CITY OF IQALUIT

WATER LICENCE 3AM-IQA1626

# 2021 – 2023 Annual Report Review Responses

May 02, 2025

# A. CIRNAC COMMENTS ON THE 2021 ANNUAL REPORT

## 1. Quantify and report the volume of spills or unauthorized discharges in the future

Comment on the City of Iqaluit's Response:

The City continues to not provide information on the volume of spills. The City's response provided in the 2023 Annual Report that spill volumes typically do not exceed 100 litres raises concerns. If precise quantification is challenging, it is unclear how the city can guarantee that spill volumes are less than 100 litres. Additionally, while the Spill Line has a limit of 100 L as their reporting threshold, that is not the same for the water license where all uncontrolled releases of waste that may affect water are required to be reported. This is a requirement of the water license and failure to comply brings the proponent into non-compliance. The City is strongly encouraged to address this issue.

*City of Iqaluit's Response:*

*The comment is acknowledged. Moving forward, the City will quantify the volume of spills to the best of our ability based on the information available.*

*Additionally, the City will report all spills, irrespective of their volume, as it has been doing since 2021.*

# B. CIRNAC COMMENTS ON THE 2022 ANNUAL REPORT

## 3. Sampling for the monitoring and QA/QC program

Recommendation:

(R-03b) CIRNAC recommended the City of Iqaluit update the 2022 Annual Report with the sample results from S::CAN monitoring device located at the water treatment plant in the 2022 Annual Report.

(R-03e) CIRNAC recommended the City of Iqaluit review and update operating procedures for pH control in the treated water entering the treated water reservoir to meet CDWQG.

Comment on the City of Iqaluit's Response:

(R-03b) The requested information was not provided in the updated 2022 Annual Report or 2023 Annual Report. Comment makes reference that data from S::CAN is similar to grab samples collected by plant operators, but readings for hydrocarbons do not appear to be included in the daily log sheets for the WTP. The City of Iqaluit made comment about limited storage capacity for S::CAN system, but there is reference in the Water Treatment Plant Report (Appendix C of 2023 Annual Report) that the data is stored and they have capability to review

present and historical data. A plot of the S::CAN data should be provided annually in the Annual Reports if there are issues with data storage.

(R-03e) In 2015 the Canadian Drinking Water Quality Guideline (CDWQG) for pH was updated to be 7-10.5 for treated water. Monthly third-party laboratory results included in the 2022 and 2023 Annual Reports along with the 2023 WTP log sheets included in appendix F of the 2023 Annual Report regularly have pH readings on finished water below the CDWQG guideline. Review of the WTP O&M manuals indicated that a caustic soda system is included at the WTP for treated water pH control, however an updated operating procedures for pH control in the treated water entering the treated water reservoir to meet CDWQG is not included.

*City of Iqaluit's Response:*

*(R-03b) Unfortunately, S::CAN data is only stored for a limited timeframe and as a result the City does not have the S::CAN data from previous years. We are working with an engineering consultant, WSP and the S::CAN provider to ensure we can provide for the S::CAN data required moving forward.*

*(R-03e) We have provided the updated operating procedures for the Water Treatment Plant in appendix A. The City is consistently working to ensure that our water quality meets CDWQG.*

**5. Updated plans, manuals, and reports in 2022**

Recommendation:

(R-05) CIRNAC recommended the City of Iqaluit update the 2022 Annual Report and corresponding documents to address Schedule B item "j" of the Water Licence. The plans, manuals, and reports to be addressed include, but are not limited to, the following:

a) March, May, and June 2022 revisions to the General Site Information and Guide for the Iqaluit Water Treatment Plant,
b) March 2022 Iqaluit Water Treatment Plant Operation and Maintenance Manual,
c) City of Iqaluit Operations and Maintenance Manual Landfill and Waste Transfer Station (Aug 2022 Version 6.0),
d) Updates to WWTP Operations and Maintenance Manual following substantial completion/commissioning, and
e) Updates to the Iqaluit Water Treatment Plant Operation and Maintenance Manual to reflect the modifications of the filters to GAC media.

Comment on the City of Iqaluit's Response:

The updated 2022 Annual report, section J makes reference to updates that were completed to the respected O&M manuals. The text in the report does not include references to the wastewater treatment plant that had final completion in 2022 nor

modifications to the process of the water treatment plant so it is unclear what was updated in these manuals.

The versions of the Iqaluit Water Treatment Plant Operation and Maintenance Manuals provided for review do not reflect the modifications of the filters to GAC media (it is listed as pending and has details on the old filter media throughout).

*City of Iqaluit's Response:*

a) *The May and June 2022 revisions to the General Site Information and Guide for the Iqaluit Water Treatment Plant are provided in the Appendix. However, there were no changes to the General Site Information and Guide in March. There were only updates to the Operation & Maintenance Manual in 2022.*
b) *The March 2022 Iqaluit Water Treatment Plant Process, Mechanical and Electrical Operation and Maintenance Manual are provided in the Appendix.*
c) *The Landfill and Waste Transfer Station are not yet commissioned. Once there are commissioned the City will provide the Operations and Maintenance Manuals for both facilities.*
d) *The City is awaiting a response from WSP and will provide this document once a response is received.*
e) *The latest version of the Operation and Maintenance Manual reflects the modifications to the GAC media at the time of the O&M publication. The January 2024 Operation and Maintenance Manual is provided the Appendix.*

**6. Un-authorized discharges and spills**

*Recommendation:*

(R-06b) CIRNAC recommended the City of Iqaluit specify the most common causes of spills and unauthorized discharges in the 2022 Annual Report and submit an updated Spill Contingency Plan that addresses these causes.

Comment on the City of Iqaluit's Response:

The city's response adequately specifies the most common causes of spills, as requested. However, it does not address the submission of an updated Spill Contingency Plan that incorporates these causes, leaving this aspect of the recommendation unmet. Additionally, the city's assurance that spill volumes typically do not exceed 100 litres raises concerns. If precise quantification is challenging, it is unclear how the city can guarantee that spill volumes are less than 100 litres. Therefore, the response is partially adequate but lacks comprehensive action and assurance regarding spill volumes.

*City of Iqaluit's Response:*

*The causes of spills have evolved over the years. Initially, the City experienced spills due to failing infrastructure. In 2021, the City recorded approximately 10 spills. Since then, the City has addressed these issues, leading to a reduction in spills recorded year-round. The City has recorded 4 spills since January 2024, primarily due to blockages in the sewer system caused by trash, clothing, or random waste.*

*The most common cause of spills experienced by the City of Iqaluit is caused by sewage back ups. These backups can be caused by pipe failure, foreign objects in the wastewater collection system and grease or sludge accumulation to name a few. City Public Works work to repair damaged lines as soon as the need for repair is identified. In addition, the City is planning to incorporate an annual sewer cleaning and CCTV inspection program to identify potential problem areas and address them prior to experiencing back ups. The City will also develop a public Information program to remind residents of what can and cannot go into the wastewater collection system.*

*The City has recently drafted a spill response plan that will be updated as required.*

**8. Withdrawals from Niaqunguk (Apex) River**

Recommendation:

(R-08a) CIRNAC recommended the City of Iqaluit update the 2022 Annual Report with the daily water levels and/or flow rates in the Niaqunguk River when withdrawals occurred at Monitoring Station IQA-10 for Period 1 (between June 12 and September 12, 2022).

Comment on the City of Iqaluit's Response:

(R-08a) Daily Water Levels and Flow Rates the City of Iqaluit did not provide the updated report that includes the daily water levels and flow rates from June 1 to September 12, 2022.

*City of Iqaluit's Response:*

*The daily flow rates from June 6 to September 12, 2022, are provided in the Appendix.*

**8. Supplementary Lake Geraldine Water Balance Modelling for 2022**

Recommendation:

(R-09b) CIRNAC recommended the City of Iqaluit conduct a bathymetric survey in 2023 and include a comparison of it to the bathymetry used for the Lake Geraldine Water Balance modelling in the 2023 Annual Report.

Comment on the City of Iqaluit's Response:

(R-09b) Bathymetric Survey It is understood that weather delays prevented completion of this item before submission of the 2023 Annual Report. CIRNAC recommends an updated schedule and plan be provided to complete this work.

*City of Iqaluit's Response:*

*The City of Iqaluit contracted GeoVerra to complete a bathymetric Survey in 2024. The results have been sent to our engineering consultant WSP to update the water balance model.*

# C. CIRNAC COMMENTS ON THE 2023 ANNUAL REPORT

## 2. Sampling for the monitoring and QA/QC program

Recommendation:

(R-02a) CIRNAC recommended the City of Iqaluit update the 2023 Annual Report with the monitoring and sampling analytical results in accordance with Schedule I of the Water Licence.

(R-02b) CIRNAC recommended the City of Iqaluit provide an update if they are on track for meeting the Schedule I of the Water Licence commitments for 2024. In particular, it is requested that the City follows the monitoring and sampling requirements in 2024 for the following monitoring stations:

- that had missing samples in 2023 (i.e. IQA-01, IQA-02, IQA-04, IAQ-05, and IAQ-06), and
- related to the Waste Transfer Station and North 40 Landfill (i.e. IQA-15, IQA-16, SW-1 to SW-3, WS-100, WS-101, WS-102, 19MW-01 to 19MW-05, W-107 to W-111).

*City of Iqaluit's Response:*

*(R-02a) Unfortunately, due to the extensive data the city has collected on monitoring and sampling analytical results over the year, it is not possible to change the format to match Schedule I of the Water Licence. However, moving forward, the city will strive to provide the data in a table similar to Schedule I of the Water Licence, if feasible.*

*(R-02b) Unfortunately, due to staff changes and other administrative issues the City faced in 2023, the missing samples were not taken. Additionally, the North 40 landfill and the Waste Transfer Station were still under construction in 2023, and the sample wells have yet to be installed to begin sample collection. The City aims to have the sample wells installed before the North 40 landfill and the Waste Transfer Station become operational so that samples can be taken.*

## 3. ATCO Loop decommissioning and Federal Road Utilidor Extension

Recommendation:

(R-03) CIRNAC recommends the City of Iqaluit clarify whether construction activities on the ATCO Loop sanitary sewer and watermain decommissioning and Federal Road Utilidor/ Watermain Extension were undertaken under Water Licence 3AM-IQA1626 and, if not, whether approval from the Nunavut Water Board has been obtained for these construction activities.

City of Iqaluit's Response:

No, it was our understanding the City did not need approval for infrastructure replacement projects. Approval was required for new infrastructure only.

CIRNAC's Reply to the City of Iqaluit's Response:

The City has not clarified whether or not these works were carried out under Water Licence 3AM-IQA1626. The City's response indicates that they carried out the works with the understanding that no approval was required. It should be clarified with the City that, if undertaken under the existing Licence, reporting is still needed.

*City of Iqaluit's Response:*

*The City of Iqaluit confirms that the construction activities on the ATCO Loop sanitary sewer and watermain decommissioning and Federal Road Utilidor/Watermain Extension were undertaken in direct relation to the existing water distribution system. These activities did not involve any new water usage outside of the existing scope defined under Water Licence 3AM-IQA1626. Therefore, no actions concerning the Water Licence were required.*

*Additionally, the projects were conducted on land and did not conflict with the regulatory territorial process or require additional permitting. The scope of the Water Licence includes various activities related to the management and protection of water resources and waste treatment facilities but does not specifically reference water distribution or wastewater collection systems. Please clarify what approvals are required for these types of work.*

## 6. Future Wastewater Treatment Plant studies planned

Recommendation:

(R-06) CIRNAC recommends the City of Iqaluit provide an update on future Wastewater Treatment Plant studies planned as per Schedule B item o.

*City of Iqaluit's Response:*

*The City of Iqaluit has no future Wastewater Treatment Plant studies planned.*

## 7. Un-authorized discharges and spills

Recommendation:

(R-07a) CIRNAC recommends the City of Iqaluit provide the estimates or ranges for spill volumes when precise measurements are not available. If estimating is not possible, explain why.

(R-07b) CIRNAC recommends the City of Iqaluit provide clarification on how it was determined that the average volume spilled was less than 100 litres.

(R-07c) CIRNAC recommends the City of Iqaluit provide more details on the follow-up actions, especially if they differ between incidents. Provide details on how spills were collected and disposed of and specify if additional monitoring or corrective actions were taken.

(R-07d) CIRNAC recommends the City of Iqaluit provide information on spills in addition to the reported wastewater spills.

City of Iqaluit's Response:

(R-07a) Due to the nature of spills there are no known estimates on their volumes and there is no process to estimate these values.

(R-07b) This value provide was a broad estimation as all spills vary is size and duration.

(R-07c) Most spills that occur are due to a back up in the system. These back ups are cleared out by the operations team and disposed off after testing. Depending on the results of the test, if results show contamination waste is handed over to Qikiqtaaluk Environmental (QE) but if the results are clear the waste is disposed of in the lagoon.

(R-07d) There are no other spills that were not reported is 2023.

CIRNAC's Reply to the City of Iqaluit's Response:

It is recommended that the City of Iqaluit develop a clear spill reporting process to capture (estimate) volumes and a reporting mechanism.

*City of Iqaluit's Response:*

*The comment has been acknowledged. Moving forward, the City will quantify the volume of spills based on the available information.*

## 9. Dam Safety Inspection Reports – Construction Works

Recommendation:

(R-09a) CIRNAC recommends the City of Iqaluit provide a table in the 2023 Annual Report that lists the outstanding recommendations from the DSI reports. The table should list the DSI recommendations, list the proposed actions to address the recommendations and/or updates on continuing actions to address

the recommendations, provide a column showing the recommended timeline for completion of the recommendations (as stated in the DSI reports), and a column showing the date when the City intends to resolve the recommendations.

(R-09b) CIRNAC recommends the City of Iqaluit clarify the required timeline for completion of the following:

a. Removal of the contaminated soil around the base of the hydro pole adjacent to the south berm.
b. Removal and replacement of the contaminated soil atop the center and north berms.
c. Installation of new rip-rap material within the upstream face of the north and center berms before the reservoir is re-filled.
d. Minor work required to repair erosion damage within the north access road and new steel culverts.
e. Outstanding deficiencies remaining to be corrected by Nunavut Excavation.
f. Repair of the depressions at the base of the upstream face of the center and north berms.
g. Repair of cracks within the concrete dam.

*City of Iqaluit's Response:*

*The City of Iqaluit has since performed a dam safety inspection in 2024. The dam inspection report for 2024 provides an update on the deficiencies from the 2023 DSI report and their status. This report will be provided in the 2024 annual report, along with approximate dates for when the City intends to resolve the recommendations.*

**10. Dam Safety Inspection Reports – Engineering Studies/Investigations and Design Works**

Recommendation:

(R-10) CIRNAC recommends the City of Iqaluit provide a table in the Annual Reports that lists the outstanding recommendations from the DSI reports. In the table list the DSI recommendations, list the proposed actions to address the recommendations and/or updates on continuing actions to address the recommendations, provide a column showing the recommended timeline for completion of the recommendations (as stated in the DSI reports), and provide a column showing the date when the City intends to resolve the recommendations.

*City of Iqaluit's Response:*

*The City of Iqaluit has since performed a dam safety inspection in 2024. The dam inspection report for 2024 provides an update on the deficiencies from the 2023 DSI report and their status. This report will be provided in the 2024 annual report,*

*along with approximate dates for when the City intends to resolve the recommendations.*

**11. 2023 Sample Results**

Recommendation:

(R-11a) CIRNAC recommends the City of Iqaluit advise if consideration has been given for exhaustion of GAC media and its ability to continue to remove hydrocarbons.

(R-11b) CIRNAC recommends the City of Iqaluit compile the lab results in an Appendix table with comparison to the applicable guidelines. City of Iqaluit's Response: The GAC media was installed in 2022. It has a life span of approximately 10 years. As the GAC media has been functioning as expected, the City does not expect it to be exhausted in the near future.

CIRNAC's Reply to the City of Iqaluit's Response:

The City of Iqaluit provided a response addressing R- 11a. The comment indicates that GAC media has been functioning as expected. However, third-party analytical results from the 2023 Annual Report show that the GAC media is not providing TOC reduction, which would be expected for GAC media of this age. This could indicate that the media is becoming exhausted for the adsorption of organics in the water. This could impact the capacity for hydrocarbon removal if hydrocarbons were detected in the raw water. The City of Iqaluit did not respond to R-11b.

*City of Iqaluit's Response:*

*The City is awaiting a response from WSP and will address the comment once a response is received.*

**12. Water Treatment Plant Report**

Recommendation:

(R-12) CIRNAC recommends the City of Iqaluit provide information on how GAC capacity is being tracked and steps that are in place in the event that the GAC media has reached capacity and requires replacement.

City of Iqaluit's Response:

GAC capacity is monitored using post-filter turbidity. There are set points for turbidity that trigger a backwash when exceeded. If turbidity levels remain below the set points for a certain period, the filter will still initiate a backwash based on a timed schedule to ensure the media stays fresh. If the media were exhausted, turbidity levels would not decrease after a backwash, or the frequency of backwashing would increase, indicating the media isn't being cleaned effectively. We do not anticipate frequent media replacements.

CIRNAC's Reply to the City of Iqaluit's Response:

The GAC filter media can remove contaminants through two different mechanisms: filtration and adsorption. The response describes the process of monitoring filter performance for particle removal based on filtered water turbidity. This applies to both the current GAC media and the previously used anthracite media. While necessary for filter performance and particle removal, monitoring turbidity does not monitor the GAC media adsorption capacity, which is the mechanism that would be used for removing hydrocarbons.

The GAC media has a porous structure, allowing target contaminants to be adsorbed onto the media. The adsorbed contaminants are not removed from the media through backwashing, resulting in a finite number of adsorption sites. Over time, these sites will become exhausted, and the media will no longer be able to remove containments through adsorption (and will rely on filtration only). Other adsorbable contaminants in the water can further reduce the GAC capacity to remove a target contaminant. This results in the media having a site-specific expected useful life and timeline for replacement. Monitoring for additional parameters beyond turbidity should be considered for evaluating the GAC adsorption capacity over time (UV254 could be used as a surrogate parameter for organics, for example).

*City of Iqaluit's Response:*

*The City is awaiting a response from WSP and will address the comment once a response is received.*

**14. Chlorine and Bacteria Results from the WTP (2023)**

Recommendation:

(R-14) CIRNAC recommends the City of Iqaluit complete the following:

- review the UVT analyzer performance to confirm the system is working as intended and provide an update, and
- provide sample results from S::CAN monitoring device located at the water treatment plant.

*City of Iqaluit's Response:*

*The City has reviewed the performance of the UVT analyzer and confirms that the system is working as intended. The UVT analyzer undergoes a regular maintenance schedule, which includes a yearly calibration and additional calibrations as needed. To ensure the accuracy of the UVT readings, the City also uses a handheld device for verification.*

*Unfortunately, the City is unable to provide sample results from the S::CAN monitoring device as it can only store 4 months of data on a rolling time window. The City is working to provide a better storage system for the S::CAN monitoring device.*

## 15. 2024 Lake Geraldine Water Balance Assessment

Recommendation:

(R-15) CIRNAC recommends the City of Iqaluit provide the following:

- A full hydraulic lake balance model or more information on the watershed runoff approach,
- Update the bathymetric survey and development of new stage-storage curve, and
- Check the values in Table 2 for accuracy.

*City of Iqaluit's Response:*

*The bathymetric survey was updated in Fall 2024. The survey data was submitted to WSP to update the site's water balance model. The City will provide the revised model to the Board upon its completion and will incorporate any necessary findings into future planning and reporting.*

# APPENDIX