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Richard Dwyer

Manager of Licensing
Nunavut Water Board
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Gjoa Haven, Nunavut
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October 17th, 2022

Re: Review of AEM's TIA Interim Dike.

Dear Richard Dwyer, the KIA had reviewed AEM's TIA Interim Dike design and construction.

Enclosed are our geotechnical engineering consultant's comments on AEM's TIA Interim Dike.

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Thank you

John Roesch, P.Eng.

Senior Hope Bay Project Officer
Kitikmeot Inuit Association, Department of Lands and Environment

Cc Wynter Kuliktana, Acting Director, KIA, Department of Lands and Environment

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TIA Interim Dike Design and Construction

KIA-NWB-01

Technical Review Comment Number	KIA-NWB-01
Subject/Topic	Need for separation of mine contact water streams in the TIA
References	Doris Tailings Impoundment Area – 2022 Interim Dike (SRK Consulting Canada Inc.), Section 1.1.
Summary of issue as derived from reference material	The document notes the purpose of the existing aqua dam and proposed interim dike is to help segregate different streams of contact water on site (such as water in the existing TIA and underground water stream).
Detailed Review Comment	The need for segregation of different mine contact waters is not clearly stated in the document. As such, the need for the dike is also unclear.
Recommendation/Request	Can AEM provide more context on the need for segregating different streams of mine contact water and thus the need for the interim dike.

KIA-NWB-02

Technical Review Comment Number	KIA-NWB-02
Subject/Topic	Potential post construction settlement and deformation of the interim dike
References	Doris Tailings Impoundment Area – 2022 Interim Dike (SRK Consulting Canada Inc.), Section 3.5 Stability Considerations.
Summary of issue as derived from reference material	A significant length of the dike will be constructed on a foundation of tailings, some of which will be several metres thick. The tailings may be saturated and frozen or thawed. The document details the results of various stability analyses completed on the proposed dike design. The document also describes the construction method of slow placement of construction materials using small scale equipment to limit deformation of the dike during construction.
Detailed Review Comment	The document does not discuss the potential for post-construction settlement of the dike or potential consequences or mitigative activities should settlement occur.
Recommendation/Request	Can AEM comment on the potential for post-construction settlement of the dike and potential consequences and mitigative activities should settlement occur.



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KIA-NWB-03

Technical Review Comment Number	KIA-NWB-03
Subject/Topic	Potential permafrost degradation in water elevation control channel
References	Doris Tailings Impoundment Area – 2022 Interim Dike (SRK Consulting Canada Inc.), Section 3.4.7. Water Elevation Control Channel.
Summary of issue as derived from reference material	A water elevation control channel will be constructed at east abutment of the interim dike to provide water level control upstream of the interim dike. The channel will be excavated into natural ground at a depth of 1.5 to 2 m. The channel width will be 5 m and the design grades of the channel will range between 0 and 0.5%.
Detailed Review Comment	Given the channel will be excavated into natural ground, permafrost conditions may be encountered. Limited fill materials are proposed to be placed in the base of the channel (0.2 m of compacted tailings overlain by non-woven geotextile overlain by 0.3 m of riprap), providing minimal thermal protection for any permafrost that may be encountered. If permafrost conditions are encountered along the channel profile, post-construction permafrost degradation may occur. Given the shallow grade of the channel profile, permafrost degradation may impact the hydraulic performance of the channel and the water level of the upstream pond.
Recommendation/Request	Can AEM comment on the potential for permafrost degradation of the channel and any potential consequences of this or possible mitigative actions should it occur.

KIA-NWB-04

Technical Review Comment Number	KIA-NWB-04
Subject/Topic	Water level upstream of interim dike, length of tailings beach at toe of South Dam
References	Doris Tailings Impoundment Area – 2022 Interim Dike (SRK Consulting Canada Inc.), Section 3.3. Dam Design.
Summary of issue as derived from reference material	The maximum elevation of the water level upstream of the interim dike will be 34.5 m. This will submerge much of the existing tailings beach at the toe of the South Dam.
Detailed Review Comment	As documented in previous project documentation, there is a minimum beach length requirement upstream of the South Dam. It is unclear if the



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	proposed maximum water level upstream of the interim dike will result in a beach length that still complies with the operational requirements.
Recommendation/Request	Can AEM comment on how the maximum water level of the pond upstream of the interim dike will impact the beach length upstream of the South Dam and if this will comply with existing minimum beach length requirements for the TIA.

KIA-NWB-05

Technical Review Comment Number	KIA-NWB-05
Subject/Topic	Trigger conditions for construction of the contingency buttress for the Interim Dike
References	Doris Tailings Impoundment Area – 2022 Interim Dike (SRK Consulting Canada Inc.), Section 3.4.8. ROQ or Waste Rock Contingency Buttress.
Summary of issue as derived from reference material	A rockfill buttress is proposed to be built at the downstream toe of the Interim Dike should poor foundation conditions be encountered during construction or during preconstruction investigative activities.
Detailed Review Comment	No information is provided in the project document that indicates what constitutes poor foundation conditions or construction observations that would trigger the construction of the buttress.
Recommendation/Request	Can AEM comment what ground conditions or construction observations would be required to trigger the construction of the buttress.