



Water Resources Division
Resource Management Directorate
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Your file - Votre référence
2AM-BRP1831
Our file - Notre référence
GCDocs#104590031

June 28, 2022

Richard Dwyer
Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU, X0B 1J0
E-mail: licensing@nwb-oen.ca

**Re: Crown-Indigenous Relations and Northern Affairs Canada's Review of the
Annual Report for Sabina Gold and Silver Corp. Back River Project, Type A Water
Licence No. 2AM-BRP1831**

Dear Richard ,

Thank you for the April 5th, 2022 invitation to review the 2021 Annual Report on the Back River Project property, submitted by Sabina Gold and Silver Corporation's, for Type A Water Licence No. 2AM-BRP1831.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) examined the application pursuant to its mandated responsibilities under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Department of Crown-Indigenous Relations and Northern Affairs Act*. Please find CIRNAC comments and recommendations in the attached Technical Memorandum.

If there are any questions or concerns, please contact me at (867) 975-4550 or Andrew.Keim@canada.ca

Sincerely,

Andrew Keim

Andrew Keim
Regional Manager
Water Resources, Nunavut Regional Office
Crown-Indigenous Relations and Northern Affairs Canada



Technical Review Memorandum

Date: July 29, 2022

To: Richard Dwyer, Manager of Licensing, Nunavut Water Board

From: Andrew Keim, Regional Manager, CIRNAC

Subject: Crown-Indigenous Relations and Northern Affairs Canada's Review of the Annual Report for Sabina Gold and Silver Corp. Back River Project, Type A Water Licence No. 2AM-BRP1831

Region: ☒ Kitikmeot ☐ Kivalliq ☐ Qikiqtani

A. BACKGROUND

Sabina's Back River Project (the Project) is located in southwestern Nunavut, in the Kitikmeot Region. It is situated approximately 400 km southwest of Cambridge Bay, 95 km southeast of the southern end of Bathurst Inlet (Kingaok), and 520 km northeast of Yellowknife, Northwest Territories. The Project is located predominantly within the Queen Maud Gulf Watershed.

The Project is comprised of two main areas; the Maine Laydown Area (MLA) situated along the western shore of southern Bathurst Inlet and the Goose Lake Area south of the MLA where the gold deposits are located. These areas are connected seasonally by an approximately 160 km long winter ice road. The majority of annual resupply is brought in by water to the MLA and necessary materials are transferred via winter ice road to the Goose Lake property.

The MLA consists of a terminal barge, laydown area, camp facility, fuel storage, power plant, storage and maintenance facilities and is the primary staging area for shipping, receiving, and storage of equipment, fuel, material, and other supplies.

The Goose Property includes the mine site for open and underground mining of four deposits, ore stockpiles, a processing plant, tailings and waste rock storage/disposal, all-weather air strip, camp facility, fuel storage, power plant, and other associated mining facilities.

The Project's planned lifespan is reported to be 27 years, with four years of mobilization and construction, 10 years of operation, eight years of reclamation and closure, and five years of post-closure monitoring (Sabina, 2015).

Sabina applied to the Nunavut Water Board (NWB) for and was issued a Type "A" Licence under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*. The Water Licence 2AM-BRP1831 was issued on September 21, 2018, and amended on August 31, 2021.

The Water Licence outlines the specific terms and conditions for the proponent respecting the authorization to use water or deposit waste for the Project. Part B, Item 2 of Water Licence 2AM-BRP1831 requires that the proponent files an annual report on their previous year's activities by



March 31st to the NWB. Schedule B of Water Licence 2AM-BRP1831 specifies the information required in the annual report including;

- Information related to the dikes, dams and structures constructed to withhold water or waste;
- A summary report of Water use, Winter Ice Road activities, dewatering activities, and any updates to the Water and Load Balance results;
- Summaries of geochemical monitoring results, ore stockpile quantities, seepage and runoff monitoring, and waste disposal;
- A list of unauthorized discharges and a summary of follow-up actions taken;
- A summary of Modifications and/or major maintenance work carried out on all Water and Waste-related structures and facilities;
- Monitoring program results and interpretation;
- A summary of any progressive Closure and Reclamation work undertaken;
- An updated estimate of the current restoration liability;
- A summary of any studies requested by the Board that relate to Water use, Waste disposal or Reclamation, and a brief description of any future studies planned;
- Any revisions to Management Plans, reports or manuals;
- A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector;
- A summary of public consultation/participation, describing consultation with local organizations and residents of the nearby communities, if any were conducted;
- Any other details on Water use requested by the Board by the 1st November of the year being reported.

Sabina Gold and Silver Corporation, in accordance with the Type A Water Licence No. 2AM-BRP1831 provided the NWB their 2021 Annual report on April 5, 2022.

The annual report includes the following appendices:

- Appendix A NWB Annual Report Form
- Appendix B Waste Disposal
- Appendix C Monitoring Activity Overview by Station
- Appendix D Water Quality Analytical Results
- Appendix E Back River Project Engagement Record



CIRNAC retained the services of CBCL Limited (CBCL) to review Sabina Gold & Silver Corp.'s (Sabina) Back River Project 2021 Annual Report for Water Licence 2AM-BRP1831 and provide CIRNAC with Expert Engineering, Scientific, Technical and Environmental Evaluations and comments associated with Northern Development in accordance with CIRNAC's mandate.

CIRNAC has reviewed the package provided by CBCL and provides the following comments and recommendations pertaining to the application package. A summary of the subjects of recommendations can be found in Table 1. Documents reviewed as part of this submission can be found in Table 2 of Section B. Detailed technical review comments can be found in Section C.

**Table 1: Summary of Recommendations**

Recommendation Number	Subject
R-1	Use of Water
R-2	Water and Load Balance
R-3	Waste Management and Reporting
R-4	Monitoring program- Shallow Ground water monitoring
R-5	Monitoring Program – Reporting
R-6	Monitoring Program – General Monitoring
R-7	Updating of Plans, Manuals and Reports
R-8	Tailings Management Plan
R-9	Updated Waste Rock Management Plans – Locations
R-10	Updated Waste Rock Management Plans – PAG Vs Non-PAG
R-11	Updated Waste Rock Management Plans – Volumes
R-12	Updated Water Management Plan

B. DOCUMENTS REVIEWED AND REFERENCED

The following table (Table 2) provides a list of the documents reviewed under the submission and reference during the review.

Table 2: Documents Reviewed and Referenced

Document Title	Author, File No., Rev., Date
Sabina 2021 Annual Report and attached Appendixes A to E	Sabina Gold and Silver Corp, March 2022
Back River Project Tailings Management Plan	Sabina Gold and Silver Corp, April 2022
Back River Project Waste Rock Management	Sabina Gold and Silver Corp, April 2022
Back River Project 2020 Annual Report for Water Licence 2AM-BRP1831. March 2021	Sabina Gold and Silver Corp, April 2022
The Back River Project Final Environmental Impact Statement Addendum. 2017	Sabina Gold and Silver Corp, February 2017
The Back River Project Final Environmental Impact Statement. November 2015.	Sabina Gold and Silver Corp, November 2015
Goose Project Site – 2021 Annual Geotechnical Inspection.	SRK Consulting, April 4,2021
Annual Geotechnical Inspection, 2021- part 1	SRK Consulting April 2022
Annual Geotechnical Inspection, 2021- part 2	SRK Consulting , April 2022



C. RESULTS OF REVIEW

1. Use of Water

Comment:

In the 2021 Annual Report, Sabina states that “*No freshwater was withdrawn under this licence in 2021.*” Sabina further states that freshwater for use at the MLA was obtained from Bathurst Inlet, water use for the Goose Exploration Camp was reported in the annual report for the exploration licence 2BE-GOO2028, and construction of the Winter Ice Road did not occur during 2021.

It is also stated in the 2021 Annual Report that activities related to the airstrip and road network occurred at the Goose site in 2021. The amended NWB Water Licence 2BE-GOO2028 specifies that activities related to the Goose airstrip, airstrip quarry, and ice road connecting the camp to the quarry are included under Water Licence 2AM-BRP1831.

Reference:

2021 Annual Report for Water Licence 2AM-BRP1831, Pages 1-4 to 2-6 (Sabina, March 2022)

Recommendation:

(R-01) CIRNAC recommends that Sabina clarifies whether any of the activities carried out in 2021 at the Goose site, or any other Back River Project site, fall under Water Licence 2AM-BRP1831 and provide further justification for why they do not report any fresh water use under this licence. If any of the 2021 activities do fall under Water Licence 2AM-BRP1831 and involved use of fresh water, provide details on the monthly and annual volumes used from all sources.

2. Water and Load Balance

Comment:

In the 2021 Annual Report, Sabina states that it is currently updating the Water and Load Balance, and has submitted notification to the NWB in regard to this update and a submission timeline (August 2022).

Reference:

2021 Annual Report for Water Licence 2AM-BRP1831, Page 2-6 (Sabina, March 2022)
Back River Project Water Management Plan, Pages 6-1 to 6-2 (Sabina, April 2022)

Recommendation:

(R-02) CIRNAC requests that Sabina provide a summary update to the Water and Load balance results. This update was to have been provided within the timeline as set in the licence. Since the timeline has elapsed, this summary update must be provided as soon as possible.



3. Waste Management and Reporting

Comment:

Annual quantities of waste generated were not disclosed in the 2021 Annual Report, which does not meet the requirements of Schedule B General Condition (GC) #9.

In the 2021 Annual Report under Part B of Appendix A, Waste Management and/or Disposal, “Hazardous” is not checked when it appears it should have been. Table 1 of Appendix B, Waste Disposal lists hazardous wastes that were shipped offsite to KBL Environmental. The Table 1 caption does not make it clear the wastes included in this table are hazardous. Additionally, the format of this table does not comply with GC #9 as the quantities (volumes) of the shipment are not disclosed and the annual quantity of each waste type is not disclosed. Manifest numbers are listed under the dates, not in a separate column which creates confusion. There were no manifests listed for the shipment that occurred on August 17, 2021.

Under Part B, 2 Additional Details of Appendix A, NWB Annual Report Form of the 2021 Annual Report, the NWB Annual Report Form states that the reviewer should “*See Section 2.9 of this report for wastes disposed of in 2020*”. Section 2.9 of the 2021 Annual Report describes waste disposal activities occurring in 2021, not 2020. This may be a typographical error.

In Table 2 of Appendix B, Waste Disposal, of the 2021 Annual Report, the 2021 monthly waste quantities were reported in pounds (lbs) and litres (L) instead of cubic metres.

Reference:

2021 Annual Report for Water Licence 2AM-BRP1831, Page 2-10, Appendix B, Appendix A (Sabina, March 2022)

Recommendation:

(R-03) CIRNAC recommends;

- Sabina report the 2022 monthly and annual quantities of waste generated in cubic metres in the 2022 Annual Report.
- Sabina is to ensure to include in the 2022 report information on the hazardous wastes shipped off site. CIRNAC also recommends that SABINA update the format and content of Table 1 to comply with Schedule GC #9 and check the “Hazardous” box on the NWB Annual Report form if it applies. The territorial manifest number should be included in a separate column from the date, and the total waste volumes in cubic meters should be included where appropriate, not just the amount of each item per load.
- Sabina provide further information on the reason as to why there are no manifest numbers listed for the shipment that occurred on August 17, 2021.



- Sabina further ensures the NWB Annual Report Form included in the 2022 Annual Report is updated to reflect 2022 wastes.

4. Monitoring Program- Shallow Ground Water Monitoring

Comment:

In the 2021 Annual Report, mine construction activities reported were minimal in 2021, and consequently, very little monitoring data was collected or reported on in 2021. Future monitoring reports should include the baseline data in order to show the effects of mining activity (i.e., a 'before and after') comparison of water quality.

If shallow groundwater samples were collected from the active zone, this data should be presented along with other baseline data. This work is likely to require a summary of how shallow groundwater in the active zone and overburden-bedrock contact zone functions during periods of thaw

Reference:

2021 Annual Report for Water Licence 2AM-BRP1831, Pages 2-11 to 2-13 (Sabina, March 2022)

Recommendation:

(R-04) CIRNAC recommends that in the 2022 Annual Report and future annual reports, Sabina:

- Compile all available (current and historical) water quality data compared to applicable criteria in tabular format (Excel spreadsheet) to summarize pre-construction conditions.
- Identify which baseline stations correspond to the proposed effects monitoring stations shown in the most recent Water Management Plan.
- If no baseline data has been collected from relevant stations since 2015, provide an explanation as to why. If possible Sabina should take such steps as are necessary to resume sampling for the 2022 monitoring year.
- Include a discussion of how shallow flow zones in the active zone will be monitored for future impacts, specifically in zones directly adjacent to the active pits and the Waste Rock Storage Areas (WSRA).
- Include mapping of sandy seams or vertically and horizontally extensive sandy units, based on borehole lithology. If there are no shallow flow zones, present evidence from the borehole lithologies.

5. Monitoring Program – Reporting

Comment:

In the 2021 Annual Report, the field reading for pH is provided for the berm discharge water quality results; this pH reading is within the acceptable range of 6.0 – 9.5. The laboratory pH was reported to be 5.57 (i.e., outside of the acceptable range). The pH reported for the runoff water quality is the laboratory result (6.67), which is in the acceptable range and the field reading is not included.



Reference:

2021 Annual Report for Water Licence 2AM-BRP1831, Page 2-11 (Sabina, March 2022)

Recommendation:

(R-05) CIRNAC recommends that in the 2022 Annual Report and future annual reports, Sabina provide both the field readings and laboratory pH results in the water quality results tables (similar to the 2020 Annual Report).

6. Monitoring Program – General Monitoring

Comment:

In the 2021 Annual Report, Sabina states that aquatic effects monitoring has not yet commenced at the Back River Project. Sabina's 2017 Environmental Management and Protection Plan commits to general monitoring, which is defined as covering "*all types of monitoring*". In the 2021 Annual Report, Sabina does not report on general monitoring conducted in 2021.

Reference:

- 2021 Annual Report for Water Licence 2AM-BRP1831, Page 2-12 (Sabina, March 2022)
- Back River Project Aquatic Effects Management Plan (Sabina, October 2017)
- Back River Project Environmental Management and Protection Plan (Sabina, October 2017)

Recommendation:

(R-06) CIRNAC recommends that Sabina:

- Clarify whether any general monitoring was conducted in 2021.
 - If general monitoring was not conducted, provide a rationale, if general monitoring was conducted, provide the results to the NWB.
- Provide the results of general monitoring in future annual reports.

7. Updating of Plans, Manuals and Reports

Comment:

Sabina stated in the 2021 Annual Report to the NIRB that "*Sabina recently reviewed the plan [referring to the 2017 Landfill Waste Management Plan] and determined that an update would be beneficial to address current practices at the Back River Project. Once completed, the updated LWMP will be submitted to the NWB for approval and will then be submitted to the NIRB.*"

There is no mention of these proposed updates to the Landfill Waste Management Plan, including any indication of an anticipated submission timeline, in the 2021 Annual Report for Water Licence 2AM-BRP1831.



Reference:

2021 Annual Report for Water Licence 2AM-BRP1831, Page 2-13 (Sabina, March 2022)

Recommendation:

(R-07) CIRNAC recommends that Sabina provide a timeline for the anticipated submission of the updated Landfill and Waste Management Plan to the NWB.

8. Tailings Management Plan

Comment:

Table 8-1 in the Tailings Management Plan (TMP) states that “...*additional capacity is available in the open pits to accommodate greater volumes of tailings*”.

It is not clear how much additional volume is available or whether a greater than expected volume of tailings will negatively impact the 5 m of water cover required to prevent the resuspension of solids.

It is noted that the tailings volumes for the Echo and Umwelt Tailings Facilities are near or above the depth-area-capacity curves of the pits as outlined in the 2021 Updated Feasibility Study.

Reference:

- Back River Project Tailings Management Plan, Pages 5-1 to 5-3 and 8-1 (Sabina, April 2022)
- Updated Feasibility Study for the Goose Project, Pages 20-19 to 20-20 (Sabina, March 2021)

Recommendation:

(R-08) CIRNAC recommends that Sabina provide the volumes or depth-area-capacity curves of the mined-out open pits in future TMPs.

9. Updated Waste Rock Management Plans – Locations

Comment:

The location of the Echo/Goose Waste Rock Storage Area is unclear. On page 5-1 of the Waste Rock Management Plan, it is listed as being “*Located in directly adjacent to the Echo open pit mine*”, while on Page 5-7 the location is stated to be “...*on top of the mined-out Echo Pit once it is no longer in use*”.

Reference:

Back River Project Waste Rock Management Plan, Pages 5-1, 5-7 (Sabina, April 2022)

Recommendation:



(R-09) CIRNAC recommends that Sabina provide clarification on the location of the Echo/Goose WRSA in future Annual Report

10. Updated Waste Rock Management Plans -PAG Vs Non-PAG

Comment:

Table 5.3-2 outlines the quantities and proportions of PAG and NPAG waste rock within each pit. The Echo open pit is not listed. Has the waste rock from the Echo Deposit been tested and classified for ARD potential? Is the distribution expected to be similar to the Goose open pit?

Densities for the NPAG vs PAG waste rock are not given. What is the PAG to NPAG distribution by volume?

Reference:

Back River Project Waste Rock Management Plan, Page 5-5 (Sabina, April 2022)

Recommendation:

(R-10) CIRNAC recommends that Sabina:

- Provide NPAG and PAG distributions for the Echo open pit.
- Provide densities or PAG to NPAG distributions by volume for each deposit.

11. Updated Waste Rock Management Plans – Volumes

Comment:

The Waste Rock Management Plan (WRMP) gives the expected areas and heights of each Waste Rock Storage Area (WRSA) but does not include the stockpile volumes.

Once waste rock starts being produced, as-built WRSA volumes are required to be submitted. Including the expected volumes for each WRSA would be beneficial for comparative purposes.

Reference:

Back River Project Waste Rock Management Plan, Page 5-6 (Sabina, April 2022)

Recommendation:

(R-11) CIRNAC recommends that Sabina provide volumes for each WRSA in the future WRMPs.

12. Updated Water Management Plan

Comment:

Sabina provided an updated Water Management Plan in April 2022. The updated Water Management Plan provides a figure showing the proposed general water quality monitoring stations and refers to the following documents for details on the General and Aquatic Effects Monitoring Program: Environmental Management and Protection Plan (EMPP), Aquatic



Effects Management Plan (AEMP), and the Quality Assurance/Quality Control Plan (QA/QCP).

The EMPP refers to Appendix B of the Water Management Plan for a summary of water quality monitoring for the project. The previous (October 2020) Water Management Plan included an overview of the water quality monitoring with the locations, types of monitoring, and frequency of monitoring. This information has not been updated or included in the April 2022 updated Water Management Plan submitted by Sabina. The October 2017 AEMP provides details on water quality monitoring at only a subset of the monitoring stations that are shown in the Water Management Plan. The QA/QCP does not provide details on locations, frequency or type of monitoring.

If the 2022 updated Water Management Plan replaces the 2020 version, details on the complete water quality monitoring program will be missing.

Reference:

- 2022 Back River Project Water Management Plan (Sabina, April 2022)
- Back River Project Water Management Plan, Appendix B (Sabina, October 2020)
- Back River Project Aquatic Effects Management Plan (Sabina, October 2017)
- Back River Project Environmental Management and Protection Plan (Sabina, October 2017)
- Back River Project Quality Assurance / Quality Control Plan (Sabina, October 2017)

Recommendation:

(R-12) CIRNAC recommends that Sabina provide details on the complete water quality monitoring program, updated as appropriate, in the updated Water Management Plan.