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March 5, 2019

Derek Donald
Technical Advisor
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU,
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Sent via Email: *derek.donald@nwb-oen.ca*

Re: TMAC Resources Inc. response to agency comments on the Hope Bay Project, Waste Rock, Ore and Mine Backfill Management Plan for implementation under 2AM-DOH1335, 2AM-BOS1835, and 2BB-MAE1727.

Dear Mr. Donald,

This correspondence is being provided to the Nunavut Water Board (NWB) in response to intervener comments issued on or before February 27, 2019.

TMAC received comments from the following interested parties:

1. Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)
2. Environment and Climate Change Canada (ECCC)

TMAC responses to comments are located in Attachment A of this submission.

Should you have any questions please feel free to contact me at Oliver.curran@tmacresources.com.

Sincerely,

Oliver Curran
Vice-President, Environmental Affairs TMAC Resources Inc.

Cc:
Licencing (NWB)

Kyle Conway / Sarah Warnock (TMAC)
Adam Grzegorczyk (TMAC)
Shelley Potter (TMAC)
Ashley Mathai (TMAC)

Attachments:

Attachment A: TMAC Resources Inc. Response to comments received on the 2019 Hope Bay Project, Waste Rock, Ore and Mine Backfill Management Plan

Attachment A

Hope Bay Project, Waste Rock, Ore and Mine Backfill Management Plan Comments and TMAC Response

Agency Comment	Topic	Section	Reference	Recommendation	TMAC Response
CIRNAC-1	Details of In-Place Mitigation Measures of Inappropriate Construction Material	Hope Bay Project, Waste Rock, Ore and Mine Backfill Management Plan, Version 6, TMAC Resources Inc., January 2019, Section 4.2.	The following quote referring to in-place mitigation is found on page 36: In the unlikely event that the results of the seep monitoring program or the confirmatory sampling program (Section 3.2) indicate the presence of material with an elevated potential for ML/ARD has been used in construction, further investigations will be undertaken to define the extent and assess the potential impacts of the material. If warranted, and after discussion with the appropriate regulatory agencies, the material may be mitigated in place or excavated and hauled to the waste rock stockpile for eventual disposal underground. CIRNAC seeks clarification on what in-place mitigation will entail.	CIRNAC requests further details on the actions to be taken to mitigate inappropriate construction materials, should these materials be discovered after they have been used in construction.	If the construction seepage and solids monitoring program program indicates the occurrence of inappropriate materials present (e.g. risk of ML/ARD could occur), further action would include additional characterization to delineate the volumetric extent of the inappropriate materials with subsequent monitoring to assess potential impacts. For example, if PAG material is indicated and associated seepage is neutral pH with low risk of metal leaching, monitoring will estabblish the geochemical performance of the materials. In the unlikely event that waste rock is acidic, then removal of the rock would be assessed.
CIRNAC-2	Non-mineralized Diabase as Construction Material	Hope Bay Project, Waste Rock, Ore and Mine Backfill Management Plan, Version 6, TMAC Resources Inc., January 2019, Section 3.2.	In Version 5 of the Waste Rock, Ore and Mine Backfill Management Plan, non-mineralized diabase from the Doris Project had been identified as a candidate construction material and criteria were provided for using non-mineralized diabase for construction outside of the Pollution Containment System. In Version 6, non-mineralized diabase was not mentioned.	CIRNAC requests clarification on whether non-mineralized diabase from the Doris Project will continue to be used as a construction material, and if not, the rationale behind the decision to discontinue its use.	Diabase was removed to emphasize that regardless of lithology, the flow chart process will be applied to all rock types. Based on our geological and geochemical analysis, non-mineralized diabase is still considered a good candidate.
CIRNAC-3	Figure Numbers	Hope Bay Project, Waste Rock, Ore and Mine Backfill Management Plan, Version 6, TMAC Resources Inc., January 2019, Figures.	Figure numbers are referenced in the text of the Waste Rock, Ore & Mine Backfill Management Plan, however, aside from Figure 2.1, the figure numbers referenced in text do not match the corresponding figure numbers in the Figures section.	CIRNAC recommends adding the figure numbers referenced in text to the corresponding figures to improve ease of reference	Noted - Error will be corrected in the next revision of the Management Plan which TMAC anticipates will be with the annual report submission to the NWB at the end of March 2019.
ECC-1	Detoxified Tailings Management	Waste Rock, Ore and Mine Backfill (WROMB) Management Plan - Section: 2.2.3 Detoxified Tailings	The Proponent states that, “detoxified tailings have high sulphide content and are classified as PAG [Potentially Acid Generating] (SRK 2015f and 2017d). Kinetic testing indicated that sulphate, cobalt, manganese, nickel and selenium leaching at neutral to alkaline pH conditions. The projected onset to acidity for detoxified tailings is 20 years (SRK 2015f). The residence time of detoxified tailings on surface will be less than this period; therefore, drainage from detoxified tailings is expected to be neutral to alkaline pH during operations” (Page 10). ECCC notes that the tailings are fine grained in nature, and have a high content of sulphide. Given these two properties, with the large surface areas for storage prior to use as mine backfill, it is unclear what will prevent oxidation of the sulphides in the tailings prior to the 20 years estimate before acidification sets in. It is also unclear if there are any contingency plans to mitigate Acid Rock Drainage and Metal Leaching (ARD/ML) in the case that the ARD/ML occurs earlier than projected.	ECCC recommends that the Proponent update the WROMB Management plan to provide clarification on how the onset of the acidification was determined to be 20 years and provide clarification on any contingency plans to mitigate ARD/ML should the acidification occur earlier than projected.	The 20 year prediction for onset to acidic conditions for the detoxified tailings is based on a humidity cell test (HCT) sample of Doris metallurgical detoxified tailings that developed acidic conditions after approximately 4 years of operation. The detoxfied tailngs tested were fine grained. The 20 year estimate was determined based on a scaling factor for temperature of 0.2, to adjust for temperature differences between the lab test and site conditions (SRK 2017e). Using the Arrhenius Equation and assuming pyrite is the dominant sulphide mineral, this corresponds to an average internal temperature of 1 to 4°C. Detoxified tailings are only stored on surface for days before it it backhauled underground, and furthermore per the facility design, all mine contact water is collected in contact water ponds which are dewatered to the Doris TIA.
ECC-2	Closure Management of Waste Rock and Detoxified Tailings	WROMB Management Plan - Section: 2.3.1 Management Response - Backfill	The Proponent states “at closure, there will be no all waste rock and detoxified tailings remaining on surface” (Page 13).	ECCC recommends the Proponent clarify that the waste rock and detoxified tailings will not remain on the surface after closure.	Noted - Error will be corrected in the next revision of the Management Plan to be submitted to the NWB in the next annual report (March 2019). At closure there will be no waste rock and detoxified tailings remaining on surface.