BACK RIVER PROJECT
Responses to 2021 Annual Report Comments

28 September 2022

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APPENDICES

1. Introduction

Sabina Gold & Silver Corp. (Sabina), submitted its 2021 Annual Report to the Nunavut Water Board (NWB) on 4 April 2022, as required by the Back River Gold Mine Project Certificate No. 007. Interested Parties were then requested by the NWB to provide comments on the 2021 Annual Report.

On 30 June 2022, the NWB received comments from the following interested parties:

- Kitikmeot Inuit Association (KIA) = 11 comments
- Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) = 12 comments
- Environment and Climate Change Canada = 3 comments
- Nunavut Water Board (NWB) = 1 comment

2. Responses to Comments

2.1 RESPONSE TO KITIKMEOT INUIT ASSOCIATION

KIA-NWB-1: Comparisons to previously collected baselines.

References:

Back River Project 2021 Annual Report for Water Licence 2AM-BRP1831

Section 2.6: Geochemical Monitoring Results

Section 2.14: Results of Monitoring related to the General and Aquatic Effects Monitoring Program

Back River Project Water Management Plan

Section 10: Monitoring Program

Summary:

There is a lack of comparison to previous baselines for geochemical, water quality, and AEMP monitoring.

Detailed Review Comment

Section 2.6 of the report states that "Geochemical outcomes and observations were as anticipated based on the geochemical characterization baseline studies completed during the Project assessment.".

In Section 2.14, it states that "Aquatic effects monitoring has not yet commenced at the Back River Project. However, baseline data continues to be collected in support of the AEMP program and once complied this information will be submitted to the NWB.".

Water Management Plan; Section 10: "Sabina has completed the commitment to collect additional baseline water quality data to characterize the lakes and streams within the freshwater aquatic environment prior to Construction, and Sabina has used this data to update the Water and Load Balance model to account for potential seasonal variation".

Additional information should be given regarding what comparisons were made between previously collected baseline data and 2021 data, as well as any differences (if any) that were observed between previous baseline data and 2021 data. It is not clear from the Annual Report whether there has been sufficient discussion of these results.

KIA-TC-04. The KIA also previously submitted a comment on the low sample sizes and distance bins for each site (especially MLA) during review of the 2020 Annual Report (KIA-27). It is unclear how Sabina will meet their statistical objectives for the Vegetation Monitoring Program with their limited plot selection.

Recommendation/Request:

The proponent should include comparisons between previously collected baseline data and data collected in 2021. Any differences observed between 2021 data and site conditions prior to Sabina's presence should be described to better determine whether ongoing activities at site are influencing the aquatic environment. This will ensure an appropriate determination of the baseline and associated natural variation when further project development occurs.

Importance of Issue:

High.

Sabina Response:

Monitoring data with respect to the geochemical analysis on site related to roads, quarries, and construction material is provided in Section 2.6 of the current Annual Report. Sabina confirms that geochemical characterization was initiated in 2021 at the Project site. Sabina will provide a more detailed comparison against 2021 data in the next Annual Report based on information gathered in 2022.

Additional environmental baseline data were collected in 2021, which included the following:

- Water quality data during the ice-cover and open-water seasons in Goose Lake, Reference B Lake, and Propeller Lake.
- Water quality data during the open-water season, including during freshet, at several inflows and outflows of Goose Lake.
- Sediment quality and benthic invertebrate community data in Propeller Lake.
- Fish health and tissue chemistry (mercury) data in Lake Trout from Goose Lake and Propeller Lake.
- Fish health and tissue chemistry (metals) data in Slimy Sculpin from Propeller Lake.

These baseline data are provided in the 2021 Aquatic Baseline Report (Golder 2022).

As part of the continuing effort to establish a baseline for the Aquatic Effects Management Plan (AEMP), the recently collected 2021 data will be added to the baseline dataset (compiled to date) that is being developed to support data interpretation in future AEMPs. In addition, the 2021 water quality data were incorporated into the recently submitted updated Water and Load Balance Model and Hydrodynamic Model for Goose Lake (Sabina 2022).

As noted in Section 2.14 of the 2021 Annual Report, the AEMP has not yet commenced at the Back River Project; the AEMP will be triggered with the onset of dewatering in the last year of Construction (i.e., Year -1) and Sabina confirmed the Project is currently in the first year of Construction (i.e., Year -3). To date, there has been no discharge to the aquatic receiving environment.

In the 2021 baseline year, water quality in Goose Lake and its inflows and outflows was generally consistent with previous baseline years, with no obvious indication that the limited construction activities on site in 2021 effected surface water quality in Goose Lake. Baseline conditions for the AEMP are still being characterized and some variability is expected within the baseline dataset, which multiple years of baseline data collection serve to characterize.

References:

Golder (Golder Associates Ltd.). 2022. Sabina Gold & Silver Corp. Back River Project - 2021 Aquatic Baseline Report. 21505757-116-Rev0-17000-2021_Aquatic_Baseline_Report 07JUN_22. 7 June 2022.

Sabina (Sabina Gold & Silver Corp.). 2022. Back River Project Water and Load Balance. Submitted to the Nunavut Water Board. 30 August 2022.

KIA-NWB-2: Water Quality Results for Marine Laydown Area (MLA) discharge to marine environment.

References:

Back River Project 2021 Annual Report for Water Licence 2AM-BRP1831

Appendix D: Water Quality Analytical Results

Summary:

There is a lack of interpretation of data presented for water quality results found in the Analytical Summary Tables.

Detailed Review Comment

Water quality results for the MLA discharge are provided in Appendix D, but water quality objectives/guidelines for comparison have not been provided.

Additionally, samples collected for MLA discharge are labeled “DESAL IN” and “DESAL OUT”, however, no interpretations of the data are provided. A summary of results and implications in the annual report in conjunction with the Analytical Summary Tables would be useful, rather than just the summary tables.

Recommendation/Request:

While discharges into the marine environment are outside the Water Board’s jurisdiction, applicable water quality objectives/guidelines should be included in Appendix D to assist reviewers in identifying exceedances.

Similarly, a results summary / discussion for water quality monitoring around the MLA could be included in future annual reporting to provide clarity and ease of review as there exists the potential for interactions with the local freshwater receiving environment.

Importance of Issue:

Moderate.

Sabina Response:

As noted by the KIA, the marine environment is not within the NWB jurisdiction, therefore the Licence does not contain prescribed desalination sampling or discharge criteria. As a result, desalination analytical results were provided without a comparison to Licence criteria. Desalination results were however additionally reported in Sabina's Annual Report to the NIRB, where a comparison was made between intake and discharge salinity and the commitment that discharge salinity be within 10% of intake salinity.

KIA-NWB-03: Implementation of Geotechnical inspection recommendations.

References:

2021 Annual Geotechnical Inspection

Summary:

Adoption of geotechnical inspection recommendations will further limit potential impacts on the aquatic environment.

Detailed Review Comment

Recommendations provided by the 2021 Geotechnical Inspection include:

"From a performance and geotechnical point, a closer review of what has been installed at the Echo Creek crossing, and the temporary measures at the Goose Neck crossing is suggested. Some tension cracking was seen near the shoulders of the road adjacent to, and that will ultimately become part of, the future Camp Pad Pond. Sabina should consider near-term widening and/or additional fill placement (increased thickness) at that camp pad pond road section. From a safety point of view, close monitoring of the Goose Airstrip remains a top priority.".

"Water was observed to be ponding on the southwestern boundary of the airstrip. Water appears to be flowing northeast from the adjacent natural water bodies.".

"Some attempt was made to dissipate the flow at the outlet of the culverts by placement of larger, approximately 0.3m to 0.5m, boulders at the outlets in areas. This may not be sufficient to prevent erosion of the tundra, an appropriate design should be considered. The outlet areas of the culverts should continue to be visually monitored and revisited as part of the 2022 AGI.".

"The maximum active layer thickness occurs around August at the end of the summer season. All road and pad shoulders are at their most vulnerable during this period as the thermal protection at these shoulders are less than the minimum required (by standard geometry), resulting in localized deepening of the active layer. As a result, tension cracks and general softening are most prevalent at the shoulders (outer sides). Sabina should take special precautions to limit vehicle traffic within 1 m from all shoulders.".

Therefore, as advised in the 2021 Geotechnical Inspection, the following actions should be taken in 2022:

- Widening and/or additional fill placement at camp pad pond road section.
- Additional water management measures are implemented, given that current conditions may lead to permafrost degradation if not addressed (water pooling at southwest boundary).
- Ensure that boulders at the outlet of culverts are sufficient and working to prevent tundra erosion.
- Ensure that vehicular traffic is limited within 1 m of all shoulders.

We note that adoption of these recommendations will further assist in limiting potential interactions with the aquatic environment by limiting erosion and the mobilization of road sediment.

Recommendation/Request:

Provide an update on the status of implementing the recommendations made in the 2021 Annual Geotechnical Inspection in the next annual report. The 2021 Geotechnical Inspection advised that the following should be implemented in 2022: Increasing the thickness of camp pad and pond road section of concern; Implementation of additional water management measures to address concerns with water pooling at southwest boundary; Ensure the sufficiency of builders at culvert outlets in preventing erosion; and limiting of vehicle traffic 1 m from shoulders.

Importance of Issue:

Moderate.

Sabina Response:

Sabina will provide an update on the status of implementing recommendations made in the 2021 Annual Geotechnical Inspection in the next annual report.

KIA-NWB-4: Waste rock seepage and runoff.

References:

Back River Project Waste Rock Management Plan

Section 6: Environmental Protection Measures

Summary:

The Waste Rock Management Plan is vague on measures to manage waste rock seepage and runoff.

Detailed Review Comment

"Prior to closure of WRSAs, seepage and runoff are expected to contain elevated levels of some parameters, as such, all WRSA seepage and runoff will be collected in perimeter berms and directed to collection ponds.".

"During Operations, runoff from the WRSAs at the Goose Property will be pumped to the active Tailings Facility and treated as necessary prior to discharge; any discharge locations will be located so as to limit the potential for erosion.".

This section of the Waste Rock Management Plan appears to be vague in its description of what considerations will be kept in mind when the Project is in operation. While we understand the project is somewhat in a state of flux with several details not yet finalized, the discharge location selected to limit erosion, parameters that will be monitored in seepage and runoff, and the approach to treatment if necessary do not appear to be well defined.

Recommendation/Request:

Please include additional detail in future iterations of the Waste Rock Management Plan which should be appended to next year's annual report. Specific details should include parameters that will be monitored in seepage and runoff, response plans to exceedances/water treatment protocols, and the rationale behind the selection of discharge location(s). More specific actions that will be taken to ensure environmental protection (i.e., specific location of discharges, contaminants of concern that will be monitored in seepage and runoff, and treatment/removal of residuals and their eventual fate) should also be included.

Importance of Issue:

High.

Sabina Response:

On 30 August 2022, Sabina submitted the updated Water and Load Balance Report that accounts for waste rock management, including seepage and runoff management and treatment approach. This updated modelling is currently under review by the Nunavut Water Board (NWB) and interested parties.

Sabina will complete updates in the next iteration of the Waste Rock Management Plan (WRMP), triggered by Part B, Item 16 of the Type A Water Licence (2AM-BRP1831, Amendment No. 1) as an addendum to the Annual Report (March 2023) or as directed by the Nunavut Water Board.

Further, Sabina recognizes that several iterations of modelling will be done prior to discharge locations being finalized and discharge occurring to meet criteria in the Type A Water Licence.

KIA-NWB-5: Discharge of plant contact water to tundra.

References:

Back River Project Water Management Plan

Table 5.2-3 Mine Development Sequence

Summary:

No water quality standards for tundra discharge are presented.

Detailed Review Comment

"Contact water from the Plant site is collected in the Plant site pond, then released to the tundra.".

It is unclear where or how specifically this contact water will be discharged to the tundra. The water quality standards for the release of contact water directly to the tundra should be provided, as well as an evaluation of the environmental effects of discharging contact water to the tundra.

Recommendation/Request:

As the environmental effects of tundra discharge did not appear to be evaluated in the Water Management Plan, future reporting should include more information on the safe and regulated release of contact water from the Plant site pond to the tundra to ensure that additional mitigation measures are not required.

Importance of Issue:

High.

Sabina Response:

The water quality in the Process Plant Pond is expected to be relatively benign (as confirmed by the water quality predictions in the recent Water and Load Balance model [Sabina 2022]), with potentially only some occasionally elevated TSS concentrations. Spill containment measures will be implemented within the Process Plant area to reduce the risk of contaminants reaching the pond as outlined in the Spill Contingency Plan. Sabina notes that the Type A Water Licence (2AM-BRP1831, Amendment No. 1) specifies regulated discharge criteria that must be met for discharge to the tundra (i.e., Part D, Item 21, Part F, Item 12); Sabina will comply with all discharge criteria, including those applicable to discharge to the tundra.

References:

Sabina (Sabina Gold & Silver Corp.). 2022. Back River Project Water and Load Balance. Submitted to the Nunavut Water Board. 30 August 2022.

KIA-NWB-6: Adaptive management actions for breaching of infrastructure.

References:

Back River Project Water Management Plan

Section 6: Water Modelling and Design Criteria

Summary:

No adaptive management actions are provided for breaching of high-risk infrastructure.

Detailed Review Comment

"Infrastructure which has the potential to overtop/breach and discharge to the downstream environment was assigned a "High Risk". At the Goose Property, this includes the Llama WRSA Pond, Ore Stockpile Pond, SWP, and Echo/Goose Main WRSA Pond.".

The actions that will be taken if these infrastructures are breached are not clearly defined in the Water Management Plan.

Recommendation/Request:

Response plans/mitigation strategies for a potential overtop/breach of the Llama WRSA Pond, Ore Stockpile Pond, Saline Water Pond (SWP), and Echo and Goose Main WRSA Pond should be provided in the Adaptive Management section of this document (Section 12).

Importance of Issue:

High.

Sabina Response:

Sabina will include details on response plans/mitigation strategies for a potential overtop of the Llama WRSA Pond, Ore Stockpile Pond, Saline Water Pond (SWP), and Echo and Goose Main WRSA Pond, as required, in the Engineering Design Report for these structures that is required as per the Type A Water Licence (2AM-BRP1831, Amendment No. 1) and submit 60 days in advance of construction.

KIA-NWB-07: Discrepancies Between WRMP and ICRP.

References:

Waste Rock Management Plan

Summary:

An updated waste rock management plan (WRMP) was presented in consideration of all applicable guidelines and requirements, including those of the Type A Water Licence, 2AM-BRP1831, and Project Certificate, No. 007. This revision specifically addresses commitments made by Sabina during the technical review of the amendment application for NWB Water Licence 2AM-BRP1831.

Detailed Review Comment

KIA noted discrepancies between waste rock and overburden volumes reported in the WRMP compared to those presented in the Interim Closure and Reclamation Plan (ICRP) presented by Sabina in July 2021. Table 4.3-2 of the ICRP reports a total of 6.5 Mt Overburden, 86.6 Mt Waste Rock and 12.4 Mt Tailings. These quantities differ from the 99.9 Mt Waste Rock and 6.5 Mt NPAG Overburden reported in Section 5.1 of the WRMP, which also do not add up to the reported total of 105.7 Mt.

Similarly, Section 5.4.1.1 of the WRMP reports that the Umwelt Waste Rock Storage Area (WRSA) occupies an area of approximately 33 ha, whereas the ICRP reports an area of 28.2 ha (Table 4.3-3). The area reported for the Llama WRSA are similar in both documents, but discrepancies are noted for Echo/Goose where the WRMP reports an area of 106.7 ha, even though the mine plan used for the ICRP has changed substantially.

Recommendation/Request:

Sabina should clarify and update the volumes / areas of the waste rock and overburden as per the latest mine plan that was used in the development of the July 2021 ICRP.

Importance of Issue:

Moderate.

Sabina Response:

Sabina confirms that the volumes and areas of waste rock and overburden in the July 2021 Interim Closure and Reclamation Plan (ICRP) are accurate based on the mine plan that was used to develop the management plan. Sabina also confirms that, as part of the recent updated Water and Load Balance Report and Hydrodynamic Model for the Project, an updated mine plan was employed for the April 2022 Waste Rock Management Plan.

Sabina will complete updates to the volumes and areas of the waste rock storage areas, as appropriate, in the next iteration of the ICRP, triggered by Part B, Item 16 of the Type A Water Licence (2AM-BRP1831, Amendment No. 1) as an addendum to the Annual Report (March 2023).

KIA-NWB-08: Frozen PAG Rock.

References:

Waste Rock Management Plan

Summary:

No modeling shows the long-term stability of frozen PAG rock.

Detailed Review Comment

In Section 6.1 of the WRMP, Sabina reports that *"PAG rock will become fully frozen and inactive following closure"*. The thermal modelling provided supports this design concept. However, no modelling is available that shows the long-term stability of the frozen PAG rock under most recent climate projections (CMIP6).

Recommendation/Request:

Sabina should confirm the long-term (post closure) stability of the frozen PAG rock under conservative climate change projections, using the most recent climate models (CMIP6). It is further suggested that Sabina presents scenario-based evaluation that show under what climate conditions the PAG rock may no longer remain frozen. This evaluation would help identifying the resilience of the proposed solution against climate change.

Importance of Issue:

Moderate.

Sabina Response:

Thermal analyses were conducted to estimate the thermal regime of the Waste Rock Storage Areas (WRSAs) and foundations during Operations and after Closure with multiple sensitivity scenarios and consideration of climate change as part of the Type A Water Licence Application (2AM-BRP1831, Appendix F-3). Freeze encapsulation of PAG rock was predicted to be less than 5 years in duration for the assumed base case model.

Sabina confirms that long-term thermal analyses were also completed using a 5 m NPAG waste rock representing a thermal conduction cover constructed at Closure. The model cases run to the year 2100 with consideration of climate change. The increase in air temperature due to climate change results in general warming of the waste rock and deepening of the active layer over time, as expected (2AM-BRP1831, Appendix F-3). Frozen conditions were predicted to reasonably be sustained based on conservative climate model inputs available at the time (2AM-BRP1831, Appendix F-3). The thermal analysis considered earlier climate change models from the first five Intergovernmental Panel for Climate Change (IPCC) Assessment Reports (i.e., AR1 through AR5) that were available at the time. The climate change model outputs from AR1 through AR5 remain valid today, despite more recent climate change model results included under AR6 (i.e., CMIP6 models). Climate change models vary in the underlying physics, assumptions, and overall complexity of the model, which has varied through time with further understanding of climate change and earth processes. No one climate change model, whether released as part of AR1 or AR6, can be evaluated as being superior to another. Sabina's approach has been to equally consider all IPCC accepted climate change model results to ensure a transparent and unbiased application of the models.

KIA-NWB-09: Discrepancies Between WMP and ICRP.

References:

Water Management Plan

Summary:

An updated water management plan (WMP), Version 4, was presented in April 2022 that reintegrates Llama Underground, Goose Main Underground, Echo Open Pit, and Echo Underground into the mine plan and omits the Tailing Storage Facility (TSF), the Umwelt Waste Rock Storage Area (WRSA) Containment Dam, and Umwelt WRSA Diversion Berm.

Detailed Review Comment

KIA noted discrepancies in mine waste (Table 5.2-4) and waste rock storage area (Table 5.2-5) reported in the WMP compared to the ICRP from July 2021 and the WRMP.

Recommendation/Request:

Sabina should clarify and update the volumes/areas of the mine waste and storage areas as per the latest mine plan that was used in the development of the July 2021 ICRP.

Importance of Issue:

Moderate.

Sabina Response:

Sabina confirms that the volumes and areas of waste rock and overburden in the July 2021 ICRP (Sabina 2021) are accurate based on the mine plan that was used to develop the management plan (Sabina 2022a). Sabina also confirms that, as part of the recent updated hydrodynamic and water and load balance work for the Project, an updated mine plan was employed for the April 2022 Water Management Plan.

Sabina will complete updates to the volumes and areas of the waste rock storage areas, as appropriate, in the next iteration of the ICRP, triggered by Part B, Item 16 of the Type A Water Licence (2AM-BRP1831, Amendment No. 1) as an addendum to the Annual Report (March 2023), and the Water Management Plan (WMP) as directed by the Nunavut Water Board based on the current regulator review of the Water and Load Balance Report and Hydrodynamic Model (Sabina 2022b).

References:

Sabina (Sabina Gold & Silver Corp). 2021. BACK RIVER PROJECT Interim Closure and Reclamation Plan. Submitted to the Nunavut Water Board. July 2021.

Sabina. 2022a. BACK RIVER PROJECT Waste Rock Management Plan, Submitted to the Nunavut Water Board. April 2022.

Sabina. 2022b. Back River Project Water and Load Balance. Submitted to the Nunavut Water Board. 30 August 2022.

KIA-NWB-10: Design Flow.

References:

Water Management Plan

Summary:

Culvert design criteria needs to consider new climate change models and improved projection of rainfall.

Detailed Review Comment

Table 6.2-4. of the WMP provides culvert design criteria. It is understood that the event return period for culverts will be based on a location specific risk assessment and wherever practical, a 100-year design event will be adopted. Considering that new climate change models and improved projections are available it is unclear if the 24-hour total rainfall volumes selected are still representative for the specific return periods used in the original design.

Recommendation/Request:

Sabina should confirm that the selected design values are still valid for the design return period considering better understanding of local hydrology and improved climate change models.

Importance of Issue:

High.

Sabina Response:

The 24-hour duration storm depths used for sizing the culverts account for the Project-specific climate change predictions available at the time of preparation of the Water Management Plan. The Project-specific climate change predictions will be reviewed, and updated as required, to support the final design of the culverts. Sabina will include details on the event return period, as appropriate, in the Engineering Design Report for these culverts that is required to be submitted 60 days in advance of construction as per the Type A Water Licence (2AM-BRP1831, Amendment No. 1).

KIA-NWB-11: Discrepancies Between TMP and ICRP.

References:

Tailings Management Plan

Summary:

An updated tailings management plan (TMP) was presented in April 2022 that specifically addresses commitments made by Sabina during the technical review of the amendment application for Water Licence 2AM-BRP1831.

Detailed Review Comment

KIA noted discrepancies in the estimation of tailings volumes and deposition time presented in Section 5.1 of the TMP compared to Section 4.3.2 of the approved ICRP.

Recommendation/Request:

Sabina should clarify and update the tailings deposition approximation as per the latest mine plan that was used in the development of the July 2021 ICRP.

Importance of Issue:

Moderate.

Sabina Response:

Sabina confirms that the tailings deposition outlined in the July 2021 Interim Closure and Reclamation Plan (ICRP) is accurate based on the mine plan that was used to develop the management plan. Sabina also confirms that, as part of the recent updated Water and Load Balance Report and Hydrodynamic Model for the Project, an updated mine plan, including the timing of tailings deposition, was employed for the April 2022 Tailings Management Plan.

Sabina will complete updates to the tailings deposition timing, as appropriate, in the next iteration of the ICRP, triggered by Part B, Item 16 of the Type A Water Licence (2AM-BRP1831, Amendment No. 1) as an addendum to the Annual Report (March 2023).

2.2 RESPONSE TO CROWN-INDIGENOUS RELATIONS AND NORTHERN AFFAIRS CANADA

CIRNAC-#R-01: Use of Water.

References:

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

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 2BEGOO2028 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.

Recommendation:

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 2AMBRP1831 and involved use of fresh water, provide details on the monthly and annual volumes used from all sources.

Sabina Response:

Freshwater use from Goose Lake was reported under the Goose exploration water licence 2BE-GOO2028 as exploration facilities are still in use, namely the Goose exploration camp and associated water withdrawal and discharge infrastructure.

Sabina intends to switch to reporting water use under the Type A Water Licence as each mine facility is commissioned, including the mine's camp water uptake line and sewage treatment plant. In the interim, Sabina has continued to report all water uses transparently under the most appropriate water licence, depending on the infrastructure in use (exploration vs mine), rather than double reporting this use. All data are available publicly on the NWB registry and the 2021 2AM-BRP1831 Annual Report clearly directs readers to Sabina's 2BE-GOO2028 Annual Report for water quantities used at Goose Exploration Camp. Additionally, as this information is reported under the Type B exploration water licence both reporting and compliance is held to the significantly more restrictive Type B requirements related to camp water use, which include daily (rather than monthly for Type A) tracking of water usage, daily (rather than annual for Type A) water use allotments, and a lower overall water allocation.

Although this seemed the most logical and transparent way to report under these overlapping licences, Sabina is aware this is the not the only way it could be done. If CIRNAC would prefer that water use be reported under the Type A Annual Report Sabina can make this change in the 2022 Annual Report.

CIRNAC-#R-02: Water and Load Balance.

References:

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)

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).

Recommendation:

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.

Sabina Response:

Sabina confirms that the updated Back River Project Water and Load Balance Report (Sabina 2022) were submitted to the NWB for consideration on August 30, 2022. Sabina acknowledges that summary of the Water and Load Balance in the 2022 Annual report due is in March 2023 (Type A Water Licence 2AM-BPR1831, Amendment No.1, Schedule B, Item 5) and looks forward to receiving any review comments on that submission.

References:

Sabina (Sabina Gold & Silver Corp.). 2022. Back River Project Water and Load Balance. Submitted to the Nunavut Water Board. 30 August 2022.

CIRNAC-#R-03: Waste Management and Reporting.

References:

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

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 17 August 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.

Recommendation:

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 metres 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 17 August 2021.
- Sabina further ensures the NWB Annual Report Form included in the 2022 Annual Report is updated to reflect 2022 wastes.

Sabina Response:

Sabina will adopt these recommended changes in the 2022 Annual Report and will ensure the report form indicates 2022 wastes. It is noted that many wastes are more amenable to tracking by weight or quantity (e.g., lead-acid batteries, fire extinguishers, drums of scrap steel or other wastes, tires, etc.) and volume estimates are not as easily obtained or potentially as appropriate.

Sabina has also looked into the 2021 backhaul data reported and found errors that are now corrected in a revision to Table 1 of the 2021 Annual Report below. Corrections include removal of backhaul load dated 17 August 2022 (which was a duplication of the 14 May 2022 backhaul) and the inclusion backhaul loads received 17 September and 17 December. Sabina has also separated the date and manifest number into separate columns as recommended by CIRNAC.

Table 1. [Corrected] Quantities Shipped Off Site to KBL Environmental in 2021

Date Received	Manifest #	Waste Stream	Qty
05-14-2021	NT19833-2	BATTERIES - LEAD ACID - EACH	13
		COMPRESSED GAS - FIRE EXTINGUISHER - EACH	2
05-14-2021	NT19835-7	BATTERIES - LEAD ACID - EACH	16
		BATTERIES - NON SPILLABLE- EACH	1
07-31-2021	NT23519-1	FLAMMABLE LIQUID - FUEL - DRUM	7
		WASTE LEACHATE OIL - DRUM	2
		INCINERATOR ASH - DRUM	36
		SCRAP METAL - DRUM	3
09-17-2021	NT17625-4	INCINERATOR ASH - DRUM	16
		METAL FILTER - DRUM	1
		NON-REG SOLID - WHITE GOODS - EACH	1
		FLAMMABLE LIQUID - FUEL - DRUM	19
		WATER CONTAMINATED WITH HYDROCARBONS - DRUM	1
12-17-2021	NT23946-6	BATTERIES - LEAD ACID - EACH	12
		FLAMMABLE LIQUIDS - FUEL - DRUM	5
		WASTE LEACHATE - GLYCOL -DRUM	2
		WASTE LEACHATE - MIX -DRUM	3
		WASTE LEACHATE - OIL -DRUM	2
		NON-REG SOLIDS - OIL FILTERS -DRUM	2

CIRNAC-#R-04: Monitoring Program – Shallow Ground Water Monitoring.

References:

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

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.

Recommendation:

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.

Sabina Response:

All historical water quality baseline data, including information on baseline station locations, that supported receipt of the Project Certificate (No. 007) and the Type A Water Licence (2AM-BRP1831) were provided as part of the FEIS submission and WL Application in Appendix V6 and V7Y, respectively. This baseline information was thoroughly reviewed by all parties during the prescribed process, and deemed sufficient to meet the required regulatory applications.

Sabina provided details associated with shallow groundwater on the Project during the Technical Comment phase of the Type A Water Licence process. In the Final Submission Responses (July 2018), CIRNAC stated that they were satisfied with Sabina's approach to monitoring shallow groundwater flow associated with the TSF (INAC-TRC-6).

As discussed in Sabina's response, CIRNA-WLA-IR-05, Project infrastructure such as open pits and Waste Rock Storage Areas (WRSAs) are located in a region with a continuous permafrost terrain. Seasonally, as a result of the presence of the active layer (i.e., the uppermost layer of ground that seasonally thaws), there is a shallow perched water table. Sabina has assumed that all WRSA surface contact water will require containment and therefore water management infrastructure has been designed to contain this water (Sabina 2022). Runoff containment from the WRSAs is captured in containment ponds; the dam faces of these containment ponds are lined, and keyed into the permafrost (i.e., below the active layer, typically 2 to 4 m in depth) to ensure a seal between the permafrost foundation and the water management structure. For zones adjacent to open pits, any potential flows associated with the shallow perched water table would be captured using sumps within the active pit and managed as contact water for the Project as outlined in the Water Management Plan.

There is therefore no opportunity for the perched shallow groundwater from the active layer to impact the environment beyond the existing containments systems. As a result, there is no requirement for additional shallow groundwater monitoring at this time.

As part of final design of these water management structures, careful consideration will be given to the foundation stratigraphy, and the subsurface conditions will be documented as part of each of those pond designs. This final design will include characterization of frozen coarser grain sediments, as well as ice rich overburden material.

As part of regular Project operations, the WRSA diversion and containment structures will be monitored for seepage and runoff monthly, in addition to weekly during freshest (Waste Rock Management Plan, Section 7.1). Ground Temperature Cables (GTCs) will also be installed in WRSAs to monitor the rate of freeze back and permafrost development within the piles. All water containment dams will be inspected for erosion of, seepage through, or under the structures as a frequency of: (1) prior to freshet; (2) immediately after a major rain event; and (3) weekly for the remainder of the ice-free season. This monitoring is in addition to a seep survey conducted annually at all WRSAs each spring (Table 8.4-1 of Environmental Management and Protection Plan). Once collected, monitoring data will be reported to regulators in the Annual Water Licence Report (as per 2AM-BRP1831 Part B, Item 2); should monitoring identify that additional mitigation is required, Sabina will adaptively manage as appropriate to verify runoff from these areas is properly captured within the Project site water management system.

References:

Sabina (Sabina Gold & Silver Corp.). 2022. Back River Project Water and Load Balance. Submitted to the Nunavut Water Board. 30 August 2022.

CIRNAC-#R-05: Monitoring Program – Reporting.

References:

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

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.

Recommendation:

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).

Sabina Response:

Sabina will include laboratory pH results, as well as any collected field pH results, in future annual reports.

CIRNAC-#R-06: Monitoring Program – General Monitoring.

References:

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)

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.

Recommendation:

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.

Sabina Response:

Sabina's Environmental Management and Protection Plan defines general monitoring as that commonly included in a Water Licence as well as other monitoring carried out using established protocols, and may include quality assurance/quality control provisions, and addresses identified issues. General monitoring activities applicable to the Licence undertaken in 2021 are reported in the Annual Report and a summary of licence monitoring activity, or reason for not having monitored, was provided in Appendix C of the report. As explained in the annual report as well as response to CIRNA-01 above, where monitoring activities related to exploration infrastructure (e.g., Goose camp water use, discharge from the goose exploration fuel tank berm) relevant data was provided in the 2BE-GOO2028 Annual Report. Water quality sampling procedures are outlined in Sabina's approved Quality Assurance/Quality Control Plan, which is available on the NWB public registry.

With the initiation of Construction Details on all Aquatic Effects Management Plan (AEMP) sampling conducted, methodologies and results will be provided in the AEMP report when submitted.

CIRNAC-#R-07: Updating of Plans, Manuals and Reports.

References:

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

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.

Recommendation:

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

Sabina Response:

The updated Landfill and Waste Management Plan was submitted to the NWB on 1 September 2022.

CIRNAC-#R-08: Tailings Management Plan.

References:

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)

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.

Recommendation:

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

Sabina Response:

Sabina acknowledges CIRNAC's request and will consider providing the mined-out open pit volumes or depth-area-capacity curves in future iterations of the Tailings Management Plan.

CIRNAC-#R-09: Updated Waste Rock Management Plans – Locations.

References:

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

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"*.

Recommendation:

CIRNAC recommends that Sabina provide clarification on the location of the Echo/Goose WRSA in future Annual Report.

Sabina Response:

Sabina acknowledges CIRNAC's request and will provide clarification on the location of the Echo/Goose WRSA in future Annual Reports submitted to the Nunavut Water Board.

CIRNAC-#R-10: Updated Waste Rock Management Plans - PAG Vs Non-PAG.

References:

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

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?

Recommendation:

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.

Sabina Response:

Sabina confirms that the waste rock from the Echo Deposit has been tested and classified for acid rock drainage (ARD) potential. This geochemical analysis was detailed, and extensively reviewed, in the Type A Water Licence Application submitted to the Nunavut Water Board in Appendix E-3 (Sabina 2017). As discussed in Section 5.2 of this appendix, PAG and NPAG distribution for the Echo deposit was approximately 45% PAG and 55% NPAG by volume.

Sabina will include update the PAG and NPAG distribution for the Echo open pit in the next iteration of the Waste Rock Management Plan (WRMP) as directed by the Nunavut Water Board.

References:

Sabina (Sabina Gold & Silver Corp.). 2017. Revised Type A Water Licence Application for Sabina Gold & Silver Corp. Back River Project. Submitted to the Nunavut Water Board. 4 October 2017.

CIRNAC-#R-11: Updated Waste Rock Management Plans – Volumes.

References:

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

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.

Recommendation:

CIRNAC recommends that Sabina provide volumes for each WRSA in the future WRMPs.

Sabina Response:

As stated in the 2021 Annual Report there was no waste rock deposited in WRSAs in 2021. Sabina will report volumes of waste rock deposited in Waste Rock Storage Areas (WRSAs) as required by Part I, Item 9b of the Licence. On next update on the WRMP, Sabina will consider inclusion of expected total WRSA volumes.

CIRNAC-#R-12: Updated Water Management Plan.

References:

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)

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.

Recommendation:

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

Sabina Response:

Sabina notes that monitoring requirements are stipulated in the Type A Water Licence (2AM-BRP1831), Schedule I. Sabina recommends that this information is unnecessary in the Water Management Plan to reduce duplication, maintain consistency, and avoid potential confusion. Sabina confirms that the Water Management Plan (WMP) points to Schedule I of the Type A Water Licence in Section 10.

2.3 RESPONSE TO ENVIRONMENT AND CLIMATE CHANGE CANADA

ECCC-#01: Air Quality.

References:

Sabina Gold & Silver Corp. Back River Project, 2021 Annual Report for Water Licence 2AM-BRP1831, Section 2.9: A Summary of all General Waste Disposal Activities Including Monthly and Annual Quantities in Cubic Metres of Waste

Sabina Gold & Silver Corp. Back River Project, 2021 Annual Report for Water Licence 2AM-BRP1831, Section 2.10: Reporting of Incinerator Test Results Including the Materials Burned and the Efficiency of the Incinerator in Relation to Effects on Water and the Potential Deposit of Waste into Water

Sabina Gold & Silver Corp. Back River Project, 2021 Annual Report for Water Licence 2AM-BRP1831, Appendix B: Waste Disposal

Sabina Gold & Silver Corp. Back River Project 2021 Annual Report, Section 4.5.1 Air Quality (PC TCs 1 through 5), Project Certificate Condition No. 5

Comment:

Project Certificate Condition No. 5 states that "complete stack emissions testing for all incinerators will occur upon commissioning when testing thresholds are met to ensure achievement of the Canada-wide Standards for Dioxins and Furans and the Canada-wide Standards for Mercury (CCME 2000, 2001).".

Section 2.9 states that "wastes incinerated at the MLA (Marine Laydown Area) were not tracked in 2021 due to a record keeping oversight." Section 2.10 states that 'no incinerator testing was conducted in 2021." Appendix B contains daily waste incineration amounts but no annual total is provided. Annual amount looks like it may be greater than 26 tonnes per year.

Recommendation:

ECCC recommends that the Proponent provide the results of any incinerator stack testing that may have already been performed, or indicate a time frame for when incinerator stack testing will be performed in 2022.

Sabina Response:

Sabina has not conducted any stack testing to date but will review completing testing in 2023. Once complete, test results will be provided in the annual reports to the NWB and NIRB.

ECCC-#02: Geochemical Monitoring Results.

References:

Sabina Gold & Silver Corp. Back River Project, 2021 Annual Report for Water Licence 2AM-BRP1831, Section 2.6: Geochemical Monitoring Results

Comment:

In Table 2.6-1: Geochemical Characterization Results, several samples are indicated to have NPR ≤ 2, and are classified by the proponent as NPAG, based on its classification of NPAG (low Sulphur based on having a NPR less than 3 and a total sulfur content less than 0.16 wt. %). This includes samples 8211055; U/G Sample Triplicate, PS Blast Pattern #63 (1of6), PS Blast Pattern #63 (4of6), and Surface Sample (77-2). As indicated by the Proponent, these "are suitable for use in construction based on the material classification criteria outlined in the Quarry Management Plan.".

ECCC is of the view that the NPR ≤ 2 based on conventional ABA classification indicate that there is not enough neutralization potential available despite low sulfur content. Therefore, if the NPR falls between 1 and 2, it should be classified as uncertain. If these rock samples are with an NPR range between 1 and 2, are classified as uncertain, it is recommended that they not be used for construction.

Recommendation:

ECCC recommends that samples with an NPR greater than 1 and less than 2 should be classified as uncertain. As such not be used for construction because of its potential to generate acid.

Sabina Response:

The classification of waste rock and other geological material at the Project was based on the results of the geochemical characterization completed to support the Final Environmental Impact Statement (FEIS) and the Type A Water Licence (WL) Application. The Project-specific metal leaching acid rock drainage (ML/ARD) categories were presented in the Geochemical Characterization Report for the Back River Project, Nunavut (FEIS Appendix V2-7D; WL Appendix E-3). The site classification criteria were based on the results of static and kinetic waste rock characterization, as confirmed in the above reference appendices, are considered conservative. The rock management criteria developed for the FEIS were carried forward including in the Borrow Pits and Quarry Management Plan.

ECCC-#03: Geochemical Monitoring Results

References:

Sabina Gold & Silver Corp. Back River Project, Tailings Management Plan, Section 5.1: Tailings Management Plan

Comment:

The Proponent states, "approximately 18.7 Mt of tailings will be produced over the 15-year LOM. All tailings will be deposited as slurry. Initially, tailings will be deposited in the Echo TF, then transition to Umwelt Open Pit and Llama Open Pit once mining operations have ceased in each location (called Umwelt TF and Llama TF, respectively)." The Proponent further states that the "Echo TF will be covered with waste rock and overburden material once tailings deposition is complete. Water covers with a minimum water depth of 5 m will be used for closure of the Umwelt TF and Llama TF.".

ECCC notes that given the time of slurry tailings deposit in Echo TF, and the time when the Echo TF is covered with waste rock and overburden material, it is not clear whether the tailings slurry would have consolidated enough for a solid waste rock cover, or whether the Echo TF is intended to be a co-disposal facility. It is also not clear what the implications using Echo TF as a co-disposal facility might be.

There is also no supporting information provided, to demonstrate that the cover of slurry tailings in the Echo TF would not result in a spill over the edge or any adverse environmental issue if ground and/or surface water continue to discharge into the Echo TF. Furthermore, it is not clear whether 5 m water cover in the Umwelt and Llama TFs would be adequate to prevent remobilization of contaminant by water upwelling through the tailings or by wave action.

Recommendation:

ECCC recommends that the Proponent:

- Provide more details on how they plan to use waste rock and overburden material to cover tailings slurry in the Echo TF.
- Demonstrate that a 5 m water depth covers for of the Umwelt TF and Llama TF at closure will be adequate.

Sabina Response:

Sabina acknowledges ECCC's comment and highlights that Echo Pit is only planned to be used for tailings deposition, as Echo Tailings Facility (TF), for the first few years of Operations. All waste rock from the Echo Pit will be placed outside and surrounding the pit footprint (as Echo WRSA), with no waste rock being placed in the pit. Once tailings deposition in Echo TF is complete, the supernatant water from this facility will be pumped to Umwelt TF, and Echo TF will then be allowed to settle for multiple years as waste rock from Goose Main Pit mining is placed around the Echo TF (as Goose Main WSRA); this extended period will allow Sabina to monitoring the settling of tailings in Echo TF. Waste rock from Goose Main Pit will eventually be placed, at a very slow rate and in small (i.e., less than 5 m) lifts over the tailings in the Echo TF. Sabina also highlights that overburden is not intended to be placed over the tailings in Echo TF at this time. As part of the development of Goose Main WRSA development, a portion of the waste rock dump will be strategically constructed over the north end of Echo Pit (i.e., downstream) before waste rock is placed within the Echo TF to buttress any waste rock placed over the Echo Pit tailings.

Sabina notes that, long term, tailings at the Project site are expected to further consolidate and settle over the course of a few years and, assuming good water reclamation practices, additional capacity could be gained at the TFs. This additional containment volume in TFs that may be realized over time was discounted in the recent volumetric calculation for conservatism (i.e., discounted to assume lower immediate tailings storage volumes available in the deposition plan at each mined-out pit). This potential settlement will allow for metres of additional space at the top of the Echo TF and, coupled with the slow incremental waste rock loading, Sabina can monitor the in-pit waste rock placement during Operations to verify that no notable 'spill over' from the Echo TF occurs, that the tailings solids will be maintained within the pit footprint, and adjust closure of the Echo TF, if required. As the Project progresses, Sabina will implement monitoring commitments, including downstream of the Echo TF to verify water quality, as outlined in the Type A Water Licence (WL) and report as required to the NIRB and NWB.

Sabina highlights that the closure strategy of 5 m water covers for Project TFs was provided as part of the Final Environmental Impact Statement (FEIS) submission and WL Application in the description of the Project, Tailings Management Plan (TMP), Water Management Plan, and Interim Closure and Reclamation Plan and Closure Cost Estimate. This closure information was thoroughly reviewed by all intervening parties during the prescribed processes, including during closure cost discussions, and deemed sufficient to meet the required regulatory applications.

Water caps have proven highly effective in preventing oxidation of the submerged mine waste and eliminating acid drainage and metal leaching issues in the long term. As noted in the Global Acid Rock Drainage Guide (GARD 2014), "While only shallow water covers are needed to effectively prevent oxygen diffusion, a thicker cover (typically from 1 to 3 metres deep) is needed if prevent resuspension of fine tailings due to water action is a consideration.".

As detailed in FEIS Appendix V2-7G Section 8.2, a water cover of 5 m, in addition to the planned particle size distribution of the Project tailings (i.e., 80% finer than 50 µm; TMP), is deemed sufficient to prevent oxidation of tailings, prevent resuspension of tailings solids due to wave action, surge following storm events, and ice scour. Sabina will implement monitoring commitments as outlined in the Type A WL (2AM-BRP-1831, Amendment No. 1) and report as required to the NIRB and NWB, including those associated with performance of flooded TFs for the Project.

References:

GARD. 2014. GARD Guide: http://gardguide.com/index.php?title=Main_Page.

2.4 RESPONSE TO NUNAVUT WATER BOARD

NWB-#01: Management Plans Updates.

References:

N/A

Concern:

Provide a table listing all Management Plans modified in the reporting year and include the following information:

- Title of the plan.
- Most recent NWB Approval date (for approved plans).
- Most current update date.
- Brief description of the update including sections modified.
- Classification of the update (significant vs. insignificant as per Licensee).
- (Note that upon review of the plan, the Board will make their own determination of significance independent of the Licensee's suggestion).

Suggestions and Recommendation:

Provide a table listing all Management Plans modified in the reporting year and include the following information:

- Title of the plan.
- Most recent NWB Approval date (for approved plans).
- Most current update date.
- Brief description of the update including sections modified.
- Classification of the update (significant vs. insignificant as per Licensee).
- (Note that upon review of the plan, the Board will make their own determination of significance independent of the Licensee's suggestion).

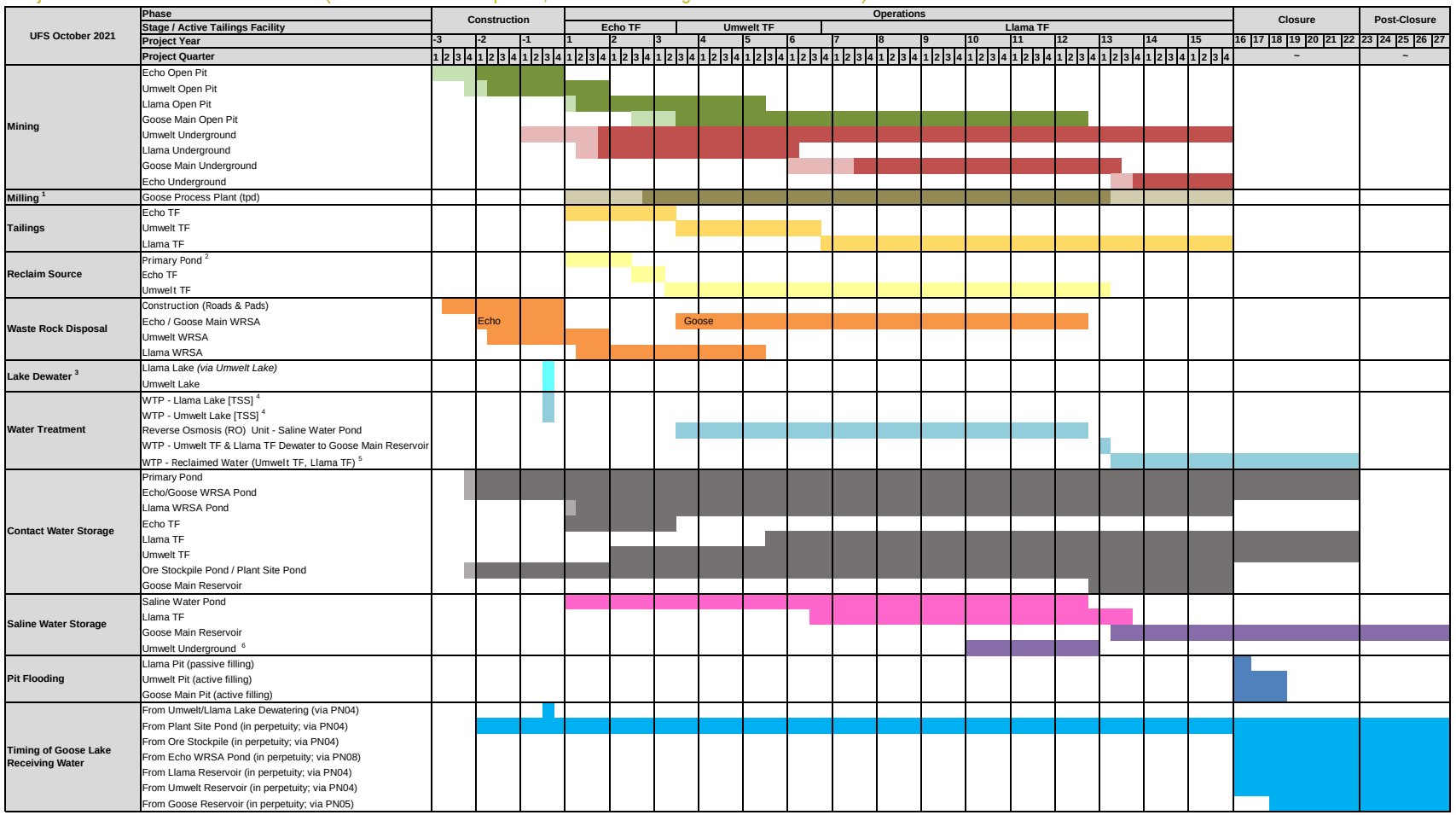
Sabina Response:

Sabina will provide this information in future Annual Reports including the 2022 report.

Appendix A

Project Timeline

Project Timeline – UFS October 2021 (WSP Golder WLB Update; based on average climate conditions)



NOTES:

1. Milling will be at 2,000 to 3,000 tpd between Y1, Q1 and Y2, Q3, and 4,000 tpd starting in Y2, Q4, ramping down (variable feed rate) starting in Y13, Q2 till closure.
2. Reclaim from Primary Pond used for start-up until each Tailings Facility supernatant pond is sufficiently established and/or to supplement the reclaimed water requirements.
3. 50% direct discharge to Goose Lake; 50% treated for total suspended solids (TSS) before discharge. Dewatering from lakes (Umwelt and Llama) assumed to be completed in one open water season.
4. Total suspended solids.
5. Water treatment plant treating to reduce metals, phosphorus, nitrogen species, and suspended solids loading in the facilities.
6. The Umwelt Undergrouns is used as repository for saline water in Year 10 to 12. If insufficient volume is available at surface for saline water storage, additional capacity in Umwelt Underground is available..

COLOUR LEGEND

- Open Pit Mining - PreDevelopment
- Open Pit Mining - Production
- Underground Mining - PreDevelopment
- Underground Mining - Production
- Process Plant - Ramp Up & Ramp down
- Process Plant - Full Production
- Tailings Deposition
- Supernatant Water Reclaim for Process Plant
- Waste Rock Placement
- Lake Dewatering
- Water Treatment
- Contact Water (Temporary Storage) - Construction
- Contact Water (Temporary Storage) - Use
- Saline Water (Temporary Storage)
- Saline Water (Permanent Storage)
- Contact and Fresh Water Flooding
- Contact Water Overflow to Goose Lake