

# Amendment Application for the City of Iqaluit Water Licence 3AM-IQA1626

# Nunavut Water Board Technical Meeting

## August 12 - 13, 2020

ᐋᓃᑭᑦᐱᐅᓂᓄᑦ ᐆᑭᐸᐳᑦ ᑲᑲᐱᐅᓂᓄᑦ  
ᐃᒪᓴᑯᑦ ᑕᐃᓴᓄᑦᑭᓃᑭᐳᓂᓄᑦ 3 ᐅᓂᑕᑦᑭᐳᓂᓄᑦ -IQA1626

መፅደቅ ልረሲታችንን በሚጠቅምበት  
ጥቅም 12 - 13, 2020



# Outline

## 1. Role and Responsibilities

## 2. Contributions to the Water Licence Review

### 3. Technical Review Comments

- I. Reclamation of West 40 landfill
- II. Runoff from baled waste at transfer station
- III. Landfill leachate treatment
- IV. Landfill leachate collection
- V. Surface water management at landfill
- VI. Fencing
- VII. Permafrost considerations
- VIII. Waste transfer station geotechnical report
- IX. Landfill design drawings
- X. Operations

#### 4.Comment Resolution Status

## 5. Conclusion


$${}^{\circ}b_n C \triangleright \text{L}^b d^c$$

1. ሊገኝላቸው ይችላሉ ለገንዘብ ጥገና ምርመራ
2. ለገንዘብ ጥገና ምርመራ ሲሆን ለገንዘብ ጥገና ምርመራ ሲሆን
3. ምርመራ ምርመራ ምርመራ
  - I. ምርመራ ምርመራ West 40, ምርመራ ምርመራ
  - II. ምርመራ ምርመራ ምርመራ ምርመራ
  - III. ምርመራ ምርመራ ምርመራ ምርመራ
  - IV. ምርመራ ምርመራ ምርመራ ምርመራ
  - V. ምርመራ ምርመራ ምርመራ ምርመራ ምርመራ
  - VI. ምርመራ ምርመራ
  - VII. ምርመራ ምርመራ ምርመራ ምርመራ ምርመራ
  - VIII. ምርመራ ምርመራ ምርመራ ምርመራ ምርመራ
  - IX. ምርመራ ምርመራ ምርመራ ምርመራ ምርመራ
  - X. ምርመራ ምርመራ ምርመራ ምርመራ ምርመራ
4. ምርመራ ምርመራ ምርመራ ምርመራ ምርመራ ምርመራ
5. ምርመራ ምርመራ ምርመራ ምርመራ ምርመራ ምርመራ

$$\begin{array}{l} \Lambda C_n \triangleleft^b H \Delta^c \triangleleft L \\ b L \Gamma \leq n \triangleleft C^a \Gamma^c \end{array}$$

ልዩ ስራዎችን ለመፈጸም፣  
 ምሥራቅ አካባቢ፣ ልዩ ስራዎችን ለመፈጸም  
 ልዩ ስራዎችን (CIRNAC) ለመፈጸም፣  
 ስራዎችን፣ ልዩ ስራዎችን ለመፈጸም፡

- [illegible]



Δb↱P↱c ρΓρσbδc

CIRNAC made the following submissions to the Nunavut Water Board regarding application to amend Water Licence 3AM-IQA1626 by the City of Iqaluit (City):

- Information Requests: May 6, 2020
- Technical Review Comments: July 17, 2020

[illegible]

- ኃይለማርያም ልሳነስ ጋራ ጥያቄ አቅርቦታል፡  
ሰኔ 6, 2020
- ለጥቅምት 17 ቀን ስርዓት ማካተት ልማት ጋራ ጥያቄ አቅርቦታል፡  
ሰኔ 17, 2020



ΛCηΔΔ<^ ρΓρσ<\_^ Δ^bΔρ^ρ^

# TECHNICAL REVIEW COMMENTS



I.  $\triangleright \cap^c \cap^c \rho \sigma^c \mathbf{b}$  West 40,  $\Gamma$   
 $\mathbf{b} \triangleright \mathbf{b} \triangleright \rho \sigma^c \Gamma^b$

- $\Delta^{\epsilon} b_{\perp}^{\alpha} \sigma^{\mu} \rho_{\mu} \sigma^{\nu}$   
 $\Gamma \langle \sigma^{\mu} \rho_{\mu} \sigma^{\nu} \rangle^c <^{\epsilon} \Omega^b C D^{\epsilon}$   
 $\triangleright \mathfrak{P}^{\epsilon} \mathcal{L} \ 40 \ \text{መደብ} \ \text{ካልከል} \ \sigma^{\mu} \rho_{\mu}$   
 $2014 \ \langle \mathcal{D} \Delta^{\alpha} \Omega^{\epsilon} b \Gamma J C D^{\epsilon} \mathcal{L}^c$   
 $\triangleright^c \mathcal{J} \Gamma \ \Omega \mathcal{D} \Omega \Delta^{\epsilon} \rho_{\mu} \mathcal{L}^{\epsilon} \sigma^{\nu}$   
 $\mathcal{L} \mathcal{D} \sigma^{\mu} \langle \sigma^{\mu} \sigma^{\nu} \rangle^c <^{\epsilon} \Omega^{\alpha} \sigma^{\mu} \rho_{\mu}$   
 $\wedge^{\epsilon} \rho_{\mu} b_{\perp}^{\alpha} \langle \sigma^{\mu} \rho_{\mu} \sigma^{\nu} \rangle^c \mathcal{L}^{\epsilon} \mathcal{D} \sigma^{\mu}$   
 $\rho_{\mu} \Delta^{\epsilon} \Gamma^b.$
- $CIRNAC, d^c \ \epsilon b \triangleright \rho_{\mu} \mathcal{L}^{\epsilon} \rho_{\mu} \mathcal{L}^c$   
 $\mathcal{D} \rho_{\mu} \rho_{\mu} \langle \sigma^{\mu} \sigma^{\nu} \rangle^c \sigma^{\mu}$   
 $\triangleright \rho_{\mu} \rho_{\mu} \sigma^{\mu} d^c \triangleright^c \mathcal{J} \Gamma \ \text{መደብ}$   
 $\text{ካልከል} \ \sigma^{\mu} \rho_{\mu} \langle \mathcal{L}^c$   
 $\text{መርሃታዊ} \ \rho_{\mu} \rho_{\mu} \sigma^{\mu} d^c \mathcal{L} \mathcal{D} \mathcal{L}$   
 $\Gamma^b \rho_{\mu}^c$



I.  $\triangleright \cap^a \cap^c \rho \sigma^a \mathbf{b}$  West 40,  $\Gamma$   
 $\mathbf{h} \triangleright \mathbf{z} \triangleright \lambda \sigma^a \Gamma^b$

◁▷↵↻▷↵↻:

- [illegible]



## II. $d\Delta\varphi^C$ $\varphi d\Delta\sigma^C$

- [illegible]

- ወርሀዊ ጥቅም ላይ የዋለውን ተፈጻሚነት ለማረጋገጥና ለመጠበቅ ማስተካከል አስፈሪ ነው።

- [illegible]



ll. dΔ<sup>7</sup>c ṽd<sup>9</sup>Δσ<sup>c</sup> ṽd<sup>9</sup>Δc<sub>2</sub>Δ▷<sup>7</sup>σ<sup>c</sup>

◁▷↵↻▷↵↻:

- [illegible]





### III. ወደፊት ካልጎረፍናል

◁▷c<sup>a</sup>C▷<sup>a</sup>d↳▷<sup>a</sup>b.

- [illegible]

IV.  $\mathcal{M}^{\mathcal{C}} \rightarrow \mathcal{M}^{\mathcal{C}} \times \mathcal{M}^{\mathcal{C}} \rightarrow \mathcal{M}^{\mathcal{C}}$

- A robust leachate collection system is critical for environmental protection and reducing future liability as it ensures continued leachate removal from the landfill into the post closure period, reducing potential for uncontrolled discharges.
- There are several elements missing from these drawings and the Method of Construction Statement Report, which should be incorporated in final documents.

- [illegible]

IV.  $\mathcal{M}^c$  ካልተሰጠ ለ  $\mathcal{M}^c$  ለሚፈጸም  $\mathcal{L}^c$  ስራ

◁▷↵↻⌂

ᠢᠨᠭ ᠳᠤᠳᠤᠰᠡᠵᠦᠨᠬᠡᠴᠣᠷᠢᠶᠢᠨᠲᠦᠸᠦᠳᠦᠰᠡᠯᠦ:

- [illegible]



## V. Surface water management at landfill

- Surface water management is important at landfills to prevent run-on to landfill cells and operating areas by conveying clean off-site runoff around the site.
- It is also important to avoid erosion of built up berms to prevent structural damage to landfill cells or roads.
- Several elements are missing or unclear from the 90% submission design drawings for the landfill.



## V. ᐃᐱᑦᐅᐅ ᐱᑦᐅᐅᐅ ᐱᐅᐅᐅᐅᐅ

- ᐃᐱᑦᐅᐅ ᐱᐅᐅᐅᐅᐅᐅ  
ᐱᐅᐅᐅᐅᐅᐅ ᐱᐅᐅᐅᐅᐅᐅ  
ᐅᐅᐅᐅᐅᐅᐅᐅ ᐱᐅᐅᐅᐅᐅᐅ  
ᐅᐅᐅ ᐱᐅᐅᐅᐅᐅᐅᐅᐅ ᐅᐅᐅᐅ  
ᐅᐅᐅ ᐱᐅᐅᐅᐅᐅᐅᐅ.
- ᐅᐅᐅ ᐱᐅᐅᐅᐅᐅᐅ  
ᐱᐅᐅᐅᐅᐅᐅᐅᐅᐅᐅ  
ᐱᐅᐅᐅᐅᐅ ᐱᐅᐅᐅᐅᐅᐅᐅ  
ᐅᐅᐅᐅᐅᐅᐅᐅᐅᐅᐅᐅ  
ᐅᐅᐅᐅ ᐱᐅᐅᐅᐅᐅᐅ  
ᐅᐅᐅᐅᐅᐅᐅᐅ ᐅᐅᐅᐅᐅᐅᐅ.
- ᐅᐅᐅᐅ ᐱᐅᐅᐅᐅᐅᐅ  
ᐅᐅᐅᐅᐅᐅᐅᐅᐅᐅ  
ᐅᐅᐅᐅᐅᐅᐅᐅ 90%,ᐅᐅ  
ᐅᐅᐅᐅᐅᐅᐅᐅᐅ ᐱᐅᐅᐅᐅᐅᐅᐅ  
ᐱᐅᐅᐅᐅᐅᐅᐅᐅ ᐱᐅᐅᐅᐅᐅᐅ.

v. ΔL▷<sup>c</sup> ς̂<sup>b</sup>⊆σ L<sup>c</sup>▷dσ<sup>b</sup> Γ◁σ<sup>c</sup>ρσ<sup>c</sup><sup>b</sup>

◁▷↵↻▷↵↻:

- [illegible]

## VI. $\Delta E_{\text{CR}}^{\text{eff}}$

- The landfill design drawings do not provide an indication of which areas will be fenced.
- Fences are not included in any of the plan views and there is no indication of a gate to the overall site or fencing around the landfill cell, which would allow site access to the general public and terrestrial wildlife.

- [illegible]



## VI. $\Delta^c L^c d_m^c$

◁▷<sup>c</sup>d<sup>b</sup>▷◁<sup>c</sup>b.

- [illegible]



## VII. Permafrost considerations

### Recommendation:

- (7.1) Describe what construction methodologies and design approach will be used to minimize impact on permafrost.
- (7.2) Describe permafrost conditions and how they have been addressed at the proposed leachate pond location.
- (7.3) Describe the rationale for thermistor locations and how they will monitor ground temperature changes.
- (7.4) Explain why heat generation from decomposing municipal waste was not considered in the thermal modeling of the landfill.

## VII. ኖፊሞስቶር ልማት ማስፈራሪያ

### ፈቃድ ማስፈራሪያ:

- (7.1) ልማት ማስፈራሪያው ላይ ያለውን የኖሞስቶር ሁኔታዎች ለማረጋገጥና ለማስፈራሪያው ላይ ያለውን ለውጥ ለመቀነስ የሚያገለግል ልማት ማስፈራሪያውን ያስፈልጋል።
- (7.2) ልማት ማስፈራሪያው ላይ ያለውን የኖሞስቶር ሁኔታዎች ለማረጋገጥና ለማስፈራሪያው ላይ ያለውን ለውጥ ለመቀነስ የሚያገለግል ልማት ማስፈራሪያውን ያስፈልጋል።
- (7.3) ልማት ማስፈራሪያው ላይ ያለውን የኖሞስቶር ሁኔታዎች ለማረጋገጥና ለማስፈራሪያው ላይ ያለውን ለውጥ ለመቀነስ የሚያገለግል ልማት ማስፈራሪያውን ያስፈልጋል።
- (7.4) ልማት ማስፈራሪያው ላይ ያለውን የኖሞስቶር ሁኔታዎች ለማረጋገጥና ለማስፈራሪያው ላይ ያለውን ለውጥ ለመቀነስ የሚያገለግል ልማት ማስፈራሪያውን ያስፈልጋል።



## VIII. ሊጋዕሪያ ፊኅሪያ ጋህጽ

- [illegible]

◁▷<sup>c</sup>d<sup>b</sup>▷<sup>c</sup>b.

- (8)  $\triangleleft \mathcal{D} \Delta^a \underline{a} \mathcal{P}^c \mathcal{N}^c \mathcal{P}^c \sigma^b$   
 $\triangleleft \mathcal{P}^a \mathcal{P}^a \sigma^b \mathcal{D} \mathcal{H}^c \mathcal{N}^c \mathcal{P}^c \mathcal{N}^c$ .



- (9) Clarify the construction methodology for cuts and ditches at the landfill and include these details in the final drawings.



IX. ወደፊት ካልገባችሁ ጋር በባህሪና ሥራ

- [illegible]

◁▷↵↻▷↵↻:

- [illegible]



## X. Operations

- There are certain elements of operations which have insufficient detail in the Operation and Maintenance Manual.

## X. ᐃᐅᓕᓯᓂᑦᑲ

- ᐱᓕᓂᐃᑲᑦᑲᓂᓕ  
ᐅᑦᑲᐅᓯᓂᓴᐅᓯᓂᑦᓯᓂᑲ  
ᐃᐅᓕᓯᓂᑦᓯᓂᑦ ᐃᓕ  
ᐃᑦᑲᐅᓂᓂᓯᓂᑦᓯᓂᑦ ᓂᓕᓂᓂᓯᓂᑦ.



X.  $\triangleleft \triangleright \subset \sigma^{\circ} \rho^{\circ}$

◁▷↵↻↺↻.

- (10.1)  $\triangleright^{\text{fb}} \triangleright^{\text{f}} \neg \text{L}^{\text{f}} \neg \text{d} \Delta^{\text{f}} \text{h} \triangleright^{\text{f}} \text{L}^{\text{f}}$ ,  
 $\nabla \text{L}^{\text{f}} \text{b} \text{d}^{\text{fb}} \text{L}^{\text{f}} \neg \text{d} \Delta^{\text{f}} \text{bL}^{\text{f}} \neg \triangleright^{\text{f}} \text{d}^{\text{fb}} \text{d}^{\text{f}} \sigma^{\text{fb}} \text{f}^{\text{f}}$   
 $\nabla \Delta^{\text{f}} \neg \text{d}^{\text{f}} \text{b} \text{b}^{\text{fb}} \text{L}^{\text{f}} \text{d}^{\text{fb}} \text{d}^{\text{f}} \sigma^{\text{fb}} \text{d}^{\text{f}} \text{d}^{\text{f}} \text{d}^{\text{fb}} \sigma^{\text{fb}}$   
 $\nabla \text{d}^{\text{f}} \sigma^{\text{fb}} \text{d}^{\text{f}}$ .
- (10.2)  $\triangleright^{\text{fb}} \triangleright^{\text{f}} \neg \text{L}^{\text{f}} \neg \text{d} \Delta^{\text{f}} \text{fb} \Delta^{\text{f}} \neg \text{d}^{\text{f}} \text{L}^{\text{f}} \neg \text{d} \Delta^{\text{f}}$   
 $\nabla^{\text{f}} \text{d}^{\text{fb}} \text{L}^{\text{f}} \text{L}^{\text{f}} \Delta^{\text{f}} \text{L}^{\text{f}} \neg \text{d} \neg \text{d}^{\text{f}}$   
 $\nabla^{\text{f}} \text{d}^{\text{fb}} \text{d}^{\text{f}}$ .
- (10.3)  $\nabla \text{L}^{\text{f}} \text{d} \sigma^{\text{fb}} \text{b}^{\text{fb}} \sigma^{\text{fb}} \neg \text{L}^{\text{f}} \neg \text{d}^{\text{fb}}$   
 $\triangleright \sigma^{\text{fb}} \text{b}^{\text{fb}} \text{f}^{\text{f}} \nabla^{\text{f}} \text{f}^{\text{f}} \text{L}^{\text{f}} \neg \sigma^{\text{fb}} \text{L}^{\text{f}} \neg \text{d}^{\text{fb}} \text{b} \Delta^{\text{f}} \neg \text{f}^{\text{fb}} \text{d}^{\text{fb}}$ .
- (10.4)  $\Delta^{\text{f}} \text{L}^{\text{f}} \neg \text{d} \sigma^{\text{fb}} \neg^{\text{f}} \text{L}^{\text{f}} \text{L}^{\text{f}} \Delta^{\text{f}} \text{h}^{\text{fb}} \text{f}^{\text{f}}$   
 $\nabla^{\text{f}} \text{b}^{\text{fb}} \text{f}^{\text{f}} \text{d}^{\text{fb}} \triangleright \text{d}^{\text{fb}} \text{L}^{\text{f}} \Delta^{\text{f}} \text{L}^{\text{f}} \neg \nabla^{\text{fb}} \text{b}^{\text{fb}} \text{L}^{\text{f}}$ .



# Comment Resolution Status

ᐅᑦᑲᐅᑦᑲᑦᑲ ᐱᑦᑲᑦᑲᑦᑲ ᐱᑦᑲᑦᑲᑦᑲ ᐱᑦᑲᑦᑲᑦᑲ

Recommendation ᐱᑦᑲᑦᑲᑦᑲᐅᑦᑲᑦᑲ	Resolved ᐱᑦᑲᑦᑲᑦᑲᐅᑦᑲᑦᑲ	Commitment Pending ᐅᑦᑲᑦᑲᑦᑲᐅᑦᑲᑦᑲᐅᑦᑲᑦᑲᐅᑦᑲᑦᑲ	Unresolved ᐱᑦᑲᑦᑲᑦᑲᐅᑦᑲᑦᑲᐅᑦᑲᑦᑲ
1	1		
2		2	
3			3
4		4.1, 4.2, 4.3, 4.4	
5		5.1, 5.2	5.3
6			6
7			7.1, 7.2, 7.3, 7.4
8		8	
9			9
10	10.4	10.1, 10.2	10.3



# Conclusion

- CIRNAC has outstanding concerns and recommendations.
- CIRNAC will continue to work through the water licence application review process with the aim of protecting Nunavut's inland water resources while promoting sustainable development.







Qujannamiik

Thank you

Merci

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