

Environmental Protection Operations Directorate
Prairie & Northern Region
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ECCC File: 6100 000 115/002
NWB File: 2AM-BRP1831



June 26, 2024

via email at: licensing@nwb-oen.ca

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

Dear Richard Dwyer:

RE: 2AM-BRP1831 – B2Gold Corp. – Back River Gold Mine Project – 2023 Annual Report

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Nunavut Water Board (NWB) regarding the above-mentioned 2023 NWB Annual Report for the NWB.

ECCC provides expert information and knowledge to project assessments on subjects within the department's mandate, including climate change, air quality, water quality, biodiversity, environmental preparedness and emergencies. This work includes reviewing proponent characterization of environmental effects and proposed mitigation measures. We provide advice to decision-makers regarding a proponent's characterization of environmental effects, the efficacy of their proposed mitigation activities, and may suggest additional mitigation measures. Any comments received from ECCC in this context does not relieve the proponent of its obligations to respect all applicable federal legislation.

The following comments are provided:

1. Open Burning of Natural Fiber Textiles

Reference(s)

- Section 2.9: A Summary Report of All General Waste Disposal Activities Including Monthly and Annual Quantities in Cubic Metres of Waste Generated and Location of Disposal, B2Gold Back River Project, 2023 Annual Report for Water Licence 2AM-BRP1831, April 2024
- ECCC's Brochure on Open Burning, link:
https://www.canada.ca/content/dam/eccc/migration/main/gdd-mw/684b44dd-5780-4f73-bc58-a97e31a19edc/com1170_open_burning_brochure_e_v6_for-20web.pdf



Comment

Section 2.9 from the 2023 Annual Report document, states that “B2Gold Nunavut confirms that only paper products, paperboard packing including boxboard and cardboard, and untreated wood including lumber and plywood, and natural fiber textiles are open burned at the Back River Project” in response to ECCC’s comments on open burning from the 2022 Annual Report.

ECCC discourages the practice of open burning where practicable, and would like to note that even natural fiber textiles may contain chemical dyes, that could be released into the atmosphere or remain in the ash, if burned. Please refer to ECCC's Brochure on Open Burning for more details.

ECCC Recommendation(s)

ECCC recommends that the Proponent eliminate the practice of open burning, where practicable. ECCC further recommends that the Proponent dispose of natural fiber textiles using the on-site incinerator.

2. Acid Rock Drainage (ARD)/Metal Leaching (ML) Classification Criteria

Reference(s)

- Section: 2.6: Geochemical Monitoring Results, B2Gold Back River Project, 2023 Annual Report for Water Licence 2AM-BRP1831, April 2024
- Table 2.6-1: Geochemical Characterization Results, B2Gold Back River Project, 2023 Annual Report for Water Licence 2AM-BRP1831, April 2024
- MEND (2009): MEND Report 1.20.1 Prediction manual for Drainage Chemistry from Sulphidic Geologic Materials, December 2009, link: https://mend-nedem.org/wp-content/uploads/1.20.1_PredictionManual.pdf

Comment

Section 2.6 of the 2023 Annual Report document states that “These data indicated that the materials with low ARD potential (NPAG [non potentially acid generating] and NPAG – Low Sulphur) are suitable for use in construction based on the material classification criteria outlined in the Quarry Management Plan...”. The following criteria is also stated as the ARD classification of samples results uses the following criteria:

“NPAG = NP/AP > 3

NPAG – Low Sulphur = NP/AP < 3 and Total Sulphur < 0.16 wt. %

PAG – Uncertain = 1 < NP/AP < 3

PAG = NP/AP < 1”

Table 2.6-1 of the report demonstrates that some of the samples classified as ‘NPAG – Low Sulfur’ have a neutralization potential ratio (NPR) less than 2. ECCC would like to note, that information provided in the MEND (Mine Environment Neutral Drainage) Report 1.20.1 (2009), indicates that samples that have NPR less than 2, are capable of generating acid rock drainage (ARD), and are to be classified as ‘uncertain’.

With the 'uncertain' classification, ECCC is of the opinion that these rock materials should not be used for construction, because of their ARD/ML potential. The MEND report further indicates that a '% sulphur' cut-off should not be used as the only means of assessing ARD, because it also depends on the amount of neutralization potential available. An NPR less than 2, seems to be an indication that there is not enough neutralization potential available. ECCC acknowledges the Proponent for using NPR 3 as a cut of PAG and non-PAG.

ECCC Recommendation(s)

ECCC recommends that the rock samples that have NPR less than 2, not be used for construction, given that they may be capable of generating acid rock drainage.

ECCC further recommends that the Proponent use the conventional classification scheme detailed in the MEND report 1.20.1 , where all samples with $1 < \text{NPR} < 3$, should be classified as 'uncertain'.

3. Geotechnical Recommendations

Reference(s)

- Part 1, Section: 4 Design and Operation Considerations, Appendix E: Geotechnical Inspection Report, B2Gold Back River Project, 2023 Annual Report for Water Licence 2AM-BRP1831, April 2024
- Section 5.2.14 Goose Airstrip and Access Road, Appendix E: Geotechnical Inspection Report, B2Gold Back River Project, 2023 Annual Report for Water Licence 2AM-BRP1831, April 2024

Comment

Section 4 of the Geotechnical Inspection Report states that "Goose airstrip extension to the South is currently in progress. As this airstrip extends to the south, it intersects some more notable surface water flow pathways / ephemeral streams (Figure 5)."

Section 5.2.14 of the Geotechnical Inspection Report states that "It should be noted that the southern extension of the airstrip is in a low lying area with numerous natural small ponds and ephemeral stream flow paths"

Section 4 of the Geotechnical Inspection Report then goes on to state that "The South end of the extended Goose Airstrip is expected to be an area that will need to be closely monitored and more permanent long term water conveyance through portions of the airstrip should be considered by site (again depending on the length and use of the airstrip that site is targeting)."

ECCC notes that the findings from the inspection indicate that the southern end of the airstrip intersects some more notable surface water flow pathways / ephemeral streams. It is not clear to ECCC whether the recommendations mentioned in the report, will be implemented by the Proponent, and if the runoff from the south extension of the airstrip will be monitored.

ECCC Recommendation(s)

ECCC recommends that the Proponent implement the Geotechnical Inspection Reports' recommendation, that the runoff from the south extension of the airstrip be monitored.

4. Landfill Water Management

Reference(s)

- Section: 5.2.1: Goose Quarry, Appendix E: Geotechnical Inspection Report, B2Gold Back River Project, 2023 Annual Report for Water Licence 2AM-BRP1831, April 2024
- , B2Gold Back River Project, 2023 Annual Report for Water Licence 2AM-BRP1831, April 2024

Comment

Section 5.2.1 of the Geotechnical Inspection Report states "Development of the pit was started in 2021 to provide the Non Potentially Acid Generating (NPAG) Run of Mine (ROM) material for the site, but since the Echo Pit pre-stripping development was initiated in 2022, there has been no notable activity at the Goose quarry. As a result, the former Goose quarry is currently being used as a temporary landfill / storage site with long term plans of relocating all temporarily placed landfill material within the limits of a waste dump (as permitted)."

ECCC was unable to find reference to applicable water management practices or plans, for runoff or seepage out of the quarry, given that it is now used as landfill.

ECCC Recommendation(s)

ECCC recommends that the Proponent provide, and reference in the Geotechnical Inspection Report, any applicable plans for the management of water runoff and/or seepage from the Goose Quarry landfill, for review with the 2023 Annual Report.

5. Ponded Water Recommendation

Reference(s)

- Section: 5.2.3 Overburden Stockpile, Appendix E: Geotechnical Inspection Report, B2Gold Back River Project, 2023 Annual Report for Water Licence 2AM-BRP1831, April 2024

Comment

Section 5.2.3 of the Geotechnical Inspection Report states that "The ponding water was observed in areas the toe of the stockpiles. This is likely in part from the release of water from the overburden soil due with the high ice and water content as the outside layers of the stockpile thaw in the warmer months. It would be suggested collect water samples from

the ponded water around this area to better characterize (in terms of water quality, e.g. Total Suspended Solids (TSS), salinity, ammonia etc..).”

It is unclear to ECCC whether the Proponent intends to implement the Geotechnical Inspection Reports’ recommendation, to collect water samples from the ponded water and characterize it.

ECCC Recommendation(s)

ECCC recommends that the Proponent implement the Geotechnical Inspection Reports’ recommendation, to collect water samples from the ponded water and characterize it.

6. List of Hazardous Substances On-Site

Reference(s)

- Section 9.4: Hazardous Materials On-Site, Back River Project, Spill Contingency Plan, Version #4.0, February 2024
- Section 3.1: Overview, Appendix E: Geotechnical Inspection Report, B2Gold Back River Project, 2023 Annual Report for Water Licence 2AM-BRP1831, April 2024
- *Environmental Emergency Regulations*, 2019 (link: <https://laws.justice.gc.ca/PDF/SOR-2019-51.pdf>)
- Application for MLA Tank Farm Modification (Phase 3: Addition of Tank 5), B2Gold Nunavut, May 28, 2024

Comment

Section 9.4 of the Spill Contingency Plan, states that “A list of the main hazardous materials to be transported to and stored on-site is provided within the Hazardous Materials Management Plan (HMMP).” However, the only HMMP that ECCC could locate, dates back to November 2015 and does not provide an accurate account of the hazardous substances currently stored on-site. This information is necessary to evaluate if the Proponent has appropriate preparedness and response measures in place and compliance with the *Environmental Emergency Regulations* (E2 Regulations).

Additionally, with the recent construction and ongoing construction of large storage tanks, and significant infrastructure at the Project sites, it is unclear what fuels or hazardous substances are stored, and in what quantities.

ECCC Recommendation(s)

ECCC recommends that the Proponent provide an updated account of all hazardous substances stored at the various Project sites in the Spill Contingency Plan. This should include detailed information on the location, volume/mass, types of containment, and number of containers for each hazardous substance.

7. Response to Worst Case Scenario of Table 9-1

Reference(s)

- Table 9-1: Diesel Fuel Spill – Worst Case Scenario in Container, Back River Project, Spill Contingency Plan, Version #4.0, February 2024

Comment

Table 9-1 indicates that in the 'Potential Loss' situation, where "10 million liters [of diesel is] released into bulk fuel secondary containment catchment where it would be captured in full" that the product would be recovered "with sorbents or skimmer."

It is unclear from the information presented, whether the Proponent possesses enough sorbents to respond to a spill of this magnitude, or if other recovery methods will be utilized in conjunction with the use of sorbents and skimmers.

ECCC Recommendation(s)

ECCC recommends that the Proponent provide clarification in Table 9-1 of the Spill Contingency Plan, on whether the recovery methodology to be used in response to the scenario of a 10 million litre diesel spill, includes only sorbents or skimmer, or sorbents and skimmer in conjunction with other recovery methods.

8. Responsibility Under the E2 Regulations

Reference(s)

- Section 9.3.1.1: Identification and Assessment of Diesel Environmental Emergency Scenarios, Back River Project, Spill Contingency Plan, Version #4.0, February 2024
- Section 3.1, p.3, Appendix E: Geotechnical Inspection Report, B2Gold Back River Project, 2023 Annual Report for Water Licence 2AM-BRP1831, April 2024
- *Environmental Emergency Regulations*, 2019 (link: <https://laws.justice.gc.ca/PDF/SOR-2019-51.pdf>)
- Application for MLA Tank Farm Modification (Phase 3: Addition of Tank 5), B2Gold Nunavut, May 28, 2024

Comment

Section 9.3.1.1 of the Spill Contingency Plan states that "Project diesel containment volumes and maximum quantities necessitate additional and specific consideration of potential diesel spills per the Environmental Emergency Regulations (E2)."

With the progress on the construction of the tank farms, ECCC would like to bring to the attention of the Proponent, that a 'notice of change' may be required as stipulated in subsection 3(5) of the *Environmental Emergency Regulations*, 2019, which state:

"A responsible person must, within 60 days after the day on which any of the following situations occurs, submit an updated notice to the Minister that contains the information referred to in Schedule 2:

- (a) the information that was reported under section 1 or 2 of Schedule 2 has changed;
- (b) the maximum expected quantity that was most recently reported under paragraph 3(d) of Schedule 2 in respect of a substance has increased by 10% or more; or
- (c) the maximum capacity that was most recently reported under paragraph 3(f) of Schedule 2 in respect of a container system, in which a quantity of a substance is contained, has increased by 10% or more.”

ECCC Recommendation(s)

ECCC recommends that the Proponent submit an updated ‘notice of change’, if a situation covered under subsection 3(5) of the Environmental Emergency Regulations occurs.

This recommendation was also provided in ECCC’s comments, dated June 24, 2024, for the review of the Marine Laydown Area (MLA) Tank Farm Modification Request on the Back River project.

9. Description of Spill Event

Reference(s)

- Section 2.11: A List of Description of All Unauthorized Discharges Including Volumes, Spill Report Line Identification Number and Summaries of Follow-Up Actions Taken, B2Gold Back River Project, 2023 Annual Report for Water Licence 2AM-BRP1831, April 2024
- Appendix G: Spill Records, B2Gold Back River Project, 2023 Annual Report for Water Licence 2AM-BRP1831, April 2024

Comment

Appendix G of the 2023 Annual Report, indicates that a spill of 5000 L of ‘Petroleum lubricating oil’ occurred on the winter ice road on January 22, 2023. However, details regarding the cause of the spill, or if appropriate mitigation measures have been implemented to minimize the risk of future releases of this magnitude, are not provided.

Generally, a description of the events and circumstances surrounding a spill is necessary to analyze if the appropriate measures were taken in response. This helps ensure that effective steps are implemented to prevent similar incidents in the future.

ECCC Recommendation(s)

ECCC recommends that the Proponent update the 2023 Annual Report, to include a description of the events that led to the release of 5000 L of ‘Petroleum, lubricating oil’, and the corresponding measures taken to prevent future releases of this magnitude.

ECCC further recommends that future annual reports include both:

- Copies of spill reports; and
- Descriptions of spill events, including circumstances surrounding any spill events, and follow-up measures taken to mitigate future similar incidents.

10. Reported Residual Oil in Geotechnical Report

Reference(s)

- Image M-43, Appendix E: Geotechnical Inspection Report, B2Gold Back River Project, 2023 Annual Report for Water Licence 2AM-BRP1831, April 2024

Comment

The Description of Image M-43, in Part 4 of the Geotechnical Inspection Report, states that “Oil was noted at the surface of the ponding water”. ECCC is unclear from the information provided in the report, if the location was cleaned following the inspection.

ECCC Recommendation(s)

ECCC recommends that the Proponent clean-up the oil observed in Image M-43 of the Geotechnical Inspection Report, if this already hasn't been completed. ECCC further recommends that the Proponent implement procedures to help make sure that all future dismantling of secondary containments is completed without releasing the residual oil.

If you need more information, please contact Stephinie Mallon at Stephinie.Mallon@ec.gc.ca.

Sincerely,

[original signed by]

Stephinie Mallon
Environmental Assessment Officer

cc: Eva Walker, Head, Environmental Assessment North (NT and NU)