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Richard Dwyer

Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, Nunavut
X0B 1J0

July 28th, 2021

Re: Review of Emergency Discharge Pond Design Report for Back River Water Licence No: 2AM-BRP1831.

Dear Richard Dwyer, the KIA has completed its review of Sabina Gold & Silver Corp.'s Back River Emergency Discharge Pond Design Report for Water Licence No. 2AM-BRP1831.

Our geotechnical engineering consultant BGC Engineering Inc. (BGC) has provided KIA with the following comments.

Overall, BGC considers the proposed design reasonable. However, some aspects for consideration are listed below:

- With regards to the liner, it is understood that the pond will likely be empty for most of the time and therefore, the liner is directly exposed to atmospheric conditions. This will result in significant thermal loads on the liner. The design report does not provide details on the assumed thermal loads nor how those are addressed during construction.
- The Water Licence No. 2AM-BRP1831 (Part D, Item 2c) requires the Project to outline the acid rock drainage (ARD) and metal leaching (ML) characteristics of waste rock and fill anticipated to be used in construction. However, the design report discusses ARD only, without mention of ML characteristics of design criteria.
- In Section 2 on page 2-1, Sacre-Davey state "The pond facility design complies with the Water Management Plan for the Back River Project…". However, it is not clear what design compliance criteria were satisfied nor was a reference to what version/date of the Water Management Plan is being cited in this statement.
- The proposed sampling frequency used to confirm that the material is not potentially acid generating (NPAG; as defined by neutralization potential ratio (NPR) values > 3 or total S <0.15% S), is likely too low. On page 3-3, Sacre-Davey state one sample for every 100,000 tonnes material mined from NPAG areas within the quarries would undergo confirmatory sampling (for geochemical assessment). The document notes in Section 4.1 Table 2 (page 4-5) that 12,000 m^3 of fill material is estimated to be used, which would equate to only one confirmatory sample. BGC suggests the sample frequency for confirmatory sampling should allow for a statistically defensible dataset at a minimum (i.e., minimum of 3 and up to 10).

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- Section 4.2 (page 4-5) states that preliminary geochemical characterization of the Run-of- Quarry (ROQ) material to be used for construction was completed and showed a "negligible potential for ML/ARD". The same section states that further testing was conducted in 2018 and "results reported low Sulphur content and ARD potential". The document does not provide the details/data nor are references provided to support these statements.
- The description of fill material and criteria in Sections 4.2.1 to 4.2.3 (page 4-5 to 4-6) is inconsistent with the language in earlier sections, whereby these sections describe ideal material as non-acid generating material and earlier sections (e.g., Section 3.3, page 3-2) describe material as NPAG. It is unclear if these classifications reference the same geochemical criteria.
- It is not clear if Run-of-Mine (ROM) material will also be considered for construction of the emergency pond as Sacre-Davey uses "ROM (or ROQ)" in the drawing legend, but only state ROM In the detailed cross sections. If ROM is to be used, the criteria to be used to define its suitability for construction should be provided.

Finally, it is important to note that the pond overflow system will require maintenance in order to be ready if required. It is expected that snow will accumulate within the culvert. It may freeze in situ and clog the system for an extended period of the year, depending on the spring and summer temperatures. Sabina should have the capacity to steam the pipe if too much snow were to accumulate and freeze. In addition, a 600 mm culvert is proposed for the overflow system, which small for a culvert in the Arctic. However, if proper maintenance protocols are followed, this culvert size should be manageable, in particular as the whole system is only used as an emergency pond.

Conclusions

In general, BGC agrees with the proposed design, but has some concerns regarding the impacts on the liner from thermal load and the sampling of the construction materials to assess its suitability in regard to its ARD and ML potential. It is also important that the system is properly maintained so that it is functional if used during an emergency.

Thank you.

John Roesch

John Roesch, P.Eng.

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