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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

File No: **2AM-BRP1831/TR/D2, D3**

July 3, 2020

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RE: NWB Technical Review of the Echo and the Goose Neck Culvert Crossing Design Reports; Back River Project; Water Licence No: 2AM-BRP1831.

Dear Mr. Pickard and Mr. Keefe:

The Nunavut Water Board (NWB or Board) has completed its technical review of the construction design reports entitled *"Echo Culvert Crossing Detailed Report"* dated May 2020 and "*Goose Neck Culvert Crossing Detailed Report"* dated May 2020 (Design Reports) provided to the Board by Sabina Gold & Silver Corp. (Sabina or Licensee) on May 8, 2020 to fulfill the requirements of Part D, Item 2 of Water Licence No: 2AM-BRP1831 (Licence).

In its submissions, Sabina states that *"the development of the Back River Project will require a total of four stream crossings along the proposed Goose Property haul road"* and that *"the design of the crossings was first considered in the Project Feasibility Study, completed in 2015, and since then additional checks and modifications to improve constructability have been completed"*. Sabina also notes that the current Design Reports describe the Echo and the Goose Neck Crossing locations specifically and that the construction of these crossings is planned to start in 2020.

The Design Reports summarize the site conditions, design basis and key parameters adopted for design, and for-construction design drawings for the Echo and the Goose Neck Crossings, as required under Part D, Item 3 of the Licence.

Upon receipt, the submissions were distributed for a four (4) week public review with a deadline set at June 8, 2020.

On or before the deadline, the comments were received from the Kitikmeot Inuit Association (KIA) and Crown-Indigenous Relations and Northern Affairs (CIRNA). In its submission, the KIA indicated that "*they have no comments to provide to the NWB on either documents"* and that *"they are both within permitting and licensing requirements"*. CIRNA recommended that Sabina *"provide adequate typical cross sections showing end pipe protection with adequate riprap geometry"* and *"provide the missing skew angles [on the provided drawings] to confirm that the culverts can be adequately installed"*.

All correspondence relevant to these submissions is available from the NWB's FTP site using the following link:

ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-BRP1831%20Sabina/3%20TECH/D%20CONST&OPER/

On June 16, 2020, Sabina submitted updated culvert crossing drawings along with additional written responses confirming the following:

Comment #	Proponents' comments /Sabina's responses
CIRNA-1	**End pipe protection**
	Sabina is proposing a small patch of non-woven geotextile at the immediate outlet of the culvert (approximately 1-m long by 0.7-m wide) that is covered by a larger layer (larger extents) of coconut matting. This coconut matting material would be placed approximate 2.0-m beyond the culvert outlet and at least one culvert diameter in width beyond each side of the culverts. This coconut matting will help to limit erosion by still allowing the top vegetative tundra mat to live. Drawings have been updated to reflect these changes. Sabina recommends this approach as opposed to a thin layer of rip rap fill material as there's concerns that these thin layers (less than 1.5 m) could lead to deepening of the local active layer and potential increased rates of permafrost degradation at the culvert outlet. Sabina will monitor conditions at the inlet and outlet of the culvert to ensure permafrost conditions are stable immediately after construction. Sabina also notes that, as part of its Environmental Monitoring and Protection Plan (EMPP; 12BRP1831 Supporting Document [SD] 20), culverts will be visually inspected for sediment accumulation and bed erosion, as well as other blockages, barriers, or culvert defects.
CIRNA-2	**Missing skew angles**
	Sabina has updated both Echo and Goose Neck Culvert Crossing drawings to show culvert skew angles; Sabina notes that skew angles are shown relative to the approximate stream centerline on each figure. The road alignment over culvert crossings will be adjusted so skew angles are minimized as much as feasible. In addition, base slopes of culverts will be installed at 1% or greater grades, as shown on Echo-03 and GN-03. Drawings have been updated to reflect these changes.

Upon receipt, Sabina's submission was forwarded to CIRNA for confirmation of satisfaction. In correspondence[1] dated June 30, 2020, CIRNA indicated that they are satisfied with Sabina's answers.

By copy of this letter the Board acknowledges that the Design Reports address the requirements of Part D, Item 3 of Water Licence No: 2AM-BRP1831, and has accepted the Design Reports, as required by Part D, Item 2 of the Licence.

The Licensee is advised that the Board's "acceptance" of these documents is a verification that the proposed activities are consistent with the existing terms and conditions of the Licence, and more specifically with Part D, Item 3, and may proceed in accordance with the Design Reports and drawings provided. It should be noted that the Board's "acceptance" is NOT intended or offered as any representation regarding the suitability of the plans nor third party verification of the design, construction, planning or engineering discussed in the documents.

Should you have any questions, please feel free to contact the undersigned at (867) 360-6338 (extension 29) or at sergey.kuflevskiy@nwb-oen.ca, at your earliest convenience.

Sincerely,

Sergey Kuflevskiy
Technical Advisor
Nunavut Water Board

Cc: Distribution List – Back River Project

[1] Godwin Okonkwo (CIRNA) to Richard Dwyer (NWB); RE: 2AM-BRP1831 and 2BE-GOO2028; June 30, 2020.