Environmental Protection Operations Directorate
Prairie & Northern Region
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ECCC File: 6200 000 001
NWB File: 3AM-IQA1626

November 26, 2020

via email at: licensing@nwb-oen.ca

Richard Dwyer
Manager Licencing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0

Dear Richard Dwyer:

RE: 3AM-IQA1626 City of Iqaluit Water Licence Amendment Application

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Nunavut Water Board (NWB) in response to the commitments for the amendment application for water licence 3AM-IQA1626 by the City of Iqaluit (the Proponent) and is providing its comments and recommendations for NWB consideration.

ECCC's specialist advice is based on our mandate pursuant to the *Canadian Environmental Protection Act* and the pollution prevention provisions of the *Fisheries Act.*

The following comments are provided:

Reference:

- October 9, 2020, memo from Dillon Consulting to City of Iqaluit, et al.; Subject: *July 2020 Regulator (ECCC/CIRNAC) Comments – Responses October 9*

COMMITMENT 1:

Topic: Baseline monitoring

Previous ECCC recommendation: ECCC recommends that the proponent:

- Provide raw and summarized data (including field results, laboratory reports, a tabulated summary, and a comparison of monitored parameters to relevant guidelines) for the baseline conditions assessment of the Waste Transfer Station and landfill conducted by Dillon Consulting in 2019; and
- Show how the baseline information has been used and incorporated into design/mitigation as needed.

Proponent's response: The Proponent provided an updated Facility Monitoring Plan.

ECCC comment/recommendation: The Proponent's response is acceptable. ECCC has no further comments on this topic.

COMMITMENT 2:

Topic: Unbaled waste

Previous ECCC recommendation: ECCC recommends that:

- The proponent identify measures to ensure the containment of unbaled C&D debris and any unbaled MSW within the landfill cell.
- Contingency measures, such as potential cover sources, should be available to ensure containment of unbaled waste in the event of any extended or recurring operational issues at the Waste Transfer Station.
- The proponent conduct an evaluation of the durability of the baled wastes' plastic cover, which should include a discussion of alternative cover methods.

Proponent's response: The Proponent provided updated Sections 8.3.1 and 9.1 of the Operations and Maintenance Manual.

ECCC comment/recommendation: The Proponent's response is acceptable. ECCC has no further comments on this topic.

COMMITMENT 3:

Topic: Acid Rock Drainage/Metal Leaching (ARD/ML)

Previous ECCC recommendation:

- ECCC recommends that the proponent sample project borrow source locations in order to identify any Acid Rock Drainage/Metal Leaching potential that could affect water quality. Testing should be completed using static and kinetic methods to characterize representative units.
- ECCC recommends that the proponent avoid quarry/units that are determined to have ARD/ML potential.

ECCC suggests this recommendation could be resolved by a license condition, or by inclusion of this item in a quarry plan.

Proponent's response: The Proponent's response states that a licence condition will be requested by the applicant to resolve this commitment.

ECCC comment/recommendation: The Proponent's response is acceptable. ECCC has no further comments on this topic.

COMMITMENT 4:

Topic: Leachate treatment – Landfill

Previous ECCC recommendation: ECCC recommends that the proponent identify treatment options beyond the existing system, and determine the lead-time needed to install and commission the treatment system.

ECCC suggests this recommendation could be resolved by inclusion of a licence condition that requires the City of Iqaluit to (1) characterize the leachate and (2) submit a treatment plan for Board approval.

Proponent's response: The Proponent provided Section 12 (Leachate Management) of the revised Operations and Maintenance Manual (Version 4.0), which includes a description of the primary operational requirements relating to leachate management at the landfill, for the initial leachate collection and management system.

ECCC notes that the commitment table on page 2 of the Proponent's response document indicates that the City of Iqaluit will request a licence condition; however, the response to Commitment 4 does not indicate whether this is still the Proponent's intention.

ECCC comment/recommendation: ECCC recommends that the Proponent clarify whether a licence condition will be requested by the City of Iqaluit to resolve Commitment 4.

COMMITMENT 5:

Topic: Leachate treatment – Landfill

Previous ECCC recommendation: ECCC requests that the City describe how volumes of effluent and precipitation would be managed under a potential high precipitation scenario (i.e., annual increase of 9 percent over baseline climate) during the first 2 years of operations.

Proponent response: The Proponent provided an update regarding leachate pond design, and indicated that the design calculations reflect a 9% increase in precipitation over the first two years above baseline.

ECCC comment/recommendation: The Proponent's response is acceptable. ECCC has no further comments on this topic.

COMMITMENT 6:

Topic: Groundwater

Previous ECCC recommendation: ECCC recommends that the proponent revise the Environmental Protection Plans [i.e., EPP - Construction Phase; and EPP - Operations, Closure and Post-Closure Phases] to include groundwater as an environmental consideration for this project.

Proponent response: In response to Commitment 6, the proponent provided the updated Section 5.0 (Monitoring and Inspection) for both EPP documents. Per Section 5.0 of the EPP - Operations, Closure and Post-Closure Phases document, active layer groundwater monitoring will document water quality parameters at pre-determined groundwater sampling locations in proximity to the landfill. However, this section does not indicate any contingency mitigations for groundwater quality.

ECCC comment/recommendation: ECCC recommends that the EPP - Operations, Closure and Post-Closure Phases document also describe the contingency mitigations that will be available, should monitoring results indicate the migration (or possible migration) of contaminant(s) into groundwater.

COMMITMENT 7:

Topic: Environmental Protection Plans, Section 4.0 – Mitigation measures tables

Previous ECCC recommendation: ECCC recommends that the mitigation measures tables located in Section 4.0 of both Environmental Protection Plans (EPPs) each include a measure specifying that erosion and sediment control activities be conducted in accordance with the Erosion and Sediment Control Plan.

Proponent response: The Proponent provided the updated Section 4.0 (Environmental Protection Measures) for both EPP documents.

ECCC comment/recommendation: The Proponent's response is acceptable. ECCC has no further comments on this topic.

COMMITMENT 8:

Topic: Environmental Protection Plans, Section 5.0 (Monitoring and Inspection)

Previous ECCC recommendation: ECCC recommends that the proponent submit the monitoring and inspection sections of the Environmental Protection Plans [i.e., EPP-Construction Phase; and EPP-Operations, Closure and Post-Closure Phases] prior to commencement of construction.

ECCC requests that the City:

- Submit the updated monitoring and inspection section (i.e., Section 5.0) of the Environmental Protection Plan – Construction Phase document for review; and
- Update and submit the monitoring and inspection section (i.e., Section 5.0) of the Environmental Protection Plan – Operations, Closure and Post-Closure Phases document for review.

Proponent response: The Proponent provided the updated Section 5.0 (Monitoring and Inspection) of both the EPP-Construction Phase document and the EPP-Operations, Closure and Post-Closure Phases document.

ECCC comment: The updated Section 5.0 of the EPP – Construction Phase document states that a site-specific Construction Monitoring Plan (CMP) will be developed by the contractor responsible for construction, prior to the initiation of construction activities, and lists monitoring and inspection activities which are to be included in the CMP. However, this list does not include the sediment monitoring or TSS/turbidity monitoring described in Section 4.3 (Surface Water Mitigation Measures and Best Management Practices) of the updated Erosion and Sediment Control (ESC) Plan. The Proponent should ensure that the requirements for the site-specific CMP incorporate the monitoring elements of the updated ESC Plan.

Section 5.0 of the EPP – Construction Phase document proposes that the following activity be included in the Construction Monitoring Plan:

- *Prior to discharging any water to the environment, inspect the water for any signs of contaminants. If signs of contaminants are present, the water must be collected and hauled to a disposal facility or sampled and analyzed to determine if the water meets*

Canadian Council of Ministers of the Environment water quality guidelines for the protection of aquatic life.

This appears to be a subjective inspection and it is unclear how contaminants would be assessed, therefore ECCC proposes alternate wording in the recommendation below. Additionally, as the CCME are not appropriate objectives for end-of-pipe terrestrial discharge, this requirement should identify appropriate thresholds for terrestrial discharges.

The updated Section 5.0 of the EPP - Operations, Closure and Post-Closure Phases document provides a brief summary of the operational monitoring activities recommended in the Facility Monitoring Plan (FMP) and notes that the complete FMP should be referred to when implementing the FMP activities. ECCC has no further comments regarding Section 5.0 of the EPP – Operations, Closure and Post-Closure Phases document.

ECCC recommendation: ECCC provides the following recommendations for Section 5.0 of the EPP - Construction Phase document, with respect to the monitoring and inspection activities to be included in the site-specific Construction Monitoring Plan:

- Incorporate the sediment and TSS/turbidity monitoring requirements from Section 4.3 (Surface Water Mitigation Measures and Best Management Practices) of the updated Erosion and Sediment Control Plan.
- Revise the final bullet of the Construction Monitoring Plan requirements as follows:
    - Replace the phrase "*inspect the water for any signs of contaminants"* with "*inspect the water for any visible sheen or debris*"; and
    - Identify appropriate thresholds for terrestrial discharges.

COMMITMENT 9:

Topic: Total Suspended Solids

Previous ECCC recommendation: ECCC recommends that the proponent:

- Conduct sediment monitoring in relation to any project disturbances in or near water (e.g., in-stream construction); and
- Conduct TSS/turbidity monitoring routinely during in-stream works, and identify thresholds and accompanying management actions in advance of such in-stream works.

Proponent response: The Proponent provided the updated Section 4.3 of the Erosion and Sediment Control Plan.

ECCC comment/recommendation: The Proponent's response is acceptable. ECCC has no further comments on this topic.

COMMITMENT 10:

Topic: Visual Monitoring

Previous ECCC recommendation: ECCC recommends that the proponent increase the frequency of visual monitoring during and following freshet and major rainfall events, particularly with respect to monitoring for signs of erosion and sedimentation.

Proponent response: The Proponent provided the updated Section 3.1.1 (Visual Monitoring Plan) of the Facility Monitoring Plan.

ECCC comment/recommendation: The Proponent's response is acceptable. ECCC has no further comments on this topic.

COMMITMENT 11:

Topic: Landfill surface monitoring

Previous ECCC recommendation: ECCC recommends that the proponent add TSS and phenols to the surface water monitoring parameters listed in Section 3.5.1 (Surface Water Monitoring Plan) of the Facility Monitoring Plan.

Proponent response: The Proponent provided the updated Section 3.4.1 (Surface Water Monitoring Plan) of the Facility Monitoring Plan, which incorporates the additional monitoring parameters.

ECCC comment/recommendation: The Proponent's response is acceptable. ECCC has no further comments on this topic.

COMMITMENT 12:

Topic: Groundwater Monitoring

Previous ECCC recommendation: ECCC recommends that the proponent:

- Include the monitoring of dissolved metals, in addition to total metals, for groundwater samples; and
- Incorporate a description of how the groundwater monitoring results will be assessed (for example, compare results to baseline sample concentrations, applicable license requirements and recognized groundwater guidelines) into Section 3.7 (Active Layer Groundwater Monitoring) of the Facility Monitoring Plan.

Proponent response: The Proponent provided the updated Section 3.6 (Active Layer Groundwater Monitoring) of the Facility Monitoring Plan. This update indicates that the active layer groundwater monitoring results will be compared to surface water quality guidelines, as the applicable exposure and migration pathways for this intermittent migration pathway are surface water receptors. This section also provides a list of groundwater monitoring parameters. ECCC notes that although ‘metals’ is listed as a parameter, the metal fractions to be analyzed (i.e., total and dissolved metals) is not specified.

ECCC comment/recommendation: ECCC recommends that the groundwater monitoring parameters listed in Section 3.6 (Active Layer Groundwater Monitoring) of the Facility Monitoring Plan be updated to include both total metals and dissolved metals, rather than simply ‘metals’.

COMMITMENT 13:

Topic: Effluent discharge

Previous ECCC recommendation: ECCC recommends that the proponent characterize the effluent to determine compatibility with the wastewater treatment process prior to transporting effluent to the City's Waste Water Treatment Plant (WWTP). The proponent may need to implement alternative small-scale treatment if effluent quality would render the options discussed unacceptable.

ECCC requests that the City provide the updated Section 12.2 of the Operations and Maintenance Manual and the updated Section 3.9 of the Facility Monitoring Plan for review.

Proponent response: The Proponent provided:

- Section 12 (Leachate Management) of the revised Operations and Maintenance Manual (Version 4.0), and
- Updated Section 3.8 (Effluent Discharge Limits) of the Facility Monitoring Plan.

Per Section 12.2 (Landfill) of the revised O&M manual:

- *Should it be determined that storage volumes within the ponds are nearing design capacity as measured by water levels in the ponds and corresponding capacity chart, the City, in consultation with the NWB, will access contingency actions including transporting quantities of leachate effluent via pumper truck from the site to either the West 40 landfill (e.g., controlled discharge through the existing waste mass) or the City's WWTP. As a secondary contingency (to be implemented only with the approval of NWB), a valved discharge manhole at the second storage pond will allow for the controlled release of effluent to a gravel bed diffuser. It is acknowledged that it is anticipated that implementation of the secondary contingency measure will necessitate additional environmental effects (e.g., surface water) monitoring requirements at the Landfill site.*

- *In the event of significant volumes of poor quality leachate that cannot be stored in the holding ponds, three options are available:*
    1. *Haul and dispose of at the West 40 site;*
    2. *Haul and dispose of at the City WWTP (acknowledging the potential impacts to the WWTP process if the strength is significantly above the plant's rated capacity. If this is the case, it may need to be diluted and discharged over an extended period of time;*
    3. *Discharge to the level spreader under the approval and monitoring of the NWB.*

ECCC comment/recommendation: It is unclear whether the option "*Discharge to the level spreader under the approval and monitoring of the NWB*" is the same or different as the contingency described as "*controlled release of effluent to a gravel bed diffuser*". Both of these potential leachate management options are included in Section 12.2 (Landfill) of the revised Operations and Maintenance Manual. ECCC recommends that the Proponent clarify the description of these two options.

Section 12.2 (Landfill) of the revised Operations and Maintenance Manual (Version 4.0) includes a list of landfill leachate monitoring parameters, as does the updated Section 3.8 (Effluent Discharge Limits) of the Facility Monitoring Plan. ECCC notes that 'total phenols' is listed in the

revised O&M manual list, but not in the FMP list. ECCC recommends that Section 3.8 (Effluent Discharge Limits) of the Facility Monitoring Plan be updated to include 'total phenols' in the list of landfill leachate monitoring parameters.

COMMITMENT 14:

Topic: Leachate Management – Landfill

Previous ECCC recommendation: ECCC recommends that the proponent:

- Provide details for assessing landfill leachate/effluent characteristics; and
- Include a summary in the annual report of the landfill leachate management system, including leachate generation rates, leachate/effluent characteristics, holding pond capacity, and an update on leachate management/treatment.

ECCC requests that the City provide the updated Section 12.2 of the Operations and Maintenance Manual for review.

Proponent response: The Proponent provided Section 12.2 (Landfill) of the revised Operations and Maintenance Manual (Version 4.0), which was also provided in response to Commitment 13. Section 12.2 includes a list of landfill leachate monitoring parameters and a requirement for the recommended summary to be provided in the annual report.

ECCC comment/recommendation: ECCC's comments and recommendations regarding the Proponent's response to Commitment 13 also apply to the response to Commitment 14.

COMMITMENT 15:

Topic: Leachate Management – Waste Transfer Station (WTS)

Previous ECCC recommendation: ECCC recommends that the proponent:

- Provide secondary containment for the leachate holding tank;
- Characterize the WTS leachate to determine compatibility with the wastewater treatment process prior to transporting leachate to the City's WWTP;
- Track the WTS leachate generation rates/volumes and treatment/disposal details; and
- Report the WTS leachate generation rates/volumes, treatment/disposal details, and characterization results in the annual report.

ECCC requests that the City provide the updated Sections 12.1 and 14.0 of the Operations and Maintenance Manual for review.

Proponent response: The Proponent provided updated Sections 12.1 and 14.0 of the revised Operations and Maintenance Manual (Version 4.0).

Per Section 12.1 (Waste Transfer Station) of the revised Operations and Maintenance Manual:

> *Leachate within the WTS is generated during the waste baling process, as liquid is squeezed out of the waste mass. This liquid is collected via a shallow trench in the slab around the perimeter of the baling unit, with the effluent subsequently being pumped to the 4500L sewage holding tank. The sewage holding tank is XLPE polyethylene double wall construction. The secondary (outer) tank has 120% of the capacity of the inner tank and serves as containment in the event of a leak or spillage. The tank is equipped with an*

interstitial leak detector. As required, this liquid is collected and transported to the City's WWTP for treatment. A record of details related to the transport of leachate to the WWTP (e.g., date, and quantity and/or quality) shall be maintained at the WTS. At the request of the WWTP operator, a characterization of the WTS leachate should be conducted to ensure compatibility with the facility's treatment process and infrastructure as defined in Table 2: Summary of Design Flows and Loads (Iqaluit WWTP Upgrade Redesign Development Report, prepared by Stantec, November 2017).

ECCC comment/recommendation: It is unclear whether WTS leachate will necessarily be characterized to ensure compatibility with the WWTP treatment process, as the response indicates that WTS leachate should be characterized *at the request of the WWTP operator*.

ECCC notes that Section 3.8 (Effluent Discharge Limits) of the updated Facility Monitoring Plan states: *The City WWTP (designed in 2016 and commissioned in 2019) was intended for processing organic loading, namely BOD and TSS. Based on typical leachate quality, this has a risk of upsetting the plant.*

Given the risk of upsetting the treatment plant, ECCC recommends that WTS leachate be characterized prior to transfer to the WWTP until compatibility is confirmed, and that the O&M manual include wording to this effect.

COMMITMENT 16:

Topic: Liner installation timing and planning

Previous ECCC recommendation: ECCC recommends that the proponent provide in the Annual Report:

- An update on the capacity of the landfill cell currently in use, including the installation timing calculation (inputs and result); and
- Discuss the required actions/schedule for the design

ECCC suggests that the licence include a condition under the annual reporting requirements for (1) an update as outlined in the first bullet of the recommendation [i.e., an update on the capacity of the landfill cell currently in use, including the installation timing calculation (inputs and result)], and (2) a brief status report on the requirements for the next disposal area in the sequence.

Proponent response: The Proponent's response states that a license condition will be requested by the applicant to resolve this commitment.

ECCC comment/recommendation: The Proponent's response is acceptable. ECCC has no further comments on this topic.

COMMITMENT 17:

Topic: New Technology/ Lessons Learned

Previous ECCC recommendation: ECCC recommends that the proponent:

- Identify and describe measures to prevent/mitigate the challenges described (i.e., substantial volumes of poor quality leachate, and down time during mechanical breakdowns and for maintenance), and discuss their anticipated effectiveness;
- Describe how the effectiveness of these prevention/mitigation measures will be monitored; and
- Document lessons-learned to inform subsequent stages of construction and operation.

ECCC requests that the City provide the outstanding information for review, and suggests that the Proponent contact the City of Yellowknife to see if there are common elements in the proposed system that may lead to problems. ECCC can provide the City of Iqaluit with contact information for the City of Yellowknife's Manager of Sustainability and Solid Waste.

Proponent response: In response to Commitment 17, the Proponent provided the revised Operations and Maintenance Manual (Version 4.0). However, it is unclear which sections of the O&M manual address this recommendation.

Also in response to Commitment 17, page 251 of the Commitment Response document indicates that the Proponent is currently working on scheduling a discussion with all involved parties.

ECCC comment/recommendation: It is unclear how the revised Operations and Maintenance Manual addresses Commitment 17. ECCC requests that the Proponent clarify which sections of the O&M manual pertain to the following aspects of ECCC's recommendation:

- Identify and describe measures to prevent/mitigate the challenges described (i.e., substantial volumes of poor quality leachate, and down time during mechanical breakdowns and for maintenance), and discuss their anticipated effectiveness;
- Describe how the effectiveness of these prevention/mitigation measures will be monitored; and
- Document lessons-learned to inform subsequent stages of construction and operation.

ECCC also requests that the Proponent provide an update regarding the discussion referenced on page 251 of the Commitment Response document.

If you need more information, please contact Victoria Shore at Victoria.Shore@canada.ca.

Sincerely,

Margaret Fairbairn, Acting Regional Director
Environmental Protection Operations Directorate, Prairie Northern Region

cc: Brian Asher, Acting Head, Environmental Assessment North (NT and NU)