Crown-Indigenous Relations and Northern Affairs Canada
Relations Couronne-Autochtones et Affaires du Nord Canada

Water Resources Division
Resource Management Directorate
Nunavut Regional Office
918 Nunavut Drive
Iqaluit, NU, X0A 3H0

Your file - Votre référence
2AM-BRP1831
Our file - Notre référence
GCDocs# 126418201

June 26, 2024

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

Re: Crown-Indigenous Relations and Northern Affairs Canada's Review of the 2023 Annual Report for Back River Project, Type A Water Licence No. 2AM-BRP1831

Dear Richard,

Thank you for the April 17, 2024, invitation to review the Annual Report for the Back River Project, submitted by B2Gold Nunavut, 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 and Northern Affairs Act*. Please find CIRNAC comments and recommendations in the attached Technical Memorandum.

If there are any questions or concerns, please contact LeeAnn.Pugh@rcaanc-cirnac.gc.ca or (867) 975-4751 or Andrew Keim at (867) 975-4555 or Andrew.Keim@rcaanc-cirnac.gc.ca.

Sincerely,

Joyce Demers, B.Sc.
A/ Manager of Water Resources

Technical Review Memorandum

Date: June 26, 2024

To: Richard Dwyer, Licensing Administrator, Nunavut Water Board

From: Joyce Demers, A/ Manager of Water Resources, CIRNAC

Subject: **Crown-Indigenous Relations and Northern Affairs Canada's Review of the 2023 Annual Report for the Back River Project, Type A Water Licence No. 2AM-BRP1831**

Region: ☒ Kitikmeot ☐ Kivalliq ☐ Qikiqtani

A. Background

The Back River Project is located within the West Kitikmeot region of southwestern Nunavut. It is situated approximately 400 km southwest of Cambridge Bay, 95 km southeast of the southern end of Bathurst Inlet, 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 Marine 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 (WIR). 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.

In April of 2023, B2Gold Nunavut purchased Sabina Gold and Silver Corp. (Sabina), including the Back River Project. The Back River Project is now wholly owned and operated under B2Gold Nunavut, a subsidiary of B2Gold Corp. The Project is fully financed, and B2Gold Nunavut will be continuing activities at the Back River Project.

The project's initial development works began in 2018 and included the development of pads, all-weather access roads and an airstrip at the MLA, as well as the construction of a tent camp, bulk fuel tank, and barge off-loading area for the receipt, storage and transfer of materials necessary to support construction activities via sealift and WIR. Development at the Goose Property continued through 2022, and included all-weather roads, bulk fuel tank, pad areas, and pre-stripping of the Echo Pit.

In 2023, B2Gold Nunavut continued construction activities with a focus on advancing and de-risking future development. The activities completed in 2023 included:

- Completion of Phase 1 of the accommodations complex at the Goose Property
- Commissioning of the Goose Mine camp sewage treatment plant in Q3 of 2023;
- Initiation of construction of the primary pond at the Goose property;
- Completion of the concrete batch plant and a fully automated rebar cutting and bending machines;
- Earthworks necessary to extend the Goose Property airstrip to 1,524 m (5,000 feet);
- Continued pre-stripping of the Echo Pit;
- Continued advancement of the Vault Underground decline;
- Completion of the Rascal Stream upgrade crossing to accommodate haul truck traffic;
- Llama and Umwelt Lakes and upstream waterbodies were fished out in preparation for future dewatering;
- During the 2022/2023 winter season over 800 loads were transported on the winter ice road;
- The fuel tank containment area at the MLA was enlarged to facilitate additional storage;
- The MLA was reorganized to maximize space for the 2023 sealift unload;
- All major equipment and materials required for construction were procured or marshalled and were delivered or are in transit to the MLA; and
- Commencement of environmental monitoring and baseline programs including atmospheric, archaeology, water quality, fisheries, wildlife, geochemical, geotechnical, and vegetation programs.

No mine waste or water management infrastructure have yet been completed at the Goose Property, apart from the Goose Mine Sewage Treatment Plant. The sewage treatment plant was activated in August 2023 with trials and testing continuing through the remainder of the year.

CIRNAC 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-01	Site Water Management – Treated Sewage Effluent and Grey Water Discharges
R-02	Infrastructure & Engineering – Echo Pit Open Pit Walls
R-03	Infrastructure & Engineering – Fuel Tank Farm Liner System
R-04	Infrastructure & Engineering – Camp Pad Contact Water Pond Liner System
R-05	Infrastructure & Engineering – Primary Pond Dam Unknown Backfill
R-06	Infrastructure & Engineering – Goose Neck and Echo Crossings Culvert Blockages
R-07	Infrastructure & Engineering – Goose Airstrip Ponding
R-08	Infrastructure & Engineering – MLA Quarry Tank Farm Liner System
R-09	Infrastructure & Engineering – Lead Author of 2023 Annual Geotechnical Inspection
R-10	Acid Rock Drainage & Metal Leaching
R-11	Acid Rock Drainage & Metal Leaching
R-12	Landfill & Waste Management – Timeline for Construction of Hazardous Waste Storage Facility
R-13	Landfill & Waste Management – Registration as a Hazardous Waste Generator
R-14	Landfill & Waste Management – Classification of Wastes
R-15	Landfill & Waste Management – Incinerator Testing
R-16	Landfill & Waste Management – Schedule for Landfill Construction
R-17	Outstanding 2022 Technical Review Comments

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
2023 Annual Report	B2Gold Nunavut, April 2024
2023 Annual Geotechnical Inspection Report	B2Gold Nunavut, April 2024
Spill Contingency Plan	B2Gold Nunavut, February 2024
CIRNAC Inspection Reports	CIRNAC, March, September 2023
CIRNAC 2022 Annual Report Comments	CIRANC, June 30, 2023

C. RESULTS OF REVIEW

1. Site Water Management – Treated Sewage Effluent and Grey Water Discharges

Reference:

2023 Annual Report for Water Licence 2AM-BRP1831, Section 2.13
2023 Annual Report for Water Licence 2BE-GOO2028

Comment:

The Report notes that the new Goose Mine Camp Sewage Treatment Plant (STP) was commissioned in August of 2023 and the eventual plan is to discharge the treated effluent to the mine's Tailings Storage Facility (TSF) which has not yet been constructed. In the interim, throughout the remainder of 2023 and 2024 treated sewage effluent from the new mine site Accommodations Complex and associated Sewage Treatment Plant (7,650 m3) has/will be discharged onto the tundra at a monthly rate equal to the monthly volume of water provided to the Goose Mine Camp.

In addition, greywater generated at the Goose exploration camp (total annual camp water usage of 6,795 m3 and average of 19 m3/day, was discharged at two tundra locations at the Goose exploration camp located at a site away from surface water.

CIRNAC is concerned that the cumulative total volume and nature of the effluents being discharged onto the tundra could begin to negatively impact the condition of the existing tundra vegetation of the affected areas.

Recommendation:

(R-01) CIRNAC recommends that B2Gold Nunavut:

a) Provide information on the STP design and operational details including details for the management of STP sludge.
b) Provide a map showing the location(s) and areas affected by these interim effluent discharges onto the tundra.
c) Monitor and report on the quality of the treated effluent and grey water being discharged to the tundra.
d) Develop and implement a tundra monitoring plan to document possible changes to the tundra as a result of these discharges.

2. Infrastructure & Engineering – Echo Pit Open Pit Walls

Reference:

Goose & MLA Project Sites – 2023 Annual Geotechnical Inspection, Section 5.2.2 (Echo Pit)

Comment:

The 2023 Annual Geotechnical Inspection notes that “no detailed assessment on the pit walls was performed during the inspection” for Echo Pit and this is not addressed anywhere else in the 2023 Annual Report for Back River. Annual geotechnical inspections must include open pit walls as per Part I, Condition 10. e. of the Project’s approved Water Licence.

Recommendation:

(R-02) CIRNAC recommends that B2Gold Nunavut perform geotechnical inspections of all open pit walls, including assessment of rock wall faces, and report its findings in all future Annual Geotechnical Inspections.

3. Infrastructure & Engineering – Fuel Tank Farm Liner System

Reference:

Goose & MLA Project Sites – 2023 Annual Geotechnical Inspection, Section 5.2.4 (Goose Tank Farm)

Comment:

The liner system installation for the Goose Fuel Tank Farm (Phase 1) appears to have been completed as fuel is currently being stored in Tank #1; however, the 2023 Annual Geotechnical Inspection notes that much of the liner system remains exposed and unprotected while construction for Tank #2 is ongoing. This leaves the liner system at risk to damage from construction activities as well as degradation due to solar exposure (i.e., ultraviolet light degradation).

Recommendation:

(R-03) CIRNAC recommends B2Gold Nunavut place sufficient liner cover material over the entire liner system for the Goose Fuel Tank Farm to prevent damage from future construction activities and solar degradation.

4. Infrastructure & Engineering – Camp Pad Contact Water Pond Liner System

Reference:

Goose & MLA Project Sites – 2023 Annual Geotechnical Inspection, Section 5.2.6 (Camp Pad Contact Water Pond)

Comment:

The 2023 Annual Geotechnical Inspection notes that the liner system for the Camp Pad Contact Water Pond is exposed and unprotected while the pond appears to be operational. This leaves the liner system at risk to damage from construction activities as well as degradation due to solar exposure (i.e., ultraviolet light degradation).

Additionally, it was noted that the liner system is damaged in several locations along the southern limits of the pond.

Recommendation:

(R-04) CIRNAC recommends B2Gold Nunavut to:

a) Repair the liner system before allowing contact water into the Camp Pad Contact Water Pond.
b) Ensure that sufficient liner cover material is placed over the entire liner system of the pond to protect from further damage due to construction future activities and solar degradation.

5. Infrastructure & Engineering – Primary Pond Dam Unknown Backfill

Reference:

Goose & MLA Project Sites – 2023 Annual Geotechnical Inspection, Section 5.2.7 (Primary Pond Dam)

Comment:

The 2023 Annual Geotechnical Inspection notes that a portion of the temporary road constructed on the upstream side of the Primary Pond Dam was backfilled with unknown “dark color fill material with a more synthetic smell”. It is unknown if this material is considered suitable for dam construction by the Designer-of-Record (SRK Consulting (Canada) Inc.)

Recommendation:

(R-05) CIRNAC recommends that within thirty (30) days B2Gold Nunavut confirms with the Designer-of-Record as to the suitability of the unknown material for use of the Primary Pont Dam as required by the Dam’s construction quality assurance program.

6. Infrastructure & Engineering – Goose Neck and Echo Crossings Culvert Blockages

Reference:

Goose & MLA Project Sites – 2023 Annual Geotechnical Inspection, Section 5.2.9 (Goose Neck and Echo Crossings)

Comment:

In the 2023 Annual Geotechnical Inspection, three of the five culverts at the Goose Neck Crossing were observed to be blocked by rockfill material. Additionally, one culvert inlet at the Echo Crossing was observed to be blocked by sloughed material.

Recommendation:

(R-06) CIRNAC recommends that B2Gold Nunavut clear blockages from all culvert inlets and outlets for the Goose Neck and Echo Crossings to prevent surface water flows from ponding next to the road embankments.

7. Infrastructure & Engineering – Goose Airstrip Ponding

Reference:

Goose & MLA Project Sites – 2023 Annual Geotechnical Inspection, Section 5.2.14 (Goose Airstrip and Access Road)

Comment:

The 2023 Annual Geotechnical Inspection observed water ponding and permafrost degradation at the south end of the Goose Airstrip. Additionally, the current southeast extension of the airstrip was noted to intersect several surface water features which have not yet been diverted away from the airstrip embankment.

Recommendation:

(R-07) CIRNAC recommends that B2Gold Nunavut actively manage surface water ponding along the airstrip with temporary dewatering until permanent water management structures (e.g., the Rascal Diversion Berm) are in place. This will reduce the potential for thermal degradation which could lead to settlement along the airstrip embankment.

8. Infrastructure & Engineering – MLA Quarry Tank Farm Liner System

Reference:

Goose & MLA Project Sites – 2023 Annual Geotechnical Inspection, Section 5.3.1 (MLA Quarry Tank Farm)

Comment:

The 2023 Annual Geotechnical Inspection notes that much of the liner system remains exposed and unprotected while construction for the MLA Quarry Tank Farm is ongoing. This leaves the liner system at risk of slippage as well as future solar degradation.

Recommendation:

(R-08) CIRNAC recommends that B2Gold Nunavut place sufficient liner cover material over the entire liner system for the MLA Quarry Tank Farm to prevent liner system slippage and solar degradation.

9. Infrastructure & Engineering – Lead Author of 2023 Annual Geotechnical Inspection

Reference:

Goose & MLA Project Sites – 2023 Annual Geotechnical Inspection, Second Page and Closure

Comment:

The Lead Author (Anna Timchenko) of the 2023 Annual Geotechnical Inspection is not a professional engineer registered with the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists (NAPEG), which is a requirement as per Part I, Condition 10 and is a regulated profession defined in Schedule A of the Project's Water Licence.

Recommendation:

(R-09) CIRNAC recommends that B2Gold Nunavut ensure that the Lead Author and Inspector for all future Annual Geotechnical Inspections for Back River is a professional engineer registered with NAPEG.

10. Acid Rock Drainage & Metal Leaching

Reference :

B2Gold Nunavut 2023 Annual Report, Section 2.6a, 2.6b, and 2.6c

Sabina Back River Project Waste Rock Management Plan 2022, Section 7.1.4

Comment:

The annual report states that a total of 284,173 bank m3 of waste rock was generated and used for construction in 2023. It also states that 5,400 m3 of waste rock was identified as PAG, which equates to approximately 2% of the total waste rock used in construction. The geochemical characterization results presented in the report indicate that 30% of potential construction material during the project are classified as PAG.

Recommendation:

(R-10) CIRNAC recommends that B2Gold Nunavut provide more detailed discussion of:

a) The source of the 5,400 m3 PAG waste rock,
b) The source of the 284,173 m3 of waste rock used in construction,

c) The source of all PAG-classified samples identified in the annual report,
d) The results of a-c compared to as built volumes of waste rock used in construction, as well as all daily records which link rock disposal locations to sampling results.

11. Acid Rock Drainage & Metal Leaching

Reference:

B2Gold Nunavut 2023 Annual Report, Section 2.6b, and 2.6c

Sabina Back River Project Waste Rock Management Plan 2022, Section 5.3.1.

Comment:

Section 2.6b of the annual report states that in 2023,generated waste rock was used as construction material; however Section 2.6c of the report notes that construction material was evaluated based on criteria outlined in the Quarry Management Plan, as opposed to the Waste Rock Management Plan.

Recommendation:

(R-11) CIRNAC recommends that B2Gold Nunavut clarify the source of the construction material as originating from either waste rock or quarry rock and its evaluation of materials based on the appropriate material management plan.

12. Landfill & Waste Management – Timeline for Construction of Hazardous Waste Storage Facility

Reference :

Section 2.22 of the Back River Project, 2023 Annual Report

Comment:

CIRNAC inspections in March and September of 2023 identified concerns with B2Gold's storage and containment of Hazardous Wastes. The Annual Report comments on the removal of barrels from the snow pile near the runway and that a third-party engineering firm was retained to review options for a new hazardous waste storage facility.

Construction drawings and a construction report are to be submitted at least 60 days prior to the construction of the new facility.

Recommendation:

(R-12) CIRNAC recommends that B2Gold Nunavut:

a) Identify the proposed timeline for the completion of the options review and provide an approximate schedule for submission of the proposed detailed report, drawings, and construction of the new hazardous waste storage facilities.
b) Include a summary in the Annual Report of the corrective actions taken to address CIRNAC's concerns with the current storage and containment of hazardous waste as noted in CIRNAC's 2023 inspection reports.

13. Landfill & Waste Management – Registration as a Hazardous Waste Generator

Reference:

Section 2.9 of the Back River Project, 2023 Annual Report

Comment:

The 2023 Back River Annual Report states that the quantity and type of wase backhauled to KBL in Yellowknife is included in Appendix B. The Nunavut Guideline for Hazardous Waste Management (Oct. 2017) requires Registration of Hazardous Waste Generators, Carriers, and Receivers, and that all manifests must be completed by the generator and signed-off by carriers and receivers of all hazardous waste. The Report implies, but does not clearly state, that backhaul to KBL in Yellowknife was completed by air transport.

Recommendation:

(R-13) CIRNAC recommends that B2Gold Nunavut:

1) Confirm its registration as a Hazardous Waste Generator and that hazardous waste manifests are completed as required.
2) Confirm that the transportation of hazardous waste to KBL was via air transport and if so, that the shipping of hazardous waste by air was compliant with the International Civil Aviation Organization (ICAO).

14. Landfill & Waste Management - Classification of Wastes

Reference:

Appendix B of the Back River Project, 2023 Annual Report

Comment:

Appendix B includes the types and quantities of wastes backhauled in 2023.

It is assumed that all wastes listed in Appendix B were shipped to KBL in Yellowknife.

Several items refer to contaminated snow, contaminated soil, or contaminated water, but do not identify the contaminant.

The management and tracking of hazardous waste requires classification of those wastes according to the Transportation of Dangerous Goods Act. Classification of the wastes is not clearly stated in Appendix B Table.

Recommendation:

(R-14) CIRNAC recommends that B2Gold Nunavut:

a) Confirm its registration as a Hazardous Waste Generator and that hazardous waste manifests are completed as required.
b) Confirm that the transportation of hazardous waste to KBL was via air transport and that the shipping of hazardous waste was compliant with the International Civil Aviation Organization (ICAO).
c) Identify the contaminant in soil, snow, and/or water.
d) Revise the table in Appendix B to include an additional column for waste classification of hazardous waste and that non-hazardous waste is identified as non-hazardous.

15. Landfill & Waste Management - Incinerator Testing

Reference:

Section 2.10 of the Back River Project, 2023 Annual Report

Comment:

B2Gold Nunavut notes that incinerator testing was not completed in 2023 and that further testing is scheduled for 2024. The Nunavut Department of Environment Guidelines for the Burning and Incineration of Solid Waste (2010, revised January 2012)

provides best management practices. Table 2 lists waste that can be burned or incinerated, and those that may be incinerated if equipment has sufficient air pollution controls. Table 3 identifies basic parameters to be measured and recorded. Furthermore, the guideline recommends either one-time or continuous emission monitoring, depending on the type and quantity of waste incinerated, including oxygen and carbon monoxide in undiluted gases. Annual or periodic stack sampling for hydrogen chloride, dioxins and furans may be required where feedstocks include organic materials that contain chlorine, such as chlorinated solvents and plastics, PVC, or marine driftwood.

Recommendation:

(R-15) CIRANC recommends that B2Gold Nunavut provide:

a) Additional details for all planned incinerator testing in 2024 and its proposed schedule for sampling and analysis.
b) Details on its proposed sampling of incinerator ash.
c) The frequency and approximated schedule for sampling and testing to be completed in 2024.

16. Landfill & Waste Management – Schedule for Landfill Construction

Reference:

Section 2.9 of the Back River Project, 2023 Annual Report

Comment:

The Annual Report states that solid waste suitable for landfill disposal is being temporarily stored at the Goose Quarry until the Goose Mine Site WRSA Landfill is operational. Item #11 of CIRNAC's review of the 2022 Annual Report recommends that the Annual Report provide an approximate timeframe for the development and completion of the landfill.

Section 2, Storage of Waste in Quarries CIRNAC's September 21, 2022, review of the Landfill and Waste Management Plan, recommended the applicant provide more information how waste will be contained within quarries.

Recommendation:

(R-16) CIRNAC recommends that B2Gold Nunavut provide an approximate schedule for the construction and commissioning of the proposed landfill be included in the 2023 annual report.

Furthermore, the report should provide a summary of how stockpiles wastes are contained to avoid environmental impacts to surrounding land and waters.

17. Outstanding 2022 Technical Review Comments From 2022 Annual Report

There are five outstanding comments from the 2022 Annual Report which were not addressed in the 2023 Annual Report. The outstanding comments are R-01, R-02, R-09, R-10 and R-11. Please refer to Appendix A for a summary table of the outstanding issues. Please see below for the comments and recommendations.

R-2022-01. Surface Water Quality- Goose Lake Hydrodynamic and Water Quality Model

Comment:

Upon review of the water quality monitoring data presented in the Back River Project - 2022 Aquatic Baseline Report for Goose Lake West Bay (Table C-1) Goose Lake Central Basin (Table C-2), Goose Lake SE Basin (Table C-3), Goose Lake Tail (Table C-4),Propeller Lake (Table C-5), and Reference Lake B (Table C-6), it is apparent that pH values in all of these water bodies sampled in 2022 were consistently reported to be below a pH of 6.5, with average values of 6.3 at Goose Lake West Bay, 6.3 at Goose lake Central Basin, 6.4 at Goose Lake SE Basin, 6.15 at Goose Tail, 6.3 at Propeller Lake and 6.5 at Reference Lake B.

As reported, these pH values are generally below the CCME Guideline (chronic) range for the protection of freshwater aquatic life of 6.5-9.0 and the Health Canada Aesthetic Guideline range of 7.0-10.5. This indicates that the pH of the water in these water bodies are indicative of a naturally low level of acidity.

Similarly, the low degree of hardness (as CaCO3) consistently measured in these water bodies, with average values of 29 mg/L at Goose Lake West Bay, 17.3 mg/L at Goose lake Central Basin, 12 mg/L at Goose Lake SE Basin, 14 mg/L at Propeller Lake and 16.6 mg/L 6 at Reference Lake B are indicative of naturally very soft water, which typically ranges from 0-60 mg/L. (Health Canada Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Hardness, 2022).

The combination of chronically low pH water, combined with the very soft waters that are characteristic of the freshwater bodies in the Back River project area, indicate that these waters have a low buffering capacity. This means that these waters, and the resident aquatic resources, are exceptionally vulnerable to the introduction of contaminants such as mine-related wastewater.

Reference:

Sabina 2022 Annual Report, Section 1.3; Appendix E Back River Project - 2022 Aquatic Baseline Report - Appendix C, Tables C-1, C-2, C-3, C-4, C-5, C-6, C-7

Recommendation:

(R-2022-01) CIRNAC recommends that the Licensee update the Goose Lake Hydrodynamic and Water Quality Model by incorporating the results of the 2022 field program reported in the Back River Project - 2022 Aquatic Baseline Report. The updated Hydrodynamic Model should be made available for review prior to submission of the 2023 Annual Report to allow for review to be completed and recommendations on Aquatic effect developed.

R-2022-02. Surface Water Quality- Goose Lake Hydrodynamic and Water Quality Modeling

Comment:

In the 2022 Annual Report, Sabina has made a number of revisions to the Modeling done. CIRNAC recognizes these modifications based on feedback from intervenors. The following further issues have been identified.

a) The modelling time period has been increased to 67 years (Sections 2.2, 3.2), this addresses one of the deficiencies of the previous model that ended with the end of operations. Various sensitivity analyses were run to evaluate effects of changes to meteorological conditions, ice cover, and inflow quantity and quality for a 10-year period – extending five years into post-closure. A longer ice cover period was also evaluated. However, modelling 67 years into the future should also consider the possible effect of climate change. Presently, their hydrological inputs are the past 10 years repeated into the future.

b) Selenium concentrations – in Section 9.0, the predicted 95th percentile concentrations of iron and phosphorous are slightly above the water quality guideline values but there is no mention of selenium. In the Appendix B timeseries for constituents, concentrations of selenium for PN04 are well above the water quality benchmark value and slightly over for PN05. In Appendix C, the concentrations of selenium at GLTL are over the benchmark value.

c) Phosphorous concentrations – in Section 9.0, the 95th percentile concentrations of most constituents are predicted to remain below water quality benchmarks (Table 1) at the edge of mixing zones, with the exception of phosphorus. The predicted 95th percentile concentration of phosphorus at two other assessment locations (i.e., central basin and tail of Goose Lake) are also predicted to be above the benchmark. The conservative model approach adopted (e.g., exclusion of biological uptake during open-water conditions) likely contributed to the

exceedances of the phosphorus benchmark.

Reference:

Hydrodynamic and Water Quality modelling of Goose Lake, August 2022

Recommendation:

(R-2022-02) CIRNAC recommends that the as follows.

a) The Licensee is to include a discussion of climate change effects on the forecasts provided in further Annual reports. This includes an evaluation of various scenarios.
b) As Selenium can be more toxic than iron or phosphorous, it is recommended that risks associated with Selenium exceedances should be discussed and addressed in the aquatic effects management plan and included in the next annual report.
c) It is recommended that the Licensee attempt to quantify what the phosphorous uptake could be over the summer and indicate whether elevated levels of phosphorus may contribute to a change in the lake's trophic status over time. This is to be reported on in the next Annual Report.

R-2022-09. Landfill and Waste Management Plan – Approvals

Comment:

Section 2.20 of the 2022 Annual Report references revisions to the Landfill and Waste Management Plan were submitted in August 2022. There is no reference to responses to this plan received from CIRNAC and KIA, or of follow-up actions by Sabina.

Reference:

Sabina 2022 Annual Report, Section 2.20; September 21, 2022, letter re. CIRNAC review of Landfill & Waste Management Plan; September 16, 2022, letter re. Kitikmeot Inuit Association (KIA) review of Landfill and Waste Management Plan

Recommendation:

(R-2022-09) CIRNAC recommends that the Licensee provide clarification on Section 2.20 reference that responses were received, and feedback is pending and include a detailed explanation of how the comments received have been incorporated into the plan to date.

R-2022-10. Landfill and Waste Management Plan

Comment:

The CIRNAC review reiterated the requirement for submission of a design and construction report 60 days prior to construction of a landfill. Section 2.9 of annual report indicates landfill will be constructed in the future; however, the timing is unclear. We present this comment to flag that pre-development reporting will be required for this element, and that with a 60-day window for review it should be well in advance of the planned construction season so as to avoid potential construction delays.

Reference:

Sabina 2022 Annual Report, Section 2.9, September 21, 2022, letter re. CIRNAC review of Landfill & Waste Management Plan

Recommendation:

(R-2022-10) CIRNAC recommends that the Licensee provide an approximate timeframe for development and a proposed workplan for the coming year that includes milestones for submission of plans to be reviewed.

R-2022-11. Waste Management Plans – Waste oil

Comment:

Appendix B, second table includes a column itemizing “waste oil to furnace”. This is not referenced in Section 2.9 or any other location within the 2022 Annual Report.

Reference:

Sabina 2022 Annual Report, Section 2.9 and Appendix B

Recommendation:

(R-2022-11) CIRNAC recommends that the Licensee provide clarity related to this item and explain why it is included in Section 2.9 of the Annual Report. Sabina is to provide information on what this item represents and whether it is included according to a specific plan that has been reviewed.

Appendix A: Table of Outstanding Technical Review Comments from 2022

2022 Technical Review Comment Number	Technical Review Comment Subject	B2Gold Nunavut's Response to Technical Review Comment
1	Surface Water Quality	The Hydrodynamic Model was not updated and made available for review prior to submission of the 2023 Annual Report.
2	Surface Water Quality	CIRNAC's recommendations were therefore not addressed as the Hydrodynamic Model has not yet been updated.
9	Landfill & Waste Management	Topic referred to 'waste oil furnace" not referenced in 2023 Annual Report. Recommendation was to reference section 2.9 in the annual report. Table B3 reports that no oil waste disposed through a waste oil burner in 2023.
10	Landfill & Waste Management	Topic discussed review of Landfill and Waste Management Plan. Was recommended to reference that responses were received, and feedback is pending, and how comments received were incorporated. Comments were provided in Waste management Plan.
11	Landfill & Waste Management	Recommended that the Annual Report provide an approximate timeframe for development of a proposed work plan for coming year. A schedule for development of the proposed landfill is not provided.