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TABLE 1

CITY OF IQALUIT
CITY OF IQALUIT MUNICIPAL WATER LICENCE

CITY OF IQALUIT WATER LICENCE AMENDMENT AND RENEWAL
RESPONSE TO TECHNICAL REVIEW COMMENTS FROM CANADA-INDIGENOUS RELATIONS AND NORTHERN AFFAIRS CANADA

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Technical Comment No.	Subject	Reference	Comment	Recommendation	City of Iqaluit Response	Attachment
CIRNAC-TR-01 Part a	Predicted Environmental Effects and Proposed Mitigation Measures - Surface Water Quality and Dewatering	Attachments 29, 36	The application does not provide sufficient information to assess the effects of discharging pond dewatering effluent to the Niaqunnguk (Apex) River. The PBSSR-LTWP states that several ponds in the LTWP area (i.e., within the access road alignment and reservoir footprint) will be permanently dewatered. Each of the ponds will be dewatered during construction, with the water discharged such that it will runoff into the Niaqunguk (Apex) River. It is noted that these ponds were sampled in 2024 but "the sampling parameters were those typically used to determine ecological potential and not for contaminants." As a result, the application lacks the water quality characterization necessary to determine whether the proposed discharge could adversely affect the receiving environment, whether treatment would be required, and what discharge criteria and monitoring should apply.	(TR-01) CIRNAC recommends that the City of Iqaluit provide the following: a) Confirmation of whether ponds have any known or suspected contaminant sources in their catchments or footprints	The Phase 1 ESA (Attachment 42) confirmed that there has been no development in the vicinity of the ponds, besides the placement of the temporary water pipeline from Apex River to Lake Geraldine. No Potential Areas of Environmental Concern (e.g., signs of contamination sources from human activities) were identified within the ponds and their catchments in the Phase 1 ESA (which included an on-foot site inspection of the ponds and their catchments). Therefore, it has been confirmed that there are no contaminant sources in the catchments and footprints of the ponds. The ESA did not indicate the need for the testing of contaminants. Note that the ponds already drain to Apex River or Lake Geraldine.	
CIRNAC-TR-01 Part b			The EPP and PBSSR-LTWP report list as a mitigation measure that a water treatment reservoir will be constructed to collect water from dewatering and construction areas, ensuring the removal of harmful substances, such as nitrogen compounds and sediment, before releasing the treated water into the natural environment. However, confirmatory sampling of surface water prior to discharge of such water to the Niaqunguk (Apex) River is not listed as a mitigation measure. Further, there are no discharge criteria (e.g., TSS, turbidity) or stop/trigger thresholds identified.	b) A monitoring plan for dewatering discharge (pre-discharge, during discharge, and downstream verification as appropriate) including discharge criteria	A construction phase water management and monitoring plan will be prepared by the technical meeting that outlines this information.	
CIRNAC-TR-01 Part c			Surface water monitoring at the proposed water sources (i.e., Niaqunngut (Apex) River and Lake Qikiqtalik) during the construction and operation of the LTWP is not listed as a mitigation measure for water quality although the Application notes that the City will identify new surveillance network program (SNP) stations for the LTWP prior to the start of construction.	c) A plan for surface water monitoring during construction and operation, including for contaminants, with the number of samples and their general locations	This will be presented in the construction phase water management and monitoring plan mentioned above.	
CIRNAC-TR-01 Part d			A mitigation measure listed in the EPP and the PBSSR-LTWP report is that an Erosion and Sediment Control Plan will be developed and implemented to effectively mitigate the environmental impacts of erosion and sediment runoff. It is unknown what this Erosion and Sediment Control Plan will contain.	d) Clarification on the content of the Erosion and Sediment Control Plan, including stockpile management	The Erosion and Sediment Control Plan is presented as Attachment 31 of the Application.	
CIRNAC-TR-01 Part e			The EPP indicates that the environmental aspects for the LTWP were developed based on the Valued Environmental Components (VECs) identified in the Draft Physical, Biological and Socioeconomic Impact Assessment (PBSEIA) report dated November 2023, and in alignment with the Proponent's Guide – NIRB Technical Guide Series (February 2020). However, the November 2023 PBSEIA is now outdated. The most current version of the report is dated September 29, 2025, which includes updates to previously identified "unknown" impacts, as well as revised analyses and reporting.	e) An updated EPP that considers changes made in the PBSSR-LTWP report	The City has not identified any obvious gaps in the EPP (Attachment 29) relative to the impacts identified in the PBSSR (Attachment 36). The selected contractor will be required to prepare its own EPP prior to construction based on the requirements of the new licence as well as the final issued for construction drawings. The City commits to submitting its final EPP (prepared by the contractor) to the Board for review when the IFC drawings are submitted 30 days prior to commencing construction, in accordance with Part F, Item 1 of the licence.	
CIRNAC-TR-02 Part a	Predicted Environmental Effects and Proposed Mitigation Measures - Soil Contamination, Surface Water Quality, and Blasting	Attachments 25, 29, 36	The application does not identify or assess the potential effects of blasting on surface water quality. While the PBSSR-LTWP states that ammonium nitrate fuel oil (ANFO) explosives will not be used, blasting activities will occur within the Project footprint, including in areas that will be dewatered. The EPP does not identify a pathway of effects between blasting residue and soil or surface water quality.	(TR-02) CIRNAC recommends that the City of Iqaluit provide the following: a) Identify the types of explosives to be used and their potential to generate residues that may affect soil or surface water quality	The City has assumed that a nitrogen-based explosive will likely be used, either ANFO or an emulsion-based explosive. Hence, monitoring for ammonia in runoff from construction areas will be required. This will be identiifed in the forthcoming construction phase water management and monitoring plan.	
CIRNAC-TR-02 Part b			The Blasting Assessment focuses on water overpressure but does not consider the potential for blasting-related residues (i.e., energetics) to affect soil and water quality. As a result, the application does not provide sufficient information to assess whether blasting activities could contribute to increases in parameters such as nitrogen compounds in runoff or dewatering effluent, and the potential effects on the receiving environment.	b) Describe the pathways by which blasting-related substances may enter surface water (e.g., runoff, seepage, or dewatering)	This will be presented in the construction phase water management and monitoring plan mentioned above.	
CIRNAC-TR-02 Part c			In the absence of this information, it is not possible to evaluate potential soil or water quality impacts associated with blasting or to determine whether specific mitigation, discharge criteria, or monitoring requirements are necessary.	c) Assess the potential effects of these inputs on the receiving environment	This will be presented in the construction phase water management and monitoring plan mentioned above.	
CIRNAC-TR-02 Part d			Additional information is required to characterize the potential effects of blasting on water quality and to identify appropriate mitigation and monitoring measures.	d) Include mitigation measures to minimize the release of blasting-related contaminants to soil and surface water in the EPP	This will be presented in the construction phase water management and monitoring plan mentioned above.	
CIRNAC-TR-03	Predicted Environmental Effects and Proposed Mitigation Measures - Soil Contamination	Attachment 42	While Arcadis completed an Enhanced Phase I Environmental Site Assessment (ESA) for the LTWP in 2023 and identified several Areas of Potential Environmental Concern (APECs), including the Iqaluit Shooting Range, the assessment did not fully consider the implications of reusing borrow material from these locations at other sites with different future land use designations. Soil sampling at the Shooting Range identified lead concentrations exceeding the Government of Nunavut (GN) Tier 1 Residential/Parkland criterion (70 mg/kg), although below the Industrial criterion (260 mg/kg). The application of Industrial criteria at the source location is understood; however, if this material is excavated and reused during construction, the suitability of the receiving environment must be considered. It is currently unclear whether the landfill would accept this lead-impacted soil as landfill disposal criteria have not been defined.	(TR-03) CIRNAC recommends that the City of Iqaluit provide the following: a) Further investigation be conducted at the Shooting Range to delineate the extent of lead impacts prior to excavation or re-use of such soil	The City acknowledges that lead-contaminated soils may exist in the berms and in the immediate area at the shooting range, and that this could preclude their use in construction of the LTWP. The City will consider this matter further. Regardless, the City will not use any soil for construction of the reservoir that exceeds the GN's Tier 1 Residential/Parkland criterion for lead. Soil exceeding the Industrial criterion for lead will not be used for construction of ancillary infrastructure (for example, roads) unrelated to the storage of water.	
				b) A reuse assessment be completed that considers the land use and exposure pathways at proposed placement locations, to ensure consistency with applicable GN soil quality criteria		
				c) In the absence of sufficient delineation or reuse analysis, soils from the Shooting Range and surrounding area be conservatively managed as contaminated and not reused in areas accessible to the public		
				d) The Proponent confirm whether the West 40 Landfill would accept this material, recognizing that landfill acceptance criteria have not been defined to date		
				e) Potential pathways for migration of lead-impacted material to nearby water bodies be evaluated and, if warranted, incorporated into mitigation and management measures		
CIRNAC-TR-04	4.Studies and Designs: Site Specific Data and Analysis to Support the Design and Management Decisions - Cascading Effects of Upstream Dam Structure Failures	Attachment 8, 9	The 2024 Dam Safety Review indicates that the Lake Geraldine Dam remains an Extreme Consequence dam based on Canadian Dam Association (CDA) Dam Safety Guidelines classification (2013). The review also notes that the inundation maps used to support this classification were developed in 2012 and have not been updated, although the downstream environment was considered generally comparable to conditions at the time those maps were prepared. The Dam Safety Review is focused specifically on Lake Geraldine Dam, including a condition assessment, design adequacy, hydrotechnical review, freeboard, structural stability, instrumentation, and dam safety management. The review does not include an assessment of cascading effects arising from failure of dam structures as proposed upstream of Lake Geraldine.	(TR-04) CIRNAC recommends that the City of Iqaluit provide the following: a) Clarification of whether failure of any proposed upstream dam structures, reservoirs, or other hydraulic controls could result in cascading effects at Lake Geraldine.	Yes, the proposed new reservoir is hydraulically linked to Lake Geraldine and could cause cascading effects. The initial Inundation Study will be preliminary in nature until the project design is finalized (i.e., reservoir volume and dam/dyke sizing and footprint finalized). The initial report will outline what is currently perceived to be the worst case scenario - a total loss of Dam 1 and the LG Dam based on the 50% Design Report. A full dam breach analysis, to follow at a later date, will assess whether the failure of the upper reservoir could lead to failure or unsafe conditions at the Lake Geraldine Reservoir. A full Inundation Study will follow once the design (i.e., reservoir volume and geometry, dam/dyke footprints and sizes) is finalized.	
			The 2012 Dam Breach Analysis & Inundation Mapping Study evaluated hypothetical breach scenarios for the Lake Geraldine concrete dam/spillway and central berm, including breach hydrographs, mapped inundation extent, and infrastructure at risk. The objectives and methodology of that study are directed toward understanding the consequences of a Lake Geraldine Dam failure. The study does not include any upstream breach scenario, compounding failure scenario, or cascading failure assessment. None of the documentation provided includes an assessment of cascading failure on the Lake Geraldine Dam from a dam break of the proposed structures upstream of Lake Geraldine included in the licence renewal application.	b) If such structures and/or scenarios exist, an assessment of the potential effects on Lake Geraldine Dam performance, reservoir conditions, flood routing, inundation, and consequence assessment.	A dam breach analysis will be conducted prior to construction in accordance with Canadian Dam Association (CDA) Dam Safety Guidelines. The analysis will consider the potential for cascading effects, as mentioned above. Emergency preparedness and response plans will be developed and scaled based on the results of the analysis. The initial Inundation Study will be preliminary in nature until the project design is finalized (i.e., reservoir volume and dam/dyke sizing and footprint finalized). The initial report will outline what is currently perceived to be the worst case scenario.	
CIRNAC-TR-05	Studies and Designs: Site Specific Data and Analysis to Support the Design and Management Decisions - Dam Safety Inspections / Dam Safety Review	Attachments 8, 9	Dam Safety Inspections (DSI), and/or Dam Safety Reviews (DSR) are required to be completed each year for the Lake Geraldine water supply facility. Twelve deficiencies from the 2024 DSI are noted in the 2024 DSR along with their recommended mitigations. CIRNAC acknowledges that the City is monitoring thermistors and recognizes that temperature trends are important for permafrost/embankment thermal regime and seasonal stability considerations. However, monitoring only thermistors does not satisfy the full intent of data collection from installed instrumentation. From a dam safety perspective, pore pressure data that can be collected using a piezometer is typically the most direct early indicator of internal erosion potential, changing seepage gradients, and hydraulic response during reservoir level changes and freeze thaw cycles. CIRNAC acknowledges the City has retained a third party to repair or relocate the Lake Geraldine intake valve, and that design in progress will be implemented in 2026. CIRNAC acknowledges that the City is "looking into" installing monitoring instrumentation at the spillway in 2026.	(TR-05) CIRNAC recommends that the City of Iqaluit provide the following: a) Report on the design progress and anticipated implementation of the Lake Geraldine intake valve	This work was awarded as design-build in 2025, and issued for construction (IFC) drawings will be submitted to the Board in the coming weeks, 30-days before construction in accordance with the terms of the current licence. The work is expected to be completed by the end of August 2026.	
				b) A detailed plan that describes how the identified deficiencies will be addressed within the timelines provided in the DSR and DSI	The City's detailed plan to address the DSI/DSR deficiencies is presented as Attachment A.	Attachment A - DSI/DSR Deficiency Action Plan

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CIRNAC-TR-06	Studies and Designs: Site Specific Data and Analysis to Support the Design and Management Decisions - Permafrost	Attachments 08, 16, 38	Section 3.3.7 of the Application indicates that the dam and dykes will be founded on prepared bedrock surfaces, suggesting limited influence of permafrost on foundation conditions. However, the Application does not clearly demonstrate how permafrost dynamics have been considered over the long term. Reservoir impoundment is expected to result in thawing of underlying permafrost and development of a talik, including along reservoir margins, which may create potential seepage pathways beneath containment structures or through adjacent terrain. The Application does not clearly indicate whether potential seepage losses associated with permafrost degradation have been evaluated, or how such risks would be managed. Section 3.3.8.3 of the Application describes a buried, heated service corridor between the reservoir and Lake Geraldine. Available geotechnical information (Attachment 38) does not clearly demonstrate that this alignment has been fully characterized. While portions of the alignment may be founded on bedrock, localized fractured bedrock and/or thicker overburden may be present. The potential for permafrost degradation associated with the heated corridor, and the resulting risk of preferential seepage along or adjacent to the structure, are not clearly addressed. In addition, the *Lake Geraldine Dam Safety Review* (Attachment 8) includes recommendations related to monitoring and potential permafrost impacts, including: • implementation of additional monitoring (pore pressure, temperature, and displacement) at the spillway; and • establishment of a performance monitoring program for existing instrumentation, including data management and reporting (e.g., dashboard development). Section 3.1 of the Application indicates that deficiencies and associated deadlines were identified in the 2025 Dam Safety Review; however, the Application does not clearly describe the status of these recommendations or progress toward their implementation, nor how they have been incorporated into the proposed project design and monitoring framework.	(TR-06) CIRNAC recommends that the City of Iqaluit provide the following; a) Clarification of how permafrost conditions, including potential thaw and talik development associated with reservoir impoundment, have been considered in the design of the dam, dykes, and adjacent terrain	The dam and dykes which form the perimeter of the reservoir will be founded on a competent bedrock surface of which some will be above the permafrost zone while others will be below. All water retention structures will also be founded on a prepared competent bedrock surface, with liners keyed into competent rock. RQDs calculated from bedrock samples recovered to date are relatively high, and the bedrock is expected to be relatively impermeable. Furthermore, the bedrock formation is very ice poor and as such very little groundwater is moving through this zone. Further geotechnical testing has been recommended to obtain more supporting data, at each structure and also at areas adjacent structures. The permeability of the bedrock is not expected to be affected by permafrost thaw and talik development. The permafrost conditions will be monitored post construction via the instrumentation (thermistors and piezometers, among others) which will be installed within all water retention structures as well as adjacent terrain.	
				b) Assessment of the potential for seepage losses resulting from permafrost degradation beneath and adjacent to containment structures, and describe how such risks will be monitored, managed, and mitigated	On the basis of the information collected to date, it is expected seepage through the bedrock will be minimal and will not be readily distinguishable from any seepage arising from water passing through the liner material that comprises the water barrier within the upstream slope of the water retention structures. Containment structures will be heavily instrumented to monitor any potential seepage, the active layer, and any progressive permafrost degradation. Potential seepage (including through and around liner) has been modelled in the most recent technical memo, and is an ongoing part of design. Seepage potential through the competent bedrock (primary founding surface) is expected to be low if not non-existent. Further geotechnical testing has been recommended to obtain more supporting data.	
				c) Additional geotechnical characterization along the service corridor alignment, as required, to confirm subsurface conditions relevant to design and permafrost stability	The service corridor will be trenched into compentent bedrock under the Dam 1 foundation, itself founded on competent bedrock and prepared with dental concrete. The inlet will be sealed as part of Dam 1 construction. The surrounding bedrock is expected to be relatively impermeable and unaffected by permafrost thaw/talik progression. Additional geotechnical testing in the service corridor area has been recommended to obtain more supporting data.	
				d) Evaluation of the potential for permafrost degradation associated with the heated service corridor and its implications for seepage and structural performance, and description corresponding mitigation measures	Please see above. Service corridor backfill will be a robust aggregate, constructed in tandem with the Dam 1 foundation, and with the potential to be grouted if deemed necessary. Any seepage through the corridor would ultimately outlet to Lake Geraldine, at the reservoir discharge point.	
				e) Clear description of how investigative findings, design assumptions, and mitigation measures related to permafrost and seepage are integrated into construction and operational plans	The nature of the site conditions in the area of the reservoir are such that any impacts from any changes to the permafrost regime in the area beneath the water retention structures and the reservoir itself will be minimal, as it relates to potential deformation and seepage impacts. As noted earlier the nature of the bedrock on site is such that groundwater migration is expected to be minimal and could not be readily distinguished from seepage that would be arising from water movement through the geocomposite liner system which will be keyed into the competent bedrock. The monitoring of permafrost conditions will be done during construction using instrumentation (thermistors) installed as part of the investigation progam while a comprehensive instrumentation program for monitoring of peizometeric conditions, vertifcal and horizonal movement (inclinometers and survey monuments) as well as the thermal conditions will be installed as part of the construction for the purposes of long term monitoring of conditions in the future. An Operation, Monitoring and Surveillence (OMS) plan will be prepared for the water retention structures associated with the reservoir and it will be the responsibitiy of the City to ensure the conditions of the OMS are adhered to.	
				f) An update on the status of Dam Safety Review recommendations (Attachment 8), including actions taken or planned with respect to the following: a. enhanced monitoring of pore pressure, temperature, and displacement at the spillway; and b.implementation of a performance monitoring program for existing instrumentation, including data management and reporting.	The City's detailed plan to address the DSI/DSR deficiencies is presented as Attachment A.	Attachment A - DSI/DSR Deficiency Action Plan
				g) Confirmation of how these monitoring recommendations have been incorporated into the overall monitoring and adaptive management framework for the Project	The City is not sure the intent of this recommendation, if it is related to the LTWP (as parts a to e) or related to the Lake Geradine dam safety deficiencies referenced in part f?	
CIRNAC-TR-07	Studies and Designs: Site Specific Data and Analysis to Support the Design and Management Decisions - Water Balance	Attachments 12, 13, Table 1	As part of the Completeness Assessment submitted to the City of Iqaluit on February 6, 2026, CIRNAC recommended that the City provide an updated Lake Geraldine Water Balance Model (Comment 2026-02-06-IR#08). In the City of Iqaluit's Table 1 – City of Iqaluit Water Licence Renewal/Amendment Application Response to Initial Information Requests document, the City indicated that Attachments 12 and 13 as part of the April 24, 2026 (Rev 1) application include the original Lake Geraldine Water Balance Model and associated updates. A review of this material indicates that an updated Lake Geraldine Water Balance Model, incorporating the most current available data, has not been provided. An updated water balance model is required under Part D, item 11, of the current licence at least 30 days prior to the start of water withdrawals from the Niaqunguk River (Apex River) at Monitoring Station No.: IQA-10. No updated water balance model has been submitted since new bathymetric data of Lake Geraldine was captured. The Attachment 13 – Lake Geraldine Water Balance Model Calibration Update – 2024 Refinement and Validation technical memorandum included in the Rev 1 application documents the recalibration and validation of the Lake Geraldine Reservoir Water Balance Model using the 2024 bathymetry data, and does not include forecasting or reporting-year analysis. The technical memorandum does not assess projected 2025 reservoir conditions or forecast potential risk for the 2026 winter period. The Lake Geraldine Water Balance Model Calibration Update report identifies gaps in available data and notes the potential influence of ice pressure, which was not considered in the calibration and validation process. The report notes: "It is recommended to complete the identified data gaps, including daily water consumption and emergency pumping volumes from 2018 and 2019, to allow for an extended calibration period. Also, it is recommended to verify the potential impact of ice pressure on water level measurements during the lake's ice-covered period."	(TR-07) CIRNAC recommends that the City of Iqaluit provide the following in accordance with previous recommendations: a) An updated completion schedule for the Lake Geraldine Water Balance Model and submit the updated Water Balance Model report once it is finalized.	The water balance being referred to is a GoldSim water balance that was developed by WSP for the purposes of predicting long-term water supplementation requirements for Lake Geraldine. This model, while useful for long-term planning (because it considers long-term weather patterns), is not a practical tool for estimating annual water supplementation requirements. The amount of water supplementation needed each open water period is a simple function of the amount of water remaining in the reservoir and the forecasted consumption. For this reason, the City has developed an Excel-based water balance for Lake Geraldine that it has been using as a planning tool to determine supplementation requirements each year (Attachment B). The daily water levels (stage measurements) in the reservoir are entered and the volume of water in the reservoir is calculated using a lookup table that relates stage to storage volume. The "deficit" (the difference between the current volume and the volume of the full reservoir) can be calculated, as well as the number of pumping days to refill the reservoir. A hydrograph is developed based on daily stage measurements and compared with that of previous years dating to 2018.	Attachment B - Lake Geraldine Water Balance Tool
				b) An updated and recalibrated Lake Geraldine Water Balance Model to include water consumption data and emergency pumping volumes for 2018 and 2019	An updated and recalibrated Lake Geraldine Water Balance Model to include water consumption data and emergency pumping volumes for 2018 and 2019 was recommended for the next model update. This enhancement would improve the overall accuracy and representation of historical conditions; however, it is not expected to significantly alter the model outcomes or key conclusions. Additionally, the City is currently using an excel-based water balance tool to forecast water pumping requirements from year to year (Attachment B).	Attachment B - Lake Geraldine Water Balance Tool
				c) An updated and recalibrated Lake Geraldine Water Balance Model with verification of the potential impact of ice pressure on water level measurements during the lake's ice-covered period	The effects of ice primarily impact the accuracy of water level measurements and are not expected to materially influence the overall water balance or model conclusions. The potential influence of ice conditions during the ice-covered period can be evaluated by comparing observed water levels with model-derived storage trends. Any minor discrepancies identified are likely attributable to measurement bias associated with ice effects. Where warranted, seasonal corrections may be applied, or winter data may be weighted or excluded to enhance calibration robustness. This refinement can be incorporated in a future update of the GoldSim water balance model.	
CIRNAC-TR-08	Studies and Designs: Site Specific Data and Analysis to Support the Design and Management Decisions - Lake Qikiqtalik Volume and Withdrawal Guidance Values	Attachments 36, 32	The Water Withdrawal Study relies on Water Survey of Canada (WSC) hydrometric stations to estimate runoff and flow conditions; however, limitations in the underlying datasets introduce uncertainty that is not fully addressed. • Station 10UH015 ("Apex River 1 km Above Bridge to Nowhere") is identified as having intermittent data and lacking a sufficient period of record, yet is used to support the development of a synthetic dataset. The basis for this approach and the suitability of this station to represent watershed conditions are not clearly demonstrated. • The dataset for Station 10UH002 was modified to exclude the period from 1973 to 1988 due to transition issues between manual and digital records. The implications of excluding this data on the robustness of the analysis, including model calibration and flow estimation, are not clearly described.	(TR-08) CIRNAC recommends that the City of Iqaluit provide the following: a) A comparative assessment of physiography, watershed storage characteristics, and permafrost conditions among the selected WSC stations to demonstrate their suitability for estimating runoff and flow conditions for the Project	The analysis does not transpose flows from a distant or dissimilar basin. All assessment locations are nested points on the same river within the same Apex (Niaqunguk) River watershed: WSC 10UH015 (Apex River 1 km Above Bridge to Nowhere, coincident with licensed monitoring station IQA-10), the Apex Confluence, and WSC 10UH002 (Apex River at Apex) (Attachment 37: Figure 3-1). The catchment areas are 3,602.07 ha, 4,906.10 ha and 5,371.23 ha respectively, so the two ungauged locations lie entirely within the gauged 10UH002 catchment, with incremental contributing areas of only 669.7 ha and 465.1 ha (Attachment 37: Table 3-3, Figure 3-2). Because the assessment points are internal to the gauged catchment, they share a common physiographic, storage and permafrost setting. The watershed consists of low-relief, glacially scoured igneous and metamorphic terrain. Surficial geology mapped from the Geological Survey of Canada 1:100,000 surficial data model comprises till blanket (58%), till veneer (23%), bedrock, water and lake (Attachment 34: Section 5.3, Table 5-3, after Golder Associates Ltd., 2021 - Attachment C). Relief across the catchment is minor, which is why a single snowpack elevation band was sufficient in the HECHMS model (Attachment 34: Section 6.2.1). Lake and wetland storage, including the 634.37 ha Qikiqtalik Lake subwatershed, was explicitly delineated and represented with elevation-storage curves derived from Tetra Tech's 2019 bathymetric survey and LiDAR (Attachment D and Attachment 34: Sections 5.1 and 5.4, Figures 5-5 to 5-7). The Apex River synthetic data set for the Confluence excludes Qikiqtalik Lake contributions, so lake storage is not double-counted between the two withdrawal configurations (Attachment 37: Section 3.1). The entire study area lies within the continuous permafrost zone of southern Baffin Island (City of Iqaluit, 2022; Mathon-Dufour, 2016; Britannica, Nunavut). Frozen ground and near-surface bedrock conditions were represented in the runoff modelling through an SCS Curve Number of 87, reflecting the low infiltration capacity of the area (Attachment 34: Section 5.3). The transfer between 10UH002 and 10UH015 does not depend on an assumption of physiographic similarity. It uses seasonal scaling factors derived by Nunami Stantec (2023) from concurrent discharge measurements at the two stations, so any residual within-basin differences are captured in the observed flow ratios (Attachment 37: Section 3.1). On this basis the City considers the selected stations suitable for estimating runoff and flow conditions for the Project.	Attachment C - Lake Qikiqtalik Water Balance Assessment (Golder, 2021) Attachment D - Lake Qikiqtalik Bathymetry Report (Tetra Tech, 2019) Attachment E - Apex River Fisheries and Hydrologic Information (Nunami Stantec, 2023)

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				b) Description of the methodology used to develop the synthetic dataset for Station 10UH015, including assumptions, limitations, and associated uncertainties	The methodology is documented in Attachment 37: Section 3.1 and illustrated in Attachment 37: Figures 3-2 and 3-3. The steps were as follows: 1. Daily mean flows were obtained from WSC 10UH002 (Apex River at Apex), restricted to the automated digital-era record (1989 to 2021, providing 23 usable years) and to the April to October open-water withdrawal season. Missing days are itemized by year in Attachment 37: Table 3-2. 2. Extreme freshet measurements were removed using the Inter-Quartile Range method, with an upper bound of Q3 + 1.5 IQR = 3.725 m^3/s (Attachment 37: Table 3-4). All removals are itemized by year and volume in Attachment 37: Table 3-5. This step prevents rare extreme events from inflating the projected withdrawable capacity of the river and is therefore conservative for supply planning (Attachment 37: Section 3.1.1). 3. Seasonal scaling factors of 0.513 (August and September) and 0.746 (all other months), developed by Nunami Stantec (2023) from concurrent 10UH002 and 10UH015 measurements, were applied to represent 10UH002 flows at 10UH015 (Attachment 37: Section 3.1). 4. For the Apex Confluence, the scaling factors were prorated upward by the approximately 19% increase in catchment area, excluding Qikiqtalik Lake contributions (Attachment 37: Section 3.1, Figure 3-2). The intermittent 10UH015 record was not used as the statistical basis for flow estimation. Its role was limited to establishing concurrent flow ratios against the long-term 10UH002 gauge; all long-term flow statistics derive from the 33-year 10UH002 record. Results must nonetheless be expressed at 10UH015 because it is coincident with monitoring station IQA-10, the control point specified in Type A Water Licence 3AM-IQA1626 (Attachment 37: Sections 2.0 and 3.2). The principal assumptions are that runoff generation is approximately proportional to catchment area within the basin, and that the seasonal scaling relationship is stationary between years. The main limitation is stated in the technical memo (Attachment : the Stantec factors were derived from a single concurrent year (2021), so the synthetic series is representative of the 2021 hydrological climate, and the factors could differ if a longer concurrent record were available (Attachment 37: Section 3.1, p. 5). Uncertainty is carried through the analysis by reporting minimum, mean and maximum annual discharge and withdrawable volumes for every scenario rather than single deterministic values (Attachment 37: Tables 4-1 to 5-4). The approach is consistent with the methodology previously applied in Stantec's fisheries and hydrology assessment of the Apex River (Nunami Stantec, 2023). The City also notes that licensing risk arising from synthetic-data uncertainty is limited in practice, because the licence conditions operate on measured instantaneous flow at IQA-10 (withdrawal permitted only above 30% of MAD and capped as a percentage of instantaneous flow). Real-time compliance is therefore governed by observed conditions rather than by the synthetic series.	
			Collectively, the Application does not clearly demonstrate that the selected stations are representative of the study watershed in terms of physiography, storage characteristics, and permafrost conditions, as required to support the hydrologic analysis.	c) Assessment of the implications of excluding the 1973–1988 dataset from Station 10UH002 on the hydrologic analysis	The rationale for the exclusion is given in Attachment 37Sections 3.1 and 3.1.1. Around 1989, WSC station 10UH002 transitioned from manual readings to automated digital measurements of higher quality and frequency, and only from approximately 1989 onward did the station capture transient sub-ice discharge during winter months. The pre-1989 and post-1989 records are therefore not homogeneous, and blending them would not provide an appropriate one-to-one comparison. The retained 1989 to 2021 record provides 23 usable years of daily data collected to a consistent standard, which is adequate for estimating MAD and annual volume distributions. Missing days are fully documented (Attachment 37Table 3-2) and their effect on observed annual totals is quantified in the Attachment 37(a MAD-based April to October volume of approximately 13,700,000 m^3 against an observed average of approximately 11,200,000 m^3; Attachment 37Section 3.1). The direction of the effect is protective. The pre-1989 manual record systematically under-reports flow because it did not capture sub-ice discharge and was collected at lower frequency. Had it been retained, the computed MAD and IQR would be biased low, and a lower MAD would lower the 30%-of-MAD withdrawal threshold, permitting pumping at lower river flows. Excluding the biased data yields a higher and better supported instream-flow threshold. For the same reason, the IQR was computed on April to October data only, so that effectively non-withdrawable sub-ice flows do not skew the statistics (Attachment 37Section 3.1.1). The exclusion has no bearing on model calibration. The Qikiqtalik Lake HEC-HMS water balance was calibrated to 2023 and 2024 site measurements collected by AAE Tech Services and to stage-discharge data provided by Dr. Richardson of Carleton University (Attachment 34 Section 6.5); it does not use the pre-1989 WSC record. The treatment is consistent with the homogeneity screening applied to the precipitation record, where pre-digital (pre-1995) measurements were shown to understate totals relative to modern instrumentation (Attachment 34 Section 5.2.2, Figure 5-2). Instrumentation-change effects of this kind are documented in the Arctic monitoring literature (Brown, Smith, Derksen and Mudryk, 2021, cited in Attachment 34 Section 6.2.2).	
			An inconsistency was noted in the Physical, Biological and Socioeconomic Screening Report, Long Term Water Project – Supply and Storage for Lake Qikiqtalik under ice volume. Volume is stated as 4,737,900 cubic metres on page 2-20 and 4,616,900 cubic metres on page 1 in section 2.2.4.3.	d) Confirmation of whether a sensitivity analysis of the model environmental assessment (MEA) or hydrologic model was completed to evaluate the influence of dataset exclusions and assumptions, and provide the results of such analysis. Reconcile the inconsistency and confirm the volume of Lake Qikiqtalik.	Sensitivity and uncertainty analyses were completed and the results are reported. The principal uncertainty analysis is the Monte Carlo assessment: 6,000 year-long HEC-HMS simulations, generating 2,190,000 daily discharge samples, in which monthly precipitation (log-normal) and initial snow water equivalent (normal) were sampled from fitted distributions, consistent with the HEC-HMS uncertainty-analysis framework (Attachment 34 Sections 1.0 and 6.6; HEC, 2023). Results are reported as a full percentile distribution of annual outflow (Table 8-2, Figures 8-1 to 8-5) rather than as a single value. Sensitivity to specific inputs and assumptions was also evaluated. Calibration testing showed the model to be highly sensitive to the outlet stage-discharge relationship; this finding is reported and directly supports the recommendation to formalize and maintain the lake outlet (proposed weir) and to re-derive the rating once it is constructed (Attachment 34 Sections 6.3 and 9.0). Model behaviour with and without the south catchment was evaluated during calibration, and the final model includes it (Attachment 34 Section 5.1). The climate-normal window was tested across three alternatives (1946 to 2024, 1991 to 2020, and 1995 to 2024; Attachment 34 Section 5.2.2, Figure 5-2), and three independent snow water equivalent datasets were compared before selection (AHCCD 320.55 mm; ten-to-one normals 144.6 mm; Richardson 206 mm; Attachment 34 Section 6.2.2). Parameter-level sensitivity assessments were conducted wherever parameter values were uncertain (Attachment 34 Section 6.2.1). For the Apex River desktop study, uncertainty arising from data screening is bounded by reporting minimum, mean and maximum annual volumes for every scenario (Attachment 37Tables 4-1 to 5-4). The evolution of the withdrawal estimate between the interim and Attachment 34s (719,000 m^3 to 1,284,184 m^3) also demonstrates the sensitivity of results to the precipitation implementation and the inclusion of the south catchment (Attachment 34 Executive Summary and Section 9.0). Regarding the volume inconsistency, the discrepancy between 4,737,900 m^3 (p. 2-20) and 4,616,900 m^3 (Section 2.2.4.3) in the Screening Report is acknowledged. The correct under-ice volume of Lake Qikiqtalik is 4,737,900 m^3, as derived from the Tetra Tech (2019) bathymetric survey and the associated elevation-storage relationship (Attachment 34 Section 5.4, Figure 5-5). The second figure is a typographical carry-over from an earlier version. The City notes that the difference of approximately 121,000 m^3 (about 2.6%) does not affect the withdrawal assessment, which is based on modelled renewable annual outflow (Attachment 34 Section 8.4), not on static under-ice storage.	
			The LTWP Lake Qikiqtalik Water Withdrawal Study states median annual discharge of approximately 1,681,676 m^3 and proposes a withdrawal of approximately 1,284,184 m^3 as “best estimate to use for planning”. The report also states that “We remain confident that 1,100,000 m^3/yr per year previously presented should be used in the design of the proposed conveyance and storage systems” while acknowledging the value “could be closer to 1,300,000 m^3.”	e) Clarification of the target withdrawal limit for Lake Qikiqtalik	The three values cited serve different purposes. The value of 1,681,676 m^3/yr is the median (50th percentile) of the modelled annual outflow distribution (Attachment 34 Table 8-3). It is a hydrologic statistic describing lake yield, not a proposed withdrawal amount. The value of 1,284,184 m^3/yr is the mode of the right-skewed lognormal outflow distribution and is Tetra Tech's recommended planning-level estimate of the volume sustainably available for withdrawal in a hydrologically average year. The mode was adopted in place of the median as a more conservative planning value given the skew of the distribution (Attachment 34 Executive Summary, Table 8-3, Section 9.0). The value of 1,100,000 m^3/yr is the engineering design basis for the proposed conveyance and storage infrastructure, retained from the Issued-for-Review submission to provide additional conservatism in system sizing (Attachment 34 Section 9.0). The City is seeking a licensed withdrawal limit from Lake Qikiqtalik of up to 1,300,000 m^3 per year. This is consistent with the approximately 1,300,000 m^3/yr average-year availability applied in the combined Apex River and Qikiqtalik Lake supply scenarios (Attachment 37Sections 3.2, 6.0 and 7.0) and brackets the 1,284,184 m^3 mode. System sizing will be confirmed at detailed design. Original sizing by Tetra Tech assigned a design volume of 1,100,000 m^3/yr for conveyance and storage infrastructure, however. Tetra Tech has conveyed to the City that designing instead for 1,300,000 m^3/yr to align with the licensing request is appropriate. Setting the licence limit at 1,300,000 m^3/yr provides headroom to withdraw the additional volume available in average and wetter years, and avoids the need for a future licence amendment. Actual annual withdrawals would remain below availability in dry years through adaptive management; both reports recommend continued monitoring of lake levels and outflow to guide the City's withdrawal decisions each year (Attachment 34 Executive Summary, Sections 2.1 and 9.0). The reported availability is the total physical volume available for withdrawal, prior to any allowance for baseflows that may be required to support downstream fish habitat. The City proposes to confirm any such environmental flow requirement with regulators through the licensing process and the formalized outlet (weir) monitoring program (Attachment 34 Section 9.0).	

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TABLE 1

CITY OF IQALUIT
CITY OF IQALUIT MUNICIPAL WATER LICENCE

CITY OF IQALUIT WATER LICENCE AMENDMENT AND RENEWAL
RESPONSE TO TECHNICAL REVIEW COMMENTS FROM CANADA-INDIGENOUS RELATIONS AND NORTHERN AFFAIRS CANADA

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Technical Comment No.	Subject	Reference	Comment	Recommendation	City of Iqaluit Response	Attachment
CIRNAC-TR-09	Studies and Designs: Site Specific Data and Analysis to Support the Design and Management Decisions - Climate Projection Horizons	Attachment 32	The project is expected to operate until 2128; however, the climate projections and risk assessment go up to the 2080s (2071–2100). The assessment does not clearly demonstrate that climate impacts have been evaluated over the full design life of the infrastructure.	(TR-09) CIRNAC recommends that the City of Iqaluit extend the temporal scope of the climate projections and Climate Lens Assessment to align with the anticipated operational life of the project (i.e., to 2128), or provide clear justification demonstrating that the current projection horizon (2071–2100) is sufficient to characterize climate-related risks over the full design life of the infrastructure.	The City suggests that given the uncertainty in both climate change and in the models as far out as 2128, that the current work is adequate.	
CIRNAC-TR-10	Annual Report Template - Water Quality Monitoring Data	Water Licence 3AM-IQA1626	As part of the Completeness Assessment submitted to the City of Iqaluit on February 6, 2026, CIRNAC recommended that the City provide a revised Annual Report template that includes (i) a comparison of water quality data to predictions/standards for the annual reports and (ii) a section relevant to the NIRB screening within their annual report template (Comment 2026-02-06-IR#09). In the City of Iqaluit's Table 1 – City of Iqaluit Water Licence Renewal/Amendment Application Response to Initial Information Requests document, the City responded to (i) that such a comparison was not possible as no predictions had been provided. However, in the current application, the effects of the Project on water quality are characterized as negative and mitigable. This indicates that an effect prediction has been made, but the basis, magnitude, and parameters of this prediction are not defined. Clearly articulated predictions of impacts to water quality (e.g., expected changes in parameters, magnitude, spatial extent, and duration) should be made to establish a framework for comparing future monitoring results or to evaluate whether mitigation measures are effective. In the City of Iqaluit's Table 1 – City of Iqaluit Water Licence Renewal/Amendment Application Response to Initial Information Requests document, the City responded to (ii) with a summary regarding the 2014 NIRB screening decision report. CIRNAC's Comment 2026-02-06-IR#09 was to provide a revised Annual Report template that includes a section relevant to the NIRB screening. The City's response does not address the request.	(TR-10) CIRNAC recommends that the City of Iqaluit provide a revised Annual Report template that includes a comparison of water quality data to predictions/standards for the annual reports and a section relevant to the NIRB screening.	The City will not be submitting a comparison of water quality data to predictions (which don't exist) or standards (which are public health related, and outside the jurisdiction of the Board). Reporting on compliance with NIRB screening terms and conditions is not a requirement of the current licence and as a result the City does not believe the comparison and NIRB compliance reports are required.	
CIRNAC-TR-11	Compliance Assessment - Potable Water and Sewage Lagoon	Attachment 7 and Application Main Document	Part E item 1 of the Compliance Assessment states that "the licen*see is authorized to use the Sewage Lagoon Facility and the Wastewater Treatment Plant to treat and dispose of Wastewater Generated by the undertaking authorized under this Licence until such time that the Upgraded Wastewater Treatment Plant authorized by the Licensee is constructed and commissioned, or as otherwise approved by the Board in writing.*" The Application indicates that the upgraded wastewater treatment plant has been constructed and commissioned; however, the sewage lagoon continues to be used for management of certain waste streams, including industrial (brewery) waste and WWTP sludge. Table 2.2, item H of the Application main document indicates that the City is not requesting any changes to the Licence for the sewage lagoon. As presented, the Application does not clearly reconcile current lagoon use with existing licence wording.	(TR-11) CIRNAC recommends that the City of Iqaluit provide the following: a) Confirmation of the current and intended future role of the Sewage Lagoon, including whether it is to remain in operation (e.g., for industrial waste, sludge management, and/or contingency storage for the WWTP) b) Request for amendments to the Water Licence, as required, to ensure that licence conditions accurately reflect current and proposed operations of the Sewage Lagoon	The sewage lagoon will continue to be used to store untreated sewage and sewage sludge during periods of upset conditions or when repairs are required in the WWTP. The following is what is being requested as a new clause in Part E of the new licence to account for this change: *The Licensee is authorized to use the Sewage Lagoon Facility to treat and dispose of Wastewater including sewage sludge when upset conditions occur in the Wastewater Treatment Plant, or when the Wastewater Treatment Plant is offline for repair, or as otherwise approved by the Board in writing.*	
CIRNAC-TR-12	Seasonal Water Quality	Application Main Document, Attachment 36	The reference document includes water quality sampling from a single sampling event (July 2024) for Lake Qikiqtalik rather than for each season and each source water.	(TR-12) CIRNAC recommends that the City provide sampling results for relevant water quality parameters from each season and source water.	The water quality testing completed to date was adequate for the City to establish its suitability as a water supply source, and the City is not planning to conduct further sampling.	
CIRNAC-TR-13	Construction Monitoring	Attachment 31	The Erosion and Sediment Control Plan identifies that inspections will be carried out by an Environmental Monitor; however, it does not establish quantitative monitoring parameters or define thresholds that would trigger corrective actions or remediation.	(TR-13) CIRNAC recommends that the City of Iqaluit provide the following: a) Identification of specific monitoring parameters (e.g., turbidity, total suspended solids) for construction activities	The following parameters and maximum concentration of any grab samples have been deemed applicable to surface runoff from the construction area and any quarries and borrow pits: pH: between 6 and 9 TSS: 30 mg/L Ammonia (NH3-N): 4.0 mg/L These parameters and thresholds will be incorporated into the construction phase water management and monitoring plan referenced above. Regarding TSS monitoring, since TSS is determined by laboratory gravimetric analysis and is not available in real time, turbidity may be used as a surrogate monitoring parameter for active construction stormwater management. This is typically accomplished by collecting paired turbidity measurements and laboratory TSS samples during representative discharge events, developing a site-specific correlation between turbidity and TSS, and then using the corresponding turbidity value as an operational trigger to demonstrate or maintain compliance with the applicable TSS-based effluent limit. This approach may be utilized during construction of the LTWP. The City proposes to file the TSS-turbidity correlation testing with the Board at the onset of monitoring.	
				b) Definition of baseline conditions and established quantitative thresholds and/or duration criteria that would trigger corrective actions or remediation	The City does not envision the need to establish baseline conditions for the parameters proposed for monitoring surface runoff from construction areas. The proposed discharge limits have been adopted by the Board in other Type A water licences.	
				c) Clear description of the scope and frequency of routine monitoring to ensure consistent implementation during construction	Monitoring frequency for construction stormwater discharges is typically structured around qualifying precipitation and discharge events rather than a fixed calendar-based schedule. Monitoring is proposed during periods of flow/discharge. When sampling sumps or other containment, sampling will be undertaken prior to discharge.	
CIRNAC-TR-14	Operation and Maintenance Plans for Water Works	Application Main Document Section 8, Table 8.1	Table 8.1 identifies the existing plans and operation and maintenance manuals required under the current licence. It does not include an operation and maintenance plan for the Water Treatment Facility, as required under the current Licence (Part D, item 2), or details for the Lake Geraldine Dam/Intake. The Application did not include an operation and maintenance plan for the existing or proposed water works.	(TR-14) CIRNAC recommends that the City of Iqaluit provide an operation and maintenance plan for the Water Treatment Facility and Lake Geraldine Intake.	An O&M Manual for the existing water treatment plant was presented as Attachment 11 of the Application. The LTWP facilities are currently undergoing detailed engineering design. The City proposes that a condition of the new licence include a requirement for an O&M Manual for the new LTWP components, once constructed. This could be an update to the Water Treatment Plant O&M Manual or a stand-alone manual for the new components of the water supply system.	

TABLE 1

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Technical Comment No.	Subject	Reference	Comment	Recommendation	City of Iqaluit Response	Attachment
CIRNAC-TR-15	Temporary Storage of Waste Materials during Construction of the LTWP	City of Iqaluit Type A Water Licence Amendment and Renewal Application	Table 4.1 in the Application lists the types, projected amounts, and methods of disposal during LTWP construction. As an example, wood is to be disposed of at the City's landfill. It is not clear whether there are temporary measures for storing such waste at the construction site prior to final disposal (i.e., waste bins, stockpiles, etc.).	(TR-15) CIRNAC recommends that the City of Iqaluit clarify the temporary measures for storing such waste at the construction site prior to final disposal.	The City does not intend to establish temporary waste disposal sites during construction of the LTWP. The contractors will be required to dispose of waste in the City's landfill as it is generated.	
CIRNAC-TR-16	Wastewater System Capacity	Application Main Document, Table 1 IR Responses, Attachment 44	The Application refers to the WWTP Redesign Report (2017), which indicates that the facility has been designed to process up to 151 L/s (13,046 m³/d), corresponding to the forecasted peak hour flow for 2041. The same report identifies an average day demand in 2041 as 4,328 m³/d (50.3 L/s) and maximum day demand of 8,696 m³/d (60.4 L/s). Wastewater treatment facilities are generally designed to convey peak hourly flows through hydraulic components without surcharge, treatment processes are generally sized based on average and maximum daily conditions, with peak flows assumed to occur over short durations and managed through storage and process resilience. Sustained operation at peak hourly flow rates may result in reduced treatment performance and effluent quality.	(TR-16) CIRNAC recommends that the City of Iqaluit provide the following: a) Clarification of the basis for the reported WWTP capacity, including whether it reflects peak hourly flow, maximum day flow, or average day flow	Design flows are presented in Table 2 of the 2017 WWTP Redesign Report (Attachment 44). This includes the peak hourly flow (151 L/s), the maximum daily flow (8,696 m3/d), and the average annual flow (or average day flow) of 4,348 m3/d. CIRNAC cited the maximum day demand, but it is the maximum daily flow. The text in Section 4.1.1 of the Application is only a plain language summary, and doesn't fully reflect the technical contents of the redesign report.	
			As presented, the Application does not clearly distinguish between hydraulic conveyance capacity and effective treatment capacity, nor does it identify the flow rate at which the facility is expected to reliably meet effluent quality objectives under long-term operating conditions.	b) Identification of the flow rate at which the treatment processes are designed to consistently achieve effluent quality requirements over sustained operating conditions	The treatment process sizing basis is lower, with an average annual flow of 4,348 m³/d (50.3 L/s) and a maximum month/day design flow of approximately 5,218 to 8,696 m³/d, with individual process units sized accordingly (e.g., MBBR to maximum month conditions and hydraulic components to peak hour flow).	
			As presented, the Application does not clearly distinguish between hydraulic conveyance capacity and effective treatment capacity, nor does it identify the flow rate at which the facility is expected to reliably meet effluent quality objectives under long-term operating conditions.	c) Update on the reported treatment capacity in the Application, as required, to distinguish between hydraulic conveyance capacity and effective treatment capacity	The hydraulic conveyance capacity is equal to the peak hour flow of 151 L/s. The effective treatment capacity is provided in the response to part (b). Please refer to Attachment 44 for definitive design information on the WWTP.	
CIRNAC-TR-17	Spill Contingency and Emergency Response Plans	Attachments 18, 30, 47, 51, 56, 57	Emergency response and spill contingency procedures are provided across multiple documents submitted with the City of Iqaluit Type A Water Licence Amendment and Renewal Application. Some documents are specific to investigative work (e.g., Attachment 18), whereas others apply to construction, or current or future site operations (e.g., Attachments 47, 51, 56 and 57). Where multiple documents address similar topics, including spill response, minor discrepancies among these documents introduce uncertainty for personnel, contractors, and other parties responsible for emergency response.	(TR-17) CIRNAC recommends that the City of Iqaluit provide the following: a) Provide a single, consolidated Emergency Response and Spill Contingency Plan applicable to all activities and facilities under the Water Licence, or clearly specify within each document which plan governs in the event of overlap to ensure consistency and avoid conflicting direction.	The City suggests that it is appropriate to have longer-term emergency response and spill contingency plans separate from those focused on construction of the LTWP, as the latter will need to contain site-specific and temporary information such as spill kit contents and locations, emergency contacts, etc.).	
			Attachment 56 - Spill Contingency Plan, Revision 1, dated April 24, 2026, appears to be the primary plan for spill response. Review of this document identified that the Safety Data Sheets (SDSs) included in Appendix D of this Plan reference additional chemicals (e.g., propylene glycol antifreeze and engine coolant, hydrofluorosilicic acid, sodium hypochlorite, and proprietary water treatment chemicals) that are not addressed within the body of the plan. In addition, while the plan addresses sewage spills associated with facilities such as lift stations and lagoons, it does not address potential spills from the sewage force main, which fully buried and is not actively monitored.	b) Update Attachment 56 - Spill Contingency Plan to include within the body of the plan all chemicals identified in the SDSs, including applicable handling, response, and contingency measures	It is not a requirement to have chemical-specific response plans for each and every SDS contained in a Spill Contingency Plan. The City used CIRNAC's 2007 guidance (Guidelines for Spill Contingency Planning, prepared by Water Resources Division, Indian and Northern Affairs Canada, April 2007). Applicable handling requirements are provided in the SDS.	
				c) Expand the plan to address potential sewage spills from the sewage force main, including appropriate detection, response, and contingency measures given the absence of active monitoring.	The City has provided detailed response procedures for sewage spills from force mains and the lagoon because these are the most likely scenarios based on the City's experiences to date. Establishing detection, response, and contingency measures for a spill from the buried sewage force main is not a requirement.	
CIRNAC-TR-18	Proposed Modification to the Scope of the Current Water Licence - Wastewater Effluent Sampling Requirements	Application Main Document	Table 2.2 of the Application indicates that no changes are requested to monitoring requirements under the current licence. However, the existing wastewater effluent monitoring program requires monthly analysis of a broad suite of parameters, including a full ICP metals scan. While comprehensive, this approach is more consistent with detailed characterization programs than long-term operational monitoring. Under a CCME-based framework, sampling programs are intended to provide data that is directly relevant to ecological risk characterization. Once key constituents of potential concern have been identified, ongoing monitoring programs should be refined to focus on those parameters that are demonstrably linked to treatment performance and environmental risk.	(TR-18) CIRNAC recommends that the City of Iqaluit provide the following: a) A review of wastewater effluent monitoring requirements, including sampling frequency and analytical parameters, to align with a risk-based monitoring approach and practices applied to comparable municipal systems in Nunavut and elsewhere in Canada	Section 2.1 of the 2017 WWTP Redesign Report provides a history of previous discussions between the City, the NWB, and Environment and Climate Change Canada, and proposed design criteria are presented in Table 1 of the design report. The proposed design criteria (20 mg/L BOD and 20 mg/L TSS) are slighlty more stringent than the CCME's National Performance Standards (25 mg/L and 25 mg/L, respectively). Unfortunately, the redesigned WWTP, commissioned in 2020, has not consistently met the discharge limits adopted as design criteria. As shown in Table 3 of Appendix A of the 2025 Annual Report, the design criteria for BOD of 20 mg/L was met during only three of 12 monthly sampling events, and the discharge criteria for TSS of 20 mg/L was met in only four of 12 events. The City experiences challenges with equipment breakdowns, high staff turnover, and limited funding.	
			For the parameters currently required under the Effluent (E), Nutrients (N), and Biological (B) groups, continued routine monitoring at the current frequency is generally appropriate, as these parameters are known to vary over time and are directly relevant to effluent quality and potential effects on the receiving environment. For systems with predominantly domestic inputs, metals concentrations are typically stable, and frequent full-suite metals analysis may not be necessary to support compliance or risk-based environmental protection. As such, the current program does not clearly reflect a risk-based monitoring approach aligned with comparable municipal systems.	b) Where changes are warranted based on the review, request corresponding amendments to the Water Licence	There are no comparable municipal systems in Nunavut. The four most recent Type A Water Licence renewals (Chesterfield Inlet, Arviat, Coral Harbour, and Igloolik) all have low tech lagoon systems that discharge overland through tunda or wetland to the ocean. This approach is not an option based on the City's population, footprint and geography. Hence, the City operates the only mechanical wastewater treatment plant in the territory. There are few directly comparable northern systems, with examples including Fort Simpson, Inuvik, and Yellowknife in the NWT, but that Iqaluit has a unique combination of scale, marine discharge, tidal receiving environment, remoteness, and operational history.	
			Under the current water licence, the wastewater treatment plant and sewage lagoon do not have wastewater effluent discharge requirements. This makes it difficult for the City to evaluate the treatment performance of each facility and to report effluent compliance.	c) Identify effluent discharge quality requirements for monitoring treatment performance and effluent compliance	The City suggests that its focus should be on optimizing the current WWTP to meet the designed effluent criteria as much of the time as possible, recognizing the challenges described above. The goal is to consistently meet the design criteria concentrations for BOD and TSS, without assigning discharge criteria in the new licence that the City may find itself out of compliance on.	
CIRNAC-TR-19	Monitoring Plans	Attachment 45, 47, 50, 51, 58, 59	Monitoring requirements are described across multiple documents submitted with the City of Iqaluit Type A Water Licence Amendment and Renewal Application; however, these requirements are not consistently presented. Variations in sampling frequency, analytical parameters, and field methods are noted among documents and, in some cases, within the same document. For example, Attachment 45 - Sewage Lagoon O&M Manual states that sewage lagoon effluent is to be sampled during periods of low flow, while elsewhere in the document it specifies monthly sampling during periods of active flow. This differs from the current Water Licence, which requires sampling once prior to discharge, once during discharge, and once prior to completion of discharge. Attachment 58 - Environmental Monitoring Program and Quality Assurance/Quality Control (QA/QC) Plan, Revision 4 (April 24, 2026) appears to be the primary monitoring plan; however, several updates and considerations are not reflected: • Consideration of low-flow groundwater monitoring methods, which are recommended in the Landfill Facility Monitoring Plan (Attachment 59) but not incorporated into Attachment 58 • Field procedures to minimize sediment disturbance during surface water sampling • Inclusion of equipment blanks, in addition to trip and field blanks. • Explicit alignment of field procedures with recognized industry guidance (e.g., the Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment by the CCME, 2016). • Updating references to Canadian Environmental Quality Guidelines, noting that CCME guidelines are no longer maintained as a single consolidated document In addition, baseline investigations completed by Dillon in 2019 at the proposed Water Treatment System (WTS) and North 40 Landfill identified exceedances for petroleum hydrocarbons (PHCs), polycyclic aromatic hydrocarbons (PAHs), and dissolved metals in soil and groundwater. Where such exceedances occur at locations subject to ongoing monitoring under the Water Licence, the Application does not identify whether follow-up investigation or remediation is required. Further, it is noted that leachate monitoring at the North 40 Landfill is expected to include frequent initial sampling (e.g., weekly sampling, followed by monthly sampling if conditions stabilize), as well as seepage and soil sampling based on landfill performance, these components are not reflected in the current Water Licence requirements or proposed changes to the surveillance network program.	(TR-19) CIRNAC recommends that the City of Iqaluit provide the following: a) A single, consolidated Monitoring Plan applicable to all facilities and activities under the Water Licence. Alternatively, clearly identify within each document which plan governs in the event of overlap to ensure consistency and avoid conflicting requirements. If Attachment 58 is intended to serve as the consolidated plan, it should be updated to address the considerations outlined above. b) Confirm that monitoring at the WTS and North 40 Landfill will be initiated in advance of commissioning to further characterize and assess previously identified soil and groundwater impacts. Where exceedances are identified at monitored stations, provide a framework for follow-up investigation and/or remediation, as applicable.	Re: Attachment 45 - Sewage Lagoon O&M Manual: The discrepancies between the licence and the manual have been corrected in an updated manual provided as Attachment F. Regarding a single consolidated monitoring plan, the Environmental Monitoring and QA/QC Plan is this plan (Attachment G). The recommendation for low-flow sampling is intended to minimize disturbance and obtain representative groundwater samples. In Iqaluit's shallow active-layer wells, which contain very small standing water volumes, those objectives can be met by controlled low-volume Waterra sampling. Given the limited saturated thickness, small well volume, and operational realities of remote Arctic monitoring, Waterra tubing with foot valve is a simple, practical, and technically defensible method for routine sampling.	Attachment F - Sewage Lagoon O&M Manual Attachment G - Environmental Monitoring Program and QA/QC Plan

TABLE 1

CITY OF IQALUIT
CITY OF IQALUIT MUNICIPAL WATER LICENCE

CITY OF IQALUIT WATER LICENCE AMENDMENT AND RENEWAL
RESPONSE TO TECHNICAL REVIEW COMMENTS FROM CANADA-INDIGENOUS RELATIONS AND NORTHERN AFFAIRS CANADA

Print Jul-22-26 17:39:10

Technical Comment No.	Subject	Reference	Comment	Recommendation	City of Iqaluit Response	Attachment
CIRNAC-TR-20	Environmental Investigation Requirements	Attachment 18, 29, 38	In addition to developing a monitoring plan, investigative activities undertaken in advance of construction should be presented in a consistent and integrated manner across all project documents. Methodologies, material handling practices, and mitigation measures described in supporting reports should be aligned to ensure a coherent and environmentally protective approach.	(TR-20) CIRNAC recommends that the City of Iqaluit provide the following; a) A single, consolidated plan or framework for investigative work that clearly defines methodologies, material handling procedures, mitigation measures, and applicable comparison criteria.	All environmental monitoring will be conducted in accordance with the methodologies outlined in the Environmental Monitoring Program and QA/QC Plan. This Plan also outlines operational monitoring as required by the water licence. A construction phase water management and monitoring plan for the LTWP is under development that will describe where water is likely to be discharged and the associated monitoring. The EPP will be updated by the Contractor and will be submitted to the Board with the IFC drawings for the LTWP. This will be the centralized environmental protection and mitigation plan.	
			Discrepancies are noted between documents. For example, Attachment 18 - LTWP Detailed Design Report - Appendix C - Geotechnical Workplan indicates that drilling spoils will be used as borehole backfill or discharged locally. In contrast, Attachment 29 - LTWP Detailed Design Report - Appendix M - Environmental Protection Plan requires drill cuttings, fluids, and sludge to be contained, reused, or disposed of off-site to prevent their entry into any water body. These approaches are not consistent and should be reconciled.	b) Alternatively, where multiple documents are maintained, clearly identify which document governs in the event of overlap to ensure consistency and avoid conflicting requirements.	The EPP will be the governing document during construction of the LTWP, and the geotechnical work plan will not be carried forward into construction.	
				c) Demonstrate that all environmental analytical results from investigative programs have been and will be evaluated against applicable regulatory or guideline criteria to support conclusions regarding environmental risk.	Applicable compliance criteria will be outlined in the new water licence.	
			Further, where environmental samples are collected as part of investigative work, analytical results should be evaluated against applicable regulatory or guideline criteria to support conclusions. For example, Attachment 38 - LTWP Geotechnical Report presents groundwater chemistry results and concludes that concentrations are “of no concern”; however, it is not clear whether these results were compared to applicable criteria to support this conclusion.	d) Clearly describe how investigative field activities will transition to construction activities, including identification of applicable mitigation measures (e.g., handling and disposal of drilling spoils, fluids, and potentially contaminated materials) to ensure consistency between investigative and construction-phase environmental management.	The EPP will the governing document during construction of the LTWP, and the geotechnical work plan will not be carried forward into construction.	

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REV	DATE	DESCRIPTION	PREP'D	RVW'D
0	21JUL'26	ISSUED WITH TRANSMITTAL NB26-00865	RAC	AMH

TABLE 2

CITY OF IQALUIT
CITY OF IQALUIT MUNICIPAL WATER LICENCE

CITY OF IQALUIT WATER LICENCE AMENDMENT AND RENEWAL
RESPONSE TO TECHNICAL REVIEW COMMENTS FROM THE GOVERNMENT OF NUNAVUT

Print Jul-22-26 17:39:10

Technical Comment No.	Subject	Reference	Comment	Recommendation	City of Iqaluit Response	Attachment
GN-TR-01	Water Parameter Monitoring and Testing	• Application • 2025 Annual Water Licence Report • LTWP Preliminary Design Report – Appendix M – Environmental Management Plan	The Government of Nunavut (GN) has concerns and is seeking additional information regarding the City of Iqaluit's (Proponent) proposed water quality parameter monitoring. Water parameter testing is a necessary component of environmental management and is integral to determining project performance, impacts, and mitigation effectiveness. The Proponent's 2025 annual report states "certain required parameters were not analyzed during the reporting period". The report stated that these parameters were not tested as the Proponent lacked the required laboratory equipment and that staff were not fully aware of the required testing parameters. The report states: "The City has procured the necessary laboratory equipment required to support testing of the parameters associated with the monitoring stations, and this testing will be undertaken in 2026. In addition, the City's third-party laboratory has been advised of the parameters that were previously omitted from testing, and these will be included in the monitoring program moving forward. The missing field parameters were primarily the result of current City staff not being fully aware of all required testing parameters at the time of sampling. To address this, ongoing efforts have been undertaken to familiarize operational staff with the applicable monitoring requirements and sampling procedure (including QA/QC)."	The GN recommends the Proponent: • Provide a list of the laboratory equipment that has been acquired for the purposes of conducting water quality testing.	The laboratory equipment includes test kits to analyze for field parameters as specified in Schedule I of the Licence. These are identified in Table 1 of the Environmental Monitoring Program and QA/QC Plan, included as Appendix G of this response.	Attachment G - Environmental Monitoring and QA/QC Plan
			The Proponent has included with their water license proposal an environmental management plan. Section 3.4 of the management plan includes a list of the information that will be collected during analysis. The name of the person(s) who performed the sampling or took the measurements including any relevant accreditations. • The date, time, and place of sampling or measurement, and weather conditions. • The date of analysis. • The name of the person(s) who performed the analysis including any relevant accreditations. • A description of the analytical methods or techniques used, and • A discussion of the results of any analysis. The management plan does not state the steps of the testing, what quality parameters will be analyzed or the equipment that will be utilized in this testing. This information is necessary to assess the efficacy of the management plan and if the issues of testing identified in the Proponent's 2025 annual report have been addressed.	• Provide and include in their management plan, a copy of the training plan for water quality personnel for the sampling, analysis, and reporting that will be used to ensure previously missing parameters will be tested.	The first part of the comment is related to existing facilites, such as the WWTP, Sewage Lagoon, landfills, etc. This monitoring is conducted by City of Iqaluit staff and these staff are identified in Section 4.10 of the Environmental Monitoring and QA/QC Plan (Attachment G). These staff were trained in water sampling as part of their water treatment operator certification. During LTWP construction, the contractor will be responsible for providing trained personnel to conduct monitoring. This will be overseen by the City's engineering consultant in its Owner's Engineer role. The Owner's Engineer will periodically collect additional samples for verification.	Attachment G - Environmental Monitoring and QA/QC Plan
GN-TR-02	Spill Contingency Plan	• Water Licence Part H, Item 1 • Spill Contingency Plan, updated May 2016 • Application materials related to existing facilities, new waste facilities, and LTWP construction	The Government of Nunavut (GN) has concerns regarding the Spill Contingency Plan relied on in the City of Iqaluit's (Proponent) Type A Water Licence renewal/amendment application. The Proponent states that it has been maintaining and using a Spill Contingency Plan approved by the Board in accordance with Part H, Item 1 of the current Water Licence. The referenced Spill Contingency Plan was updated in May 2016 and includes procedures for reporting and responding to spills associated with municipal infrastructure. The application record includes existing municipal facilities, new waste management facilities, and construction activities associated with the City's Long-Term Water Project. The application record does not confirm whether the May 2016 Spill Contingency Plan remains applicable to the full scope of activities and facilities proposed under the renewed/amended licence. This creates uncertainty regarding whether current facilities, contact information, contaminants, existing and proposed contaminant storage, new facilities, and LTWP-related construction activities are fully addressed through current spill prevention, and management procedures. The application record also does not identify how any additional emergency response plans or facility-specific O&M manuals work together with the approved Spill Contingency Plan.	The GN recommends that the Proponent: • Confirm whether the May 2016 Spill Contingency Plan remains applicable to the full scope of the renewed/amended licence, including all existing and new facilities, and construction activities associated with the Proponent's LTWP.	The Spill Contingency Plan presented in the Application as Attachment 56 was updated in April 2026 (not 2016). The intent of this plan is to address operations only. A Spill Contingency Plan specific to LTWP construction will be prepared by the City's contractor. This plan will be submitted to the Board at least 30 days prior to the start of construction.	
				• Confirm that all existing or proposed contaminant storage that meets the applicable requirements under the Spill Contingency Planning and Reporting Regulations is covered by a current spill contingency plan.	The current Spill Contingency Plan includes the relevant SDS for hazardous materials handled by the City.	
				• Confirm that other contaminant storage associated with the undertaking is addressed through appropriate spill prevention, and management.	It is not clear what the GN is asking in this recommendation.	
				• Identify how any additional emergency response plans, facility-specific operations and maintenance manuals, or related plans operate with the approved Spill Contingency Plan.	The City has an established response organization. Section 2 of the Spill Contingency Plan (Attachment 56) outlines the roles and responsibilities of the first responder interacting with the City's response organization, including the City's Dispatch, public works staff, and fire department.	
				• Provide for review any updates or addenda required to reflect current facilities, contact information, contaminants, existing and proposed contaminant storage, and activities proposed under the renewed/amended license.	As noted above, the Spill Contingency Plan presented as Attachment 56 of the Application governs the City's current operations. A separate LTWP Spill Contingency Plan will be developed by the City's contractor prior to construction, focusing solely on the LTWP construction activities.	
GN-TR-03	Watercourse Crossings, Culverts, Drainage Crossings, and Watercourse Training	• Nunavut Waters and Nunavut Surface Rights Tribunal Act, Section 11. • Nunavut Waters Regulations, SOR/2013-69, Schedule 1, Item 3, Municipal undertaking. • Nunavut Waters Regulations, SOR/2013-69, section 3(f)(iii), Section 4, section 7, and Schedule 2, Item 2(1) to 2(3), licensing criteria for watercourse crossings, watercourse training, and alteration of flow of waters. • City of Iqaluit Type A Water Licence Renewal/Amendment Application materials related to the Long-Term Water Project (LTWP), municipal roads and access roads, drainage infrastructure, gravel source or reserve areas, access to new waste management facilities, the Waste Transfer Station, and the New North 40 Landfill. • City of Iqaluit Type A Water Licence Renewal/Amendment Application materials identifying or referring to	The Government of Nunavut (GN) has concerns regarding the identification, authorization status, and supporting information for watercourse crossings, drainage crossings, culverts, watercourse training works, and alterations of flow associated with the City of Iqaluit's (Proponent) Type A Water Licence renewal/amendment application. Section 11 of the Nunavut Waters and Nunavut Surface Rights Tribunal Act prohibits the use of waters in Nunavut except in accordance with the conditions of a water licence, subject to the exceptions set out in the Act, including unlicensed uses of waters authorized by regulation. The Nunavut Waters Regulations identify a municipal undertaking as including a waste disposal or water system for a municipality. The Regulations also identify water uses related to watercourse crossings, watercourse training, and alteration of flow of waters, with different authorization or licensing thresholds depending on the nature and scale of the activity. The Proponent's application identifies municipal infrastructure and activities that may involve crossings, culverts, drainage features, watercourse training, alteration of drainage, or related works associated with the LTWP, access roads, gravel source or reserve areas, access to new waste management facilities, the Waste Transfer Station, and the New North 40 Landfill. The application record does not include a consolidated inventory identifying all Proponent owned, operated, or proposed watercourse crossings, culverts, fords, watercourse training works, or alterations of flow associated with the project. This creates uncertainty regarding which existing or proposed works are included in the renewed/amended licence application, which works may be authorized without a licence under the Regulations, which works may require a Type A or B licence, and whether appropriate conditions or mitigation measures are required to prevent sediment release, erosion, altered drainage, or contaminant transport to surface water. The application record also does not appear to provide complete design drawings, technical specifications, or equivalent supporting information for all existing or proposed crossings and watercourse training works. Without this information, it is difficult to assess whether the works are designed, maintained, and monitored in a manner protective of water quality and drainage function.	The GN recommends that the Proponent: • Provide a consolidated inventory of all Proponent owned, operated, or proposed watercourse crossings, culverts, fords, watercourse training works, and alterations of flow associated with the project.	The LTWP will involve the replacement of the bridge on the Road to Nowhere's crossing of the Apex River with multiple culverts. The City is engaged with Fisheries and Oceans Canada (DFO) regarding this crossing, including mitigation of impacts to fish and fish habitat. The City expects to file Issued for Construction drawings of the new crossing with the Board ahead of construction, as required by the water licence. The City maintains a number of existing watercourse crossings. No changes are proposed to these crossings, and thus no new authorization is being sought as part of the water licence renewal and amendment process. The City has developed a Master Drainage Plan. This plan is not tied to the water licence.	
				• For each identified crossing or watercourse training work, identify the location, the feature affected, whether the work is existing or proposed, including whether the work is proposed to be authorized under the renewed/amended Type A licence, authorized without a licence under the Regulations, or addressed through another Nunavut Water Board (NWB) authorization or licensing process.		
				• Include, where applicable, crossings and drainage works associated with Carney Creek, the Apex River, access to the new waste management and waste transfer/baling facilities, gravel source or reserve areas, LTWP infrastructure, and intermittent streams or drainage features associated with municipal infrastructure.		
				• Provide design drawings and technical specifications for proposed crossings, culverts, drainage crossings, watercourse training works, or alterations of flow.		
				• Where formal design drawings are unavailable for existing works, provide available information sufficient to identify the crossing or training work and support appropriate licence conditions or mitigation measures. This should include, where applicable, crossing type, description of the crossing, engineering parameters, or other events that may affect water quality.		
				• Where appropriate, ensure inspection, maintenance, and drainage management measures are informed by a recognized northern community drainage standard or guideline, such as CSA S503, or an equivalent standard acceptable to the NWB.		

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TABLE 2

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CITY OF IQALUIT WATER LICENCE AMENDMENT AND RENEWAL
RESPONSE TO TECHNICAL REVIEW COMMENTS FROM THE GOVERNMENT OF NUNAVUT

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Technical Comment No.	Subject	Reference	Comment	Recommendation	City of Iqaluit Response	Attachment
GN-TR-04 Part a	Waste Discharges, Effluent Criteria, and Receiving Environments	• Nunavut Waters and Nunavut Surface Rights Tribunal Act, Section 12. • Nunavut Waters Regulations, sections 5 and 8; Schedule 1, Item 3, Municipal undertaking; Schedule 3, Item 3, deposits of waste for a municipal undertaking. • Water Licence No. 3AM-IQA1626, Part E, Waste Disposal; Schedule I, Monitoring Program	The Government of Nunavut (GN) has concerns regarding the waste-deposit authorizations being sought for the City of Iqaluit's (Proponent) Type A Water Licence renewal/amendment application. Section 12 of the Nunavut Waters and Nunavut Surface Rights Tribunal Act applies to the deposit of waste in waters in Nunavut, or in any other place in Nunavut under conditions where the waste, or waste resulting from that deposit, may enter waters in Nunavut. The Nunavut Waters Regulations classify municipal undertakings and identify authorization thresholds for deposits of waste. The application includes several major municipal facilities that discharge, may discharge, or may require future or contingency discharge of wastewater, leachate, contact water, runoff, or other waste streams. These include the Wastewater Treatment Plant, the Sewage Lagoon Facility, the West 40 Landfill, the New North 40 Landfill, and the Waste Transfer Station. The application materials are spread across multiple plans and manuals. As a result, the application record does not clearly consolidate the waste-deposit authorization being sought for each major facility and waste stream. This creates uncertainty regarding which discharges are proposed to be authorized under the renewed/amended licence, which would be conditional or contingency-based, which would require a future Nunavut Water Board (NWB) approval process, and which waste streams would be managed without discharge to the environment.	The GN recommends that the Proponent: • Provide a facility-by-facility table or equivalent summary for the Wastewater Treatment Plant, Sewage Lagoon Facility, West 40 Landfill, New North 40 Landfill, and Waste Transfer Station. • For each facility, identify each waste stream or effluent source, including all discharge criteria, management, and parameters. State whether discharge authorization is being sought under the renewed/amended licence or through a future NWB process.	The City of Iqaluit is seeking to renew its water licence for existing facilities (Lake Geraldine Reservoir and Water Treatment Plant, wastewater treatment plant, sewage lagoon, West 40 and North 40 landfills, waste transfer station). The City of Iqaluit is assuming by default that the terms and conditions of the current licence for each of these facilities will be carried forward, unless the Board deems changes to be necessary. Part E, Item 4 of the current licence specifies discharge limits for surface drainage or surface water runoff. The current licence does not specify discharge limits for sewage or landfill leachate. The City believes the Application is clear. The various O&M manuals and other plans presented in the Application are those prescribed by the current water licence. Each manual/plan appropriately describes the monitoring programs associated with the respective facility as per Schedule I of the water licence. The stations associated with the Surveillance Network Program are also listed in Table 6.1 of the Application.	
GN-TR-04 Part b		• Attachment 45, Sewage Lagoon O&M Manual	For the Wastewater Treatment Plant and Sewage Lagoon Facility, the application record does not clearly consolidate the authorization basis for discharge, discharge points, discharge pathways to Koojesse Inlet, discharge circumstances, monitoring requirements, notification requirements, discharge volumes, applicable existing licence requirements, and any proposed discharge criteria or objectives for the NWB's consideration.		The management plans appended to the Application appropriately reflect the terms and conditions of the current water licence, including discharge points and pathways, discharge circumstances, monitoring and notification requirements, etc. The City of Iqaluit is not proposing any new discharge criteria or objectives.	
GN-TR-04 Part c		• Attachment 47, West 40 Landfill O&M Manual • Attachment 48, West 40 Landfill Decommissioning Technical Memorandum	For the West 40 Landfill, the application includes decommissioning-related materials, while the West 40 operations and maintenance manual describes continued management of contact water, leachate, runoff, internal pond transfers, and retention pond discharge to Koojesse Inlet. The application record does not describe how these waste streams and discharges will be authorized, and managed.	• For the West 40 Landfill, clarify how the existing leachate and retention pond system will be addressed during closure and post-closure care.	It is not clear what the GN is asking for when it states, "The application record does not describe how these waste streams and discharges will be authorized, and managed." The current licence outlines this, and the contents of the West 40 Landfill O&M Manual are consistent with the terms and conditions of the licence. The future of the leachate collection and retention system will be determined as part of the future Final Closure and Reclamation Plan for the West 40 Landfill that is required under Part J, Item 2 of the current licence. The City has suggested that it will be appropriate to carry forward this condition in the new licence.	
GN-TR-04 Part d		• Attachment 52, North 40 Landfill Leachate Collection and Characterization Plan.	For the New North 40 Landfill, the application materials describe collection, containment, and characterization of leachate, while also discussing possible future or contingency discharge pathways. The application record does not clearly identify whether authorization is being sought at this time for routine, intermittent, emergency, or contingency leachate discharge, or whether future discharge would require a further NWB process. The application also does not clearly distinguish proposed design objectives, treatment targets, or screening values from discharge criteria that may be proposed for the NWB's consideration.		Amendment No. 5 of the Water Licence authorized the North 40 Landfill and Waste Transfer Station. Part E of that amendment outlines the requirements to characterize and manage the leachate. It allows the City to implement its Leachate Characterization and Management Plan (submitted in 2023) in the first two years of operation, and allows the City to submit the leachate characterization results and implement a leachate treatment system, subject to Board approval. If no onsite treatment approach is employed, the leachate will be disposed of at the Wastewater Treatment Plant.	
GN-TR-04 Part e		• Attachment 59, Facility Monitoring Plan - Landfill and Waste Transfer Station	For the Waste Transfer Station, the application record does not clearly identify whether runoff, seepage, wash water, contact water, snowmelt, or other waste streams are proposed to be discharged to the environment, or how those waste streams would otherwise be collected, contained, treated, transported, or managed.	• For the Waste Transfer Station, clarify whether runoff, and waste water are proposed for discharge. Where discharge is not proposed, describe how these waste streams will be collected, and managed.	Leachate management at the Waste Transfer Station is described in Sction 12.1 of the North 40 Landfill and Waste Transfer Station O&M Manual (Attachment 51 of the Application). Leachate generated from baling of waste at the WTS will be collected in a holding tank that will be pumped out and brought to the WWTP for disposal.	

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0	21JUL'26	ISSUED WITH TRANSMITTAL NB26-00865	RAC	AMH

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TABLE 3

CITY OF IQALUIT
CITY OF IQALUIT MUNICIPAL WATER LICENCE

CITY OF IQALUIT WATER LICENCE AMENDMENT AND RENEWAL
RESPONSE TO TECHNICAL REVIEW COMMENTS FROM FISHERIES AND OCEANS CANADA

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Technical Comment No.	Subject	Reference	Comment	Recommendation	City of Iqaluit Response	Attachment
DFO-TR-01	Use of Explosives (NWB-DFO-02)		As part of their response to DFO's first round of Information Requests, the City of Iqaluit committed to limiting water overpressures to 50 kPa at the location of a live fish, consistent with DFO guidance. DFO recommends modelling to demonstrate blasting thresholds are met as well as proposed mitigation measures (e.g., timing windows, use of blast mats, isolation) and any monitoring plans to verify that impacts are avoided or minimized.	DFO recommends those requests be included in the project's Preliminary Blast Assessment, however, any issues that cannot be fully resolved through the Board's process can continue to be addressed through DFO's regulatory review.	The agreed upon 50 kPa overpressure limit will be integrated into the detailed design. The City will continue to engage the DFO regarding any proposed blasting in close proximity to fish-bearing waters.	
DFO-TR-02	Water Withdrawal from the Apex River		The City of Iqaluit proposes to withdraw from the Apex River less than 10% of instantaneous discharge when flow is between 0.143 m^3/s and 0.156 m^3/s (between 30% and 33% of the Mean Annual Discharge (MAD)), or up to 20% instantaneous discharge when flow exceeds 0.156 m^3/s (>33% MAD). Although DFO's Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada indicates that cumulative flow alterations of less than 10% of the instantaneous flow relative to the natural flow regime are generally associated with a low probability of detectable impacts to fisheries-supporting ecosystems, the proposed pumping protocol would exceed this screening threshold during periods when Apex River discharge exceeds 0.156 m^3/s (>33% MAD), allowing withdrawals of up to 20% of the instantaneous discharge. The Apex River provides important spawning, migration, and residence habitat for Arctic Char; therefore, reductions in available flow may affect fish and fish habitat through mechanisms such as habitat loss or reduced fish passage. Stantec's 2023 Analysis of Fisheries and Hydrologic Information of Apex River (Attachment 33) concluded that the proposed pumping protocol is unlikely to result in adverse effects on fish and fish habitat in the Apex River. This assessment was determined through hydraulic and habitat modelling informed by baseline field surveys. DFO notes that uncertainty remains regarding the accuracy of the modelling results, as no field monitoring was conducted during pumping operations to verify model predictions under withdrawal conditions. In addition, the proposal does not include a monitoring program to verify the predicted effects of water withdrawals on fish and fish habitat, nor does it identify contingency measures should monitoring indicate adverse effects.	DFO recommends that the proponent: • Implement field monitoring during withdrawal periods to demonstrate that thresholds are not exceeded, confirm hydraulic conditions are as expected, and identify adverse effects to fish or fish habitat (e.g., fish stranding, barriers to migration, reduction of wetted area).	The City extracted between 18% and 42% (an average of 31%) of flow in the Apex River under an emergency amendment to the water licence and under emergency Fisheries Act Authorization – Emergency Circumstances 22-HCAA-02043 (DFO 2022) over a 7-day period from Sept 13-19, 2022. Baseline fish habitat within the Apex River was studied and reported on (Attachment H), and separately, a monitoring program was undertaken during the pumping operation to detect impacts to fish and fish habitat (Attachment I). Wetted width, water level/depth, habitat conditions, and fish presence were monitored at one upstream location, at the pumping location, and at five downstream stations on the Apex River. Most percent differences measured or these parameters were within 10% of the previous value measured, except for one location downstream of a large pool (which should be insensitive to hydrological changes), where larger differences were attributed to measurement error. The consultant conducting the monitoring concluded that no documented impacts to fish and fish habitat occurred, and that no fish or fish habitat offsetting requirements are needed per the FAA (Nunami Stantec, 2023; Attachment H). Based on the monitoring conducted in 2022 higher extraction rates than are being proposed with the LTWP, field monitoring is not warranted.	Attachment H - Fish Habitat Assessment of the Niaqunguk (Apex) River Attachment I - Project Summary Report: Iqaluit 2022 Lake Geraldine Resupply (Apex River Supplementary Pumping Program): Report of Activities 3AM-IQA1626 and 22-HCAA-02043
				• Update hydraulic modelling to assess the effects of reduced flows on depth, velocity, and wetted area in the Apex River and evaluate whether changes may create barriers to fish migration or result in loss of fish habitat.	Hydraulic modelling was also completed in the report referenced above, and he City suggests that hydraulic modelling is not required.	
				• Establish contingency measures (e.g., reduction or cessation of withdrawal rates) that will be implemented if monitoring detects adverse effects to fish or fish habitat.	Most likely the contingency measures to be implemented if monitoring indicates that non-predicted adverse effects to fish or fish habitat are occurring when pumping will be as follows: 1) Temporarily cease pumping to allow water levels to reestablish to what would normally occur. 2) If fish stranding is observed, capture and liberate the stranded fish. 3) Resume pumping at a lower rate and monitor streambed conditions.	
DFO-TR-03	Water Withdrawal from Lake Qiqitalik		The City of Iqaluit proposes to withdraw, through the open-water season, 1.1 million m^3/year of water from Lake Qiqitalik, which is a fish-bearing lake (i.e., inhabits Arctic Char). This represents 20% of the lake's volume. Water withdrawal may affect fish and fish habitat through reductions in water levels, changes in downstream flow conditions, and loss or alteration of littoral habitat. In addition, water withdrawal activities can cause direct fish mortality through stranding, entrainment, or impingement. Littoral areas provide important spawning, rearing, feeding, and refuge habitat for fish, and reductions in water levels may decrease the availability or suitability of these habitats, resulting in habitat dewatering or fish stranding. Water level reductions may also influence outflow conditions at the lake outlet by reducing discharge and altering channel depth and velocity. These changes could affect fish movement between Lake Qiqitalik and downstream habitats and may reduce the availability of connected aquatic habitat. No information was provided by the City of Iqaluit on potential effects to littoral and downstream habitat or seasonal habitat availability during open water periods.	DFO recommends that the proponent: • Demonstrate that proposed maximum withdrawal rates from Lake Qiqitalik will not adversely affect outlet flow conditions, or in barriers to fish migration.	The fish & fish habitat report (Attachment 40) notes that the outlet of Lake Qikiqtalik is mainly subsurface beneath cobbles and boulders, and that this combined with the steep slope make it unlikely that fish can use the tributary for fish passage. The Lake Qikiqtalik water withdrawal study (Attachment 34) notes that the entire channel between Lake Qikiqtalik and the Apex River is characterized by defined channel sections where the water is visible at the surface and ill-defined channel sections characterized by boulder fields where the water is flowing below the surface. Hence, impacts to fish and fish habitat within this drainage between the lake and the river are negligible. As noted in the Apex River water withdrawal study (Attachment 37), the catchment area of the Apex River at the confluence consists of a 3,602 ha mainstem catchment, a 634.4 ha Lake Qikiqtalik catchment, and another 669.7 ha catchment between the outlet of Lake Qikiqtalik and the Apex confluence (see Figure 3-2 in Attachment 37). Thus, Lake Qikiqtalik represents about 13% of the total flow in the Apex River at the confluence. Withdrawals from Lake Qikiqtalik are expected to occur during freshet in June, when there is an excess of water throughout the system.	
				• Provide details on potential changes in habitat caused by water withdrawal over operational seasons, including loss of nearshore lake areas and changes to depth. This should include a review of annual recharge capacity and whether ongoing withdrawals over multiple years could result in lake levels falling below the threshold used in the assessment.	Modelling assumes that the lake elevation will return to the spill elevation of El. 203 m, which is a reasonable assumption. Targeting water withdrawals during freshet, when lake water levels are high and discharges to the downstream are their highest, will ensure that the lake will not be drawn down to the spill elevation.	
				• Implement monitoring of water withdrawal activities at Lake Qiqitalik shoreline and outlet to confirm that withdrawal does not result in alterations or loss of habitat or outflow conditions. Monitoring should focus on shoreline exposure, fish stranding observations, water levels, annual recharge patterns, and outlet depth/velocity during periods of active withdrawal, and be used to verify that modelled predictions accurately reflect site conditions.	The requirement for a monitoring program will be discussed with the DFO.	
				• Establish contingency measures (e.g., reduction or cessation of withdrawal rates) that will be implemented if monitoring detects adverse effects to fish or fish habitat.	Contingency measures will be developed in consultation with the DFO.	

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