw (Total)	1	B20-22490
12-Aug-2020	A	WTP Potable	1	B20-22490
12-Aug-2020	A	WTP Potable (Total)	1	B20-22490
18-Aug-2020	E	Lagoon (Start of Decant)	1	B20-24783
23-Aug-2020	E	Lagoon (Middle of Decant)	1	B20-26042
10-Sep-2020	A	WTP Raw	1	B20-28009
10-Sep-2020	A	WTP Raw (Total)	1	B20-28009
10-Sep-2020	A	WTP Potable	1	B20-28009
10-Sep-2020	A	WTP Potable (Total)	1	B20-28009
16-Sep-2020	E	Lagoon (Start of Decant)	1	B20-28907
19-Sep-2020	E	Lagoon (Middle of Decant)	1	B20-29680
23-Sep-2020	E	Lagoon (End of Decant)	1	B20-29682
7-Oct-2020	F	WWTP Influent	1	B20-32254
7-Oct-2020	F	WWTP Effluent	1	B20-32254
14-Oct-2020	F	Lagoon (Start of Decant)	1	B20-32773

Date	Test	Sample Name	No. Samples	Lab Sample ID
19-Oct-2020	F	Lagoon (Middle of Decant)	1	B20-34331
23-Oct-2020	F	Lagoon (End of Decant)	1	B20-35231
19-Oct-2020	A	WTP Raw	1	B20-35233
19-Oct-2020	A	WTP Raw (Total)	1	B20-35233
19-Oct-2020	A	WTP Potable	1	B20-35233
19-Oct-2020	A	WTP Potable (Total)	1	B20-35233
23-Nov-2020	A	WTP Raw	1	B20-37370
23-Nov-2020	A	WTP Raw (Total)	1	B20-37370
23-Nov-2020	A	WTP Potable	1	B20-37370
23-Nov-2020	A	WTP Potable (Total)	1	B20-37370
23-Nov-2020	F	WWTP Influent	1	B20-37372
23-Nov-2020	F	WWTP Effluent	1	B20-37372
23-Oct-2019	A	WTP	4	B19-34273
23-Oct-2019	F	WWTP, Effluent	1	B19-34282
23-Oct-2019	F	WWTP, Influent	1	B19-34282
27-Nov-2019	A	WTP	4	B19-38495
24-Nov-2019	F	WWTP, Effluent	1	B19-38496
24-Nov-2019	F	WWTP, Influent	1	B19-38496

G. A summary of all construction activities carried out for the facilities.

There were no construction activities conducted with respect to the water licence in 2019.

H. A summary of any modifications and/or major maintenance work carried out at the facilities and any associated structures.

Wastewater Treatment Plant

The primary treatment system remains in operation following commissioning of that system in 2019. Construction of the secondary treatment system was completed – less deficiencies – on March 7, 2020, with initial commissioning commencing at that time. With the COVID-19 pandemic escalating across Canada shortly after, the Contractor responsible for the work made the decision to demobilize staff from Iqaluit on March 18, 2020 before commissioning activities were fully completed.

Status through most of 2020 – and current status – is that the primary treatment process continues to function, with partial secondary treatment through the Moving Bed Biofilm Reactor (MBBR) tanks and flow-through the new Dissolved Air Flotation (DAF) tanks.

Following negotiations with the Contractor and Prime Consultant, the Contractor's staff have now remobilized back to site on February 1, 2021 to complete commissioning of the secondary treatment system. Completion of commissioning for the secondary treatment system is anticipated by the end of March 2021.

The scope of work for the WWTP Upgrade also includes replacement of the emergency diesel generator, which has reached its end of life. A design to replace this existing generator for the plant was completed by the Prime Consultant. The City intends to procure and install the new permanent emergency generator by Fall 2021.

I. A progress report and revisions (if applicable) to any studies requested by the Board that relate to waste management, water use, or reclamation and a brief description of any future studies planned by the Licensee including, a non-technical executive summary for the general public, translated into Inuktitut.

Drinking Water Management Plan

A final report was prepared and submitted by City consultant Exp for the Drinking Water Management Plan project in April 2020. The City will be reviewing and strategizing an action plan for the implementation of recommendations provided in the report. A copy of the report has been provided in Appendix C.

Long-Term Water Project – Long-Term Storage Pre-Feasibility Study

In November 2019, the City retained Exp to investigate viable alternatives for secondary water storage, in addition to the Lake Geraldine Reservoir. The intent is to investigate three (3) alternatives, which will meet future City demand requirements, given the projected growth of the municipality and water demand requirements. A recommended option was provided in October 2020 and presented to City of Iqaluit Council for endorsement in November 2020 – Council endorsed the recommended option. The final report was submitted to the City in December 2020. A copy of the report has been provided in Appendix C.

The City will be initiating a Preliminary Engineering Design Study in 2021, which will further assess technical requirements for the recommended option.

Long-Term Water Project – Unnamed Lake Water Withdrawal and Flow Analysis for Long-Term Supplementation

The City engaged Golder Associates in August 2020 to conduct a water balance assessment of Unnamed Lake, in order to confirm the long-term viability of Unnamed Lake as a supplemental water supply source to Lake Geraldine. The assignment intends to quantify expected range of catchment surplus and reservoir supply deficits under a 'do nothing' scenario, based on existing and expected snowfall accumulation and expected summer rainfall yield at the time of 2020 freeze-up, which is anticipated in November. The assignment will be completed in March 2021.

The assignment will serve as a stepping stone for the initiation of a Preliminary Engineering Design Study, which will investigate the technical requirements for required infrastructure to pump water from Unnamed Lake to Lake Geraldine for resupply purposes. The Study will also further establish technical requirements for

the recommended option presented in the Long-Term Water Storage Pre-Feasibility Study.

Long-Term Water Project – Unnamed Lake Fish & Fish Habitat Assessment

The City engaged WSP in August 2020 to conduct a fish and fish habitat assessment of Unnamed Lake, in order to qualify the presence of fish within the reservoir, and the impacts of potential future water withdrawal may have on resident fish population. Should a resident fish population be identified, the assignment will provide recommendations for compliance with Federal legislation administer by the Department of Fisheries and Oceans Canada (DFO). The assignment will be completed in March 2021.

Recommendations provided in the assignment will be initiated in a Preliminary Engineering Design Study for the Long-Term Water Project in 2021.

J. Any revisions required, in the form of addenda, to Plans, Manuals and Reports approved under the Licence.

The following Plans, Manuals, and Reports approved under the Licence, were completed in 2020:

- Sewage Lagoon Operations and Maintenance Manual
- Wastewater Treatment Plant Operations and Maintenance Manual

The City will be issuing the documents to the NWB for record purposes.

K. A list and description, including volumes and Spill Report Line Identification Numbers, of all un-authorized discharges, spills and summaries of follow-up action taken.

Table 6 below provides a summary of all reported spills/ un-authorized discharges that occurred in 2020. Details of the spill have been provided in Appendix B

Table 6 Summary of spills/ un-authorized discharges in 2020

Spill ID	Date	Location	Type	Volume	Cause	Follow-Up Action
2020096	April 6, 2020	House 281	Sewage	Unknown	Partial Blockage	Road crew cleaned up
2020099	April 6, 2020	AV5	Sewage	Unknown	Blockage	Road crew cleaned up
2020155	April 30, 2020	AV5	Sewage	Unknown	Pipe Break	Road crew cleaned up
2020218	July 6, 2020	Lift Station 1	Sewage	Unknown	Overflow Event	Road crew cleaned up
2020388	September 22, 2020	AV244 to WWTP	Sewage	5 m^3	Pipe Break	Was Nunavut excavating Job for the city
2020096	April 6, 2020	House 281	Sewage	Unknown	Partial Blockage	Road crew cleaned up

L. A summary of any closure and reclamation work undertaken and an outline of any work anticipated for the next year, including any changes to implementation and scheduling.

No closure and reclamation work was undertaken in 2020.

M. A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector.

No inspections or compliance reports were filed requiring actions to address concerns or deficiencies in 2020.

N. A brief update on the implementation plan of all facilities within the scope of this Licence including projected implementation and status of the Upgraded Wastewater Treatment Plant.

Wastewater Treatment Plant

The primary treatment system remains in operation following commissioning of that system in 2019. Construction of the secondary treatment system was completed, less deficiencies, March 7, 2020 and initial commissioning commenced at that time. With the COVID-19 pandemic escalating across Canada shortly after, the Contractor responsible for the work made the decision to demobilize staff from Iqaluit on March 18, 2020 before commissioning activities were fully completed.

Status through most of 2020 and current status is Primary Treatment continues to function, with partial secondary treatment through Moving Bed Biofilm Reactor (MBBR) tanks and flow-through the new Dissolved Air Flotation (DAF) tanks.

Following negotiations with the Contractor and Consultant, the Contractor's staff have now remobilized back to site to complete the secondary treatment system commissioning work as of February 1, 2021. Commissioning completion of the secondary treatment system is anticipated by the end of March 2021.

The scope of work for the WWTP Upgrade includes replacement of the emergency diesel generator that has reached its end of life. A design to replace this existing generator for the plant was completed by the incumbent Consultant on February 8, 2021. The City intends to procure and install the new permanent emergency generator during Fall 2021.

Landfill and Waste Transfer Station

The detailed design of the landfill and waste transfer station began in 2019. The 100% design package for both components of the project was completed in 2020 and submitted to the Nunavut Water Board for review, as part of an application to amend the City's Type A water licence. The review process is currently ongoing. Once the review is complete and comments are received, the design will be updated accordingly.

Construction of the new landfill and waste transfer station is planned to begin during the summer of 2021. Construction of the new landfill is planned to be completed by Q4-2022. Similarly, construction of the waste transfer station is planned to be completed by Q3-2023.

O. A summary of any studies, reports and plans requested by the Board that related to waste disposal, water use, or reclamation and a brief description of any future studies planned.

Long-Term Water Project – Preliminary Engineering Design Study

The goal of the Long-Term Water Project is to ensure that a new supplemental water supply source and storage alternative to Lake Geraldine is identified and

implemented for use by 2026, when the City's current water licence expires. The Long-Term Water Project will ensure that the City will be able to meet water demand requirements for the short- and long-term periods, given the projected increase in water demand due to population growth and increase in economic development in the community.

For the supply component to the Long-Term Water Project, the City had previously conducted studies on the long-term viability of other nearby water sources (Apex River and Sylvia Grinnell River). Studies were commenced on Unnamed Lake with a Water Balance modelling study and a fish / fish habitat study. These studies are expected to be completed by March 2021. If it is confirmed that Unnamed Lake presents a viable long-term solution for supporting the supplementation of fresh water to Lake Geraldine, it will be assessed together with the other supply options that have been reviewed from a technical, financial, environmental, and constructability standpoint, in order to determine which is the best long-term solution for the City.

For storage component to the Long-Term Water Project, the City previously conducted studies on the long-term viability of expanding Lake Geraldine as a storage reservoir. In 2020, a pre-feasibility study identified an additional bermed and excavated reservoir adjacent to Lake Geraldine, as a preferred additional storage option. The option was presented to City of Iqaluit for endorsement and accepted as the alternative to pursue.

The City will be engaging a consultant in 2021 to conduct the next phase of the project – a Preliminary Engineering Design Study, which will assess the technical, constructability, environmental, financial, and legal/ permitting requirements for Unnamed Lake as a secondary supplementary supply source to Lake Geraldine, and an additional bermed and excavated reservoir adjacent to Lake Geraldine for additional storage capacity. The Study will consider the following:

- Recommendations presented in the Unnamed Lake Water Balance Assessment
- Recommendations presented in the Unnamed Lake Fish & Fish Habitat Assessment
- Recommendations presented in the Long-Term Storage Pre-Feasibility Study
- Due Diligence activities to quantify the feasibility of the recommendations provided for the expansion of Lake Geraldine (as per Long-Term Storage Pre-Feasibility Study and Unnamed Lake Water Balance Assessment). This includes:
    - Topographic surveys
    - Geotechnical investigations
    - Archeological assessments
    - Supplementary environmental investigations to facilitate future permitting requirements

The City is planning to start the study in June 2021 and anticipates completion by Q2-2022.

P. Any other details on the use of water or waste disposal requested by the Board by November 1st of the year being reported.

There are no additional details to be shared.

APPENDIX A
MONITORING REPORTS

APPENDIX B
SPILL REPORTS

APPENDIX C
OTHER REPORTS

- Dam Safety Inspection Report – Concentric, December 2020
- Dam Safety Management Plan – Meco Engineers, July 2020
  Includes: *Dam Safety Management Plan*
  Lake Geraldine Operations, Maintenance & Surveillance Manual
  Emergency Response Plan for Dam Safety
  Technial Analysis & Risk Assessment
- Drinking Water Management Program – Exp Services, June 2020
- Iqaluit Water Storage Pre-Feasbility Study – Exp Services, October 2020
- Waste Generation and West 40 Landfill Airspace Projections – AECOM, September 2020