

**City of Iqaluit**  
**2015 Annual Water License Report**  
**Executive Summary**

Under Water License 3AM-IQA0611 (the License), 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 License was issued by the Nunavut Water Board (NWB) in 2006 and expired on July 15, 2012. On October 2, 2012, the City submitted its Application for Water License Renewal. In compliance with requirements of Schedule B of the License, this Annual Water License Report summarizes the activities conducted by the City in 2015.

Monthly Monitoring Program

On December 5, 2014, Indigenous and Northern Affairs Canada (INAC) provided the City of Iqaluit with a letter discontinuing the requirement to sample and provide results as part of the monitoring program for stations IQA-01, IQA-03 and IQA-05 and modified the frequency of testing for IQA-04 and IQA-06. The City implemented these new conditions for the 2015 Monitoring Program.

Water Supply

In 2015, the City used 1,088,690 m<sup>3</sup> of water from the Lake Geraldine, which is below the quantity of water not to be exceeded under the License (1,100,000 m<sup>3</sup>).

In September 2015, a Dam Safety Inspection (DSI) was completed for the Lake Geraldine Dam.

City Council approved the Supplementary Water Supply Plan in 2015 to extract water from Apex River. The City will submit an amendment to the new Water Licence to incorporate the Apex River as an additional Municipal water source.

Wastewater Treatment

The City completed the Wastewater Treatment Plant Upgrade/Expansion Feasibility Study. Detailed Design is expected to be completed in 2016.

Solid Waste Management

The City continues to manage its solid waste at the West 40 Landfill, which is nearing capacity. Landfill runoff continues to be managed through on-site detention ponds and an off-site retention pond.

The Landfill run-off originating from the Landfill fire in 2014 started treatment in 2015. The on-site pond has completed the first phase of treatment and transferred to the new off-site pond for secondary treatment. In 2016, it is expected that all run-off originating from the Landfill fire will be treated, tested and discharged into Koojesse Inlet.



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Water License No. 3AM-IQA0611  
**2015 Annual Report**  
City of Iqaluit

In July of 2006, the City of Iqaluit (City) was issued Water License number 3AM-IQA0611 (the License) by the Nunavut Water Board. This license was issued for a five-year period commencing on May 15, 2006. On June 17, 2011, the Nunavut Water Board amended the License expiry date to July 15, 2012. On October 2, 2012, the City submitted its Application for Water License Renewal. A requirement of the License is an annual report due March 31 of each year summarizing activities governed by the License for the previous calendar year. In accordance with Schedule B of the Water License, this Annual Water License Report summarizes the activities conducted by the City of Iqaluit in 2015.

**A. The monthly and annual quantities in cubic meters of water obtained from Lake Geraldine**

Table 1 summarizes the monthly and annual quantities of water drawn from Lake Geraldine, the City of Iqaluit's raw water source. The total water usage for 2015 was 1,088,690m<sup>3</sup>, which is below the maximum allowable usage of 1,100,000m<sup>3</sup>.

**Table 1. Raw Water Drawn  
from Lake Geraldine Reservoir (2015)**

<b>Month</b>	<b>Volume (m<sup>3</sup>)</b>
January	90,450
February	84,790
March	99,880
April	92,300
May	92,570
June	88,300
July	90,700
August	90,500
September	91,400
October	92,000
November	83,500
December	92,300
<b>Total</b>	<b>1,088,690</b>

**B. The monthly and annual quantities in cubic meters of discharge from the Wastewater Treatment Facility**

Table 2 summarizes the monthly and annual quantities of discharge from the City of Iqaluit's Wastewater Treatment Plant (WWTP) during 2015.

**Table 2. Discharge from the Wastewater Treatment Plant (2015)**

<b>Month</b>	<b>Total</b>
January	84,009
February	74,358
March	87,315
April	41,691
May	3,302
June	81,686
July	87,976
August	83,171
September	79,899
October	83,924
November	77,133
December	82,704
<b>Total</b>	<b>867,167</b>

During periods when the WWTP was shut down for maintenance, raw sewage was diverted to the backup sewage lagoon. The knife gate valve that diverts the sewage to the sewage lagoon is not equipped with a monitoring device; therefore, there were no measurements taken to determine the amount of discharge for the days that the WWTP was not operational. As a result, the amount of discharge for the duration of each shutdown was calculated using average daily discharge rates. The average daily total was determined by dividing the total volume of discharge from the WWTP recorded for the month that the shutdown occurred by the number of days the WWTP was operational that month. The dates of each shutdown can be found in Section F.

In April and May of 2015, major repairs were required on the Salsnes Filter. This resulted in the City diverting sewage to the sewage lagoon for 44 days while the City waited for parts to arrive from Germany.

**C. The monthly and annual quantities in cubic meters of sludge removed from the Wastewater Treatment Facility**

Table 3 summarizes the estimated monthly and annual quantities of sewage sludge removed from the City of Iqaluit's WWTP and deposited at a designated area in the West 40 Landfill.

**Table 3. Sewage Sludge Removed from the Wastewater Treatment Facility and Deposited at the West 40 Landfill (2015)**

<b>Month</b>	<b>Total</b>
January	47.6
February	44.2
March	54.4
April	23.8
May	3.4
June	51.0
July	54.4
August	51.0
September	47.6
October	51.0
November	51.0
December	54.4
<b>Total</b>	<b>533.8</b>

The sludge that is removed by the Salsnes Filter in the WWTP falls into a trailer in a room below the primary treatment room. The trailer that is used to catch the sludge from the Salsnes Filter has 3.4 cubic meters of storage and is approximately 100% full each time it is unloaded. The trailer is unloaded at the West 40 Landfill every second day including weekends and holidays. The difference in volume from month to month is due to two different factors: 1) every month doesn't have the same number of days, and 2) during the shutdowns there is no sludge produced because the raw sewage was diverted to the lagoon.

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

In 2015, the City implemented a new Monitoring Program based on the letter received from Indigenous and Northern Affairs Canada (formerly Aboriginal Affairs and Northern Development Canada), please see Appendix A for the letter.

Station IQA-01 (Raw Water Supply) was removed from the Monitoring Program as this is already sampled and monitored by the City of Iqaluit and the Government of Nunavut, Environmental Health, in relation to safe drinking water standards set out in the Public Water Supply Regulations. The City is still continuing to monitor the water quality on its own accord and have the provided results with this report.

Stations IQA-03 (Influent Sewage Lagoon) and IQA-05 (Influent Wastewater Treatment Plant) have also been removed from the Monitoring Program. These stations only provide information on raw, untreated effluent. The City is still continuing to monitor the wastewater quality on its own accord and have the provided results with this report.

The frequency of testing for Station IQA-06 (Sludge at Wastewater Treatment Plant) has changed from open water months to quarterly. This change provides a better representation of the sludge.

Changes were made to test parameters and testing frequency for Station IQA-04 (Effluent Wastewater Treatment Plant). The testing requirement for Chlorinated Paraffins was removed as the City could not find a lab to complete the testing and LC50 Bioassay (R Trout) was removed as it was understood that the level of treatment from the Wastewater Treatment Plant would not provide a quality effluent to pass the test. The quarterly sampling group was the only group required to sample as it covered all testing parameters except Chlorinated Paraffins and LC50 Bioassay (R-Trout)

The City completed the 2015 Monitoring Program based on the requirements outlined in schedule C of the Water License. Sample bottles were ordered from an accredited laboratory in Ottawa and shipped to Iqaluit. Samples were taken by City staff and sent back to the laboratory the same day. Please see Appendix 'B' for a summary of the samples taken and a copy of all of the sample reports provided by the laboratory. Quarterly Monitoring Reports were completed for each period for which samples were taken as well as an Annual Monitoring Report that summarizes the Monthly Monitoring Reports. Please see Appendix B for the Monthly Monitoring Reports and the Annual Monitoring Report.

**E. A summary of construction activities conducted**

There were no construction activities conducted with respect to the water licence in 2015.

**F. A summary of any modification and/or major maintenance work and/or demolition work carried out and any associated structures**Wastewater Treatment Plant

The following maintenance work was carried out at the WWTP in 2015:

January 12-15, 2015	Filter in the Salsnes Filter was replaced.
February 18, 2015:	Filter in the Salsnes Filter was replaced.
April 16 - May 29, 2015:	Bearings on the Salsnes Filter siezed.
September 17-19, 2015:	The filter in the Salsnes Filter was replaced.

During the above listed maintenance work, the WWTP was shut down and the sewage was diverted to the sewage lagoon.

West 40 Landfill

In 2015, the Qikitaaluk Environmental removed hazardous waste from the West 40 Landfill. Please see Appendix C for the Certificate of Disposal, Storage and Transfer of all hazardous waste removed from the West 40 Landfill.



**G. A summary of all work carried out under the Managements Plans in accordance with this License**

Lake Geraldine Dam Safety Inspection

In September 2015, a Dam Safety Inspection (DSI) was performed on Lake Geraldine Dam. The DSI report can be found in Appendix D.

Sewage Lagoon Dam Safety Inspection

In September 2015, a Dam Safety Inspection (DSI) was performed on the Sewage Lagoon. The DSI report can be found in Appendix E.

**H. A progress report and revisions 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, an executive summary in terms understandable to the general public, translated into Inuktitut**

Supplementary Water Supply Plan

The City's 2010 General Plan identifies Apex River as a potential supplementary water source for the City. In 2013, the City undertook the development of a Supplementary Water Supply Plan and Preliminary Design. This work includes a feasibility study to confirm that Apex River is a suitable source. The Supplementary Water Supply Plan was completed in 2014 and was approved by City Council 2015. A copy of the Supplementary Water Supply Plan was included in the 2014 Water Licence Annual Report.

**I. Any addenda to the approved Contingency Plans and the approved Operation and Maintenance Manuals**

There are no addenda to approved Contingency Plans and the approved Operation and Maintenance Manuals.

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

Table 4 provides a summary of all spills and un-authorized discharges that occurred in 2015, including volumes, Spill Report Line Identification Number and summaries of the follow-up actions taken. Copies of the spill reports and a map showing all spill locations can be found in Appendix F.

Table 4: Spill Reports

Spill Report ID Number	Date (m/d/y)	Location	Description	Volume (m <sup>3</sup> )	Cause	Follow up Actions
2015018	01/20/2015	Sewage Truck Dump Station	Sewage	Unknown	Wastewater Treatment Plant Pump Failure	Sewage flow was diverted to the Sewage Lagoon, Utilidor Staff repaired the pump that failed and re-diverted the sewage to the Wastewater Treatment Plant. The Department of Public Works cleaned up the contaminated snow and ice and disposed of the snow and ice in the Sewage Lagoon.
2015052	02/06/2015	Water Treatment Plant	Fuel Oil No. 2	Unknown	Float Switch Stuck on Open in Day Tank	The automated fuel system was run manually until the automated system was fix. The contaminated snow and ice was cleaned up by the Department of Public Works and disposed of at Nunatta Environmental Landfarm. The City of Iqaluit completed tests on the affected soil and excavated the full extent of the contaminated soil and disposed of the soil at Nunatta Environmental.
2015168	04/22/2015	Sewage Lagoon	Sewage	13 L	Lagoon Decant, Reaching Capacity	Lagoon Decant
2015314	07/20/2015	AV 202 Nunavut Drive	Sewage	100 L	Sewer Main Clogged with Rags	Sewage Trucks pumped down the access vault to prevent any further spill, the sewer main was blasted with water to clear the blockage. The Department of Public Works cleaned up the contaminated soil and disposed of it at the Sewage Lagoon.
2015396	09/21/2015	Sewage Truck Dump Station	Sewage	45,830 L	Power Outage, Generator Transfer Switch at Wastewater Treatment Plant Failure	The sewage flow was diverted to the lagoon until the power was restored to the Wastewater Treatment Plant. It was determined that the generator failed during the power outage and was repaired immediately following the power outage.
2015481	11/26/2015	Lift Station #1	Sewage	Unknown	PLC Failure in Lift Station No. 1	Failure of the PLC at the Lift Stations did not activate the automated switch of the wet well pumps. When it was noticed that sewage was coming out the overflow the pumps were started manually to prevent any further spill. The PLC was fixed to ensure the Lift Station was working properly. The Department of Public Works cleaned up the contaminated snow and ice and disposed of it at the Sewage Lagoon.
2015510	12/23/2015	Queen Elizabeth Way between Manhole 8 and PTA2	Sewage	750,000	Damaged Manhole	A damaged manhole caused a back up of sewage in a trench. The spill was confined to the trench, pumped into the nearby sewers and sewer trucks also pumped from the trench and dumped at the sewer truck dump station.

**K. Any revisions to approved Closure and Reclamation Plans**

In 2015, no revisions were made to approved Closure and Reclamation Plans.

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

In 2015, no closure and reclamation work was undertaken. No closure or reclamation work is anticipated for 2016.

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

The City, Indigenous and Northern Affairs of Canada and Environment (INAC) and Climate Change Canada (ECCC), meet on a quarterly basis to discuss the Inspector's Directions that were issued in 2013. See Appendix G for the four quarterly reports that were submitted to INAC and ECCC for each quarterly meeting.

**N. Update on implementation of recommendations from any Dam Safety Inspection and/or Review****Lake Geraldine Dam Safety Inspection**

See below the recommendations that were made in the 2015 Lake Geraldine Dam Safety Inspection (DSI), the City will review the recommendations in 2016 and determine an implementation program for the recommendations:

- The addition of a remote surveillance camera is recommended.
- Update the Permanent Record File, Logbook and Operation and Surveillance Manual.
- Review the Emergency Preparedness Plan and add to the Permanent Record File.
- Dam Safety Inspection (DSI) is required in 2016.
- Dam Safety Review (DSR) is required in 2018.
- Consideration should be given to implementing a pore-water pressure monitoring program leading up to the DSR in 2018, to assist with seepage and deformation assessments.
- It is recommended that a Seismic Hazard Assessment be conducted prior to the next DSR.
- Maintenance and repairs to the north access road.
- Additional ballast/rip-rap is recommended at the
  - South end of the central berm
  - East elevation of the central berm
  - Within the downstream drainage at the base of the spillway.
- Exercising and testing the valves within the valve chamber.
- Install new signage at the two access roads and around the dam.
- Complete the repairs noted in the 2014 DSI.

**Sewage Lagoon Dam Safety Inspection**

See below the recommendations that were made in the 2015 Sewage Lagoon Dam Safety Inspection (DSI) and the City will review the recommendations in 2016 and determine an implementation program for the recommendations:

- Update the Operation and Safety Manual, Logbook and Permanent Record File.
- Capacity of the Lagoon should be confirmed.
- Dam Safety Inspection is required in 2017.
- The purpose of three small galvanized, corrugated steel pipes observed within the embankment on the north elevation of the lagoon should be confirmed.
- New signage should be installed around the Sewage Lagoon and at the access points.
- Areas of minor erosion should be repaired in the spring of 2016.

**O. A brief update on the implementation plan of all facilities within the scope of this License including projected implementation and status of Phase II of the Wastewater Treatment Plant**

Phase 2 Wastewater Treatment Plant Upgrade

The City completed the Wastewater Treatment Plant Upgrade/Expansion Feasibility Study in 2015. Please see Appendix H for the Feasibility Study. The City will be issuing an RFP for detailed design in 2016 and it is expected the design will be completed in 2016.

**P. Any details on water use or waste disposal requested by the Board by November 1<sup>st</sup> of the year being reported**

There were no requests made by the Board after November 1, 2015.

## **Appendices**

Appendix A – INAC Confirmation Letter Changing Monitoring Program and Reporting

Appendix B – Quarterly and Annual Monitoring Reports

Appendix C –Hazardous Materials Transportation Documentation

Appendix D – Lake Geraldine Dam Safety Inspection

Appendix E – Sewage Lagoon Dam Safety Inspection

Appendix F – Spill Reports

Appendix G – INAC, ECCC Quarterly Reports

Appendix H – Iqaluit WWTP Upgrade-Expansion Feasibility Study