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MEMO

From	Merle Keefe
To	Richard Dwyer
Ref.	2AM-BRP1831
Date	14 May 2024
Subject	Llama and Umwelt Dewatering Plan – Responses to Review Comments

Dear Mr. Dwyer,

Thank you for the opportunity to respond to comments received on the Updated Back River Project (Project) Llama and Umwelt Dewatering Plan submitted under Water Licence 2AM-BRP1831 (the Licence). Responses were received from the Kitikmeot Inuit Association (KIA), Environment and Climate Change Canada (ECCC), Fisheries and Oceans Canada (DFO), and Crown Indigenous Relations and Northern Affairs Canada (CIRNAC).

B2Gold Nunavut would also like to correct the frequency of Sublethal testing indicated in Table 8.1-1 of the Dewatering Plan (v 1.1) to directly align with the requirements of Water Licence 2AM-BRP1831, which requires sublethal testing once during dewatering.

B2Gold Back River Corp. (B2Gold Nunavut) thanks all parties for their review of our submission and provides responses below.

Sincerely,

Merle Keefe
Manager, Environment
B2Gold Nunavut

cc: Kristina Benoit, Manager, Environmental Permitting, B2Gold Nunavut

Interested Party:	**Kitikmeot Inuit Association (KIA)**	**TRC NO.:**	**KIA-NWB-01**
Re:	**Fish Screens**		

KIA's Comment:

Hello Richard, the responses to KIA's comments are acceptable. However, the KIA did not find B2Gold Nunavut's response to DFO-NWB-02 and DFO-NWB-06 to be adequate for the following reasons.

Response states fish screens will be used only in water bodies that support fish, and that Llama Lake and Umwelt Lake had all fish removed.

Issue pertains to the fact that fish-out programs cannot guarantee 100% of fish are captured, so monitoring must take place during dewatering to identify and remove any remaining fish. This includes using fish screens to prevent entrainment or impingement of fish.

B2Gold Nunavut Response:

B2Gold Nunavut appreciates the KIA's concern and will ensure the dewatering pipelines are equipped with fish screens that prevent the impingement or entrainment of fish.

Interested Party:	**Environment and Climate Change Canada (ECCC)**	**TRC No.:**	**ECCC-NWB-01**
Re:	**Stage 3 Water Management**		

ECCC's Comment:

Based on the information provided in the Proponent responses labelled ECCC-NWB-01 and ECCC-NWB-02, ECCC considers this comment resolved.

B2Gold Nunavut Response:

Acknowledged.

Interested Party:	**Environment and Climate Change Canada (ECCC)**	**TRC No.:**	**ECCC-NWB-02**
Re:	**Correction**		

ECCC's Comment:

ECCC would like to note that a response was not provided for this comment in the Response to Reviewers Comments document, so both the comment and recommendation remain.

ECCC's previous comment was:

Section 4.0 of the Dewatering Plan states, "During Stage 1 and 2 of discharge, compliant water (whether raw or treated, respectively) from Llama and Umwelt lakes and tributary ponds will be discharged to Goose Lake. This water will not require treatment to meet discharge criteria."

ECCC notes that as per Section 2.0 of the plan, Stage 2 of dewatering does include treatment, and therefore the final sentence of this statement is contradictory.

ECCC Recommendation(s)

ECCC recommends that the Proponent remove or clarify the statement "this water will not require treatment to meet discharge criteria" when referring to Stage 2 of dewatering.

B2Gold Nunavut Response to ECCC-2:

B2Gold Nunavut apologizes for inadvertently omitting responses to this comment. B2Gold Nunavut confirms that this incorrect sentence stating "this water will not require treatment to meet discharge criteria" was removed from the Updated Dewatering Plan (v1.1) submitted with the previous round of comment responses.

Interested Party:	**Environment and Climate Change Canada (ECCC)**	**TRC No.:**	**ECCC-NWB-03**
Re:	**Dewatering Schedule**		

ECCC's Comment:

ECCC would like to note that a response was not provided for this comment in the Response to Reviewers Comments document, so both the comment and recommendation remain.

ECCC's previous comment was:

Section 4.0 of the Dewatering Plan states, "Water from Llama Lake and the tributary ponds will likely be discharged to Goose Lake via Umwelt Lake, which is the natural downstream waterbody from Llama Lake and upstream waterbody from Goose Lake."

This statement provides the first mention of the potential order of dewatering, and that Llama may be dewatered via Umwelt Lake. Given that this has not been described further, it is unclear whether the lakes are to be dewatered simultaneously or staggered. Additional details on the schedule of planned dewatering should be provided.

ECCC Recommendation(s)

ECCC recommends that the Proponent provide additional details on the schedule for dewatering including order that lakes will be dewatered, flow paths, and timing.

B2Gold Nunavut Response to ECCC-3:

B2Gold Nunavut apologizes for inadvertently omitting responses to this comment. B2Gold Nunavut confirms that it included additional information on the schedule for dewatering, including the order in which the lakes will be dewatered, flow paths, and timing, in the 'Updated Dewatering Plan' (v.1.1), which was submitted with the previous round of comment responses. In that submission, B2Gold Nunavut also provided information in response to a similar question from DFO, in DFO-1.

The provided information indicates that dewatering of both lakes is intended to occur simultaneously over the dewatering period, with Llama Lake being dewatered into Umwelt Lake (via Llama Outflow) while Umwelt is being dewatered simultaneously (or allowed to naturally overflow – see response to 'CIRNAC-1') via the natural discharge pathway to Goose Lake. However, should one of these lakes (e.g., Llama or Umwelt) develop water quality that is not compliant with discharge criteria, or approaches criteria thresholds, the other lake (Llama or Umwelt) may continue to be dewatered individually to Goose Lake, via discharge to the natural drainages between Umwelt Lake and Goose Lake.

In Figure 3 of the 'Updated Dewatering Plan', the point of entry (discharge) into Goose Lake is at the extreme western extent of Goose Lake. The entry of this water will be conveyed via the natural drainage depicted on the map, which includes all water from both Llama and Umwelt lakes, as well as other drainages which commingle prior to entry into Goose Lake. The blue-dashed lines on Figure 3 running along the Llama and Umwelt Lakes Outflow indicate the approximate dewatering pathway, with water continuing on to Goose Lake from the point of discharge.

B2Gold Nunavut also noted in the Updated Dewatering Plan, that, if dewatering was not completed by the end of 2024, it may be resumed in 2025.

Interested Party:	**Environment and Climate Change Canada (ECCC)**	**TRC No.:**	**ECCC-NWB-04**
Re:	**Dewatering Schedule**		

ECCC's Comment:

ECCC would like to note that a response was not provided for this comment in the Response to Reviewers Comments document, so both the comment and recommendation remain.

ECCC's previous comment was:

Several monitoring locations are discussed in Section 6.1 of the Dewatering Plan, including, Llama Lake, Umwelt Lake, and dewatering discharge at point of release. The Dewatering Plan also refers to potential samples from the shore of Llama and Umwelt Lakes, as well as water quality in Goose Lake as part of the Aquatic Effects Monitoring Program (AEMP). ECCC notes that these sample locations are not depicted on the figures provided.

ECCC Recommendation(s)

ECCC recommends that the Proponent provide a figure that clearly outlines the monitoring locations associated with the dewatering program.

B2Gold Nunavut Response to ECCC-4:

B2Gold Nunavut apologizes for inadvertently omitting responses to this comment. In the 'Updated Dewatering Plan' (v1.1) submitted with the previous comment responses, B2Gold Nunavut clarified the sampling programs and locations in Section 8.1 of the Plan.

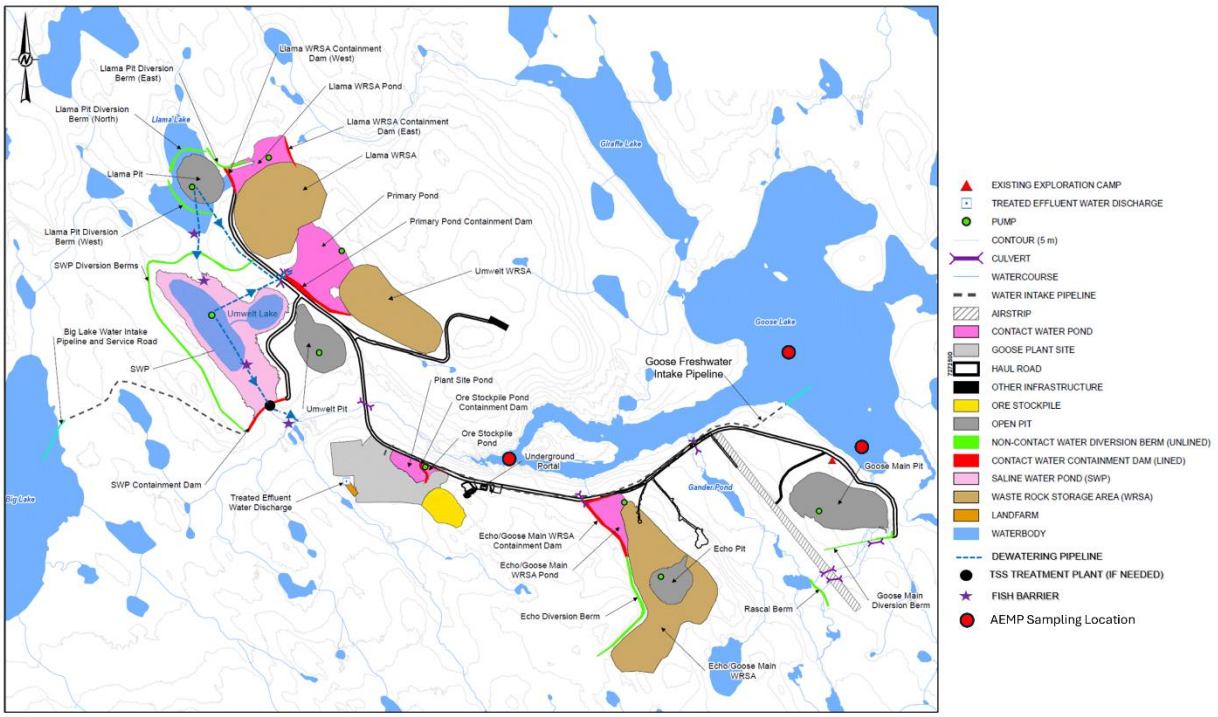
Sampling locations include those prescribed by the Water Licence:

- BRP-01 - Goose Lake Discharge; sampling of the dewatering discharge at the point of release to the drainages upstream of Goose Lake
- BRP-02 - Llama Lake; sampling of raw water when treatment is required, and
- BRP-06 - Umwelt Lake; sampling of raw water when treatment is required.

The location of BRP-01 will be determined in the field based on the discharge point used and would be reflective of the water being released. BRP-02 and BRP-06 samples would be collected from a sampling port in the water uptake line for each of these two lakes during pumping, as this would be the most representative of water being pumped. If water is not being actively pumped (such as during a pause to allow wind, or rain generated TSS to settle, or if water is being allowed to passively overflow from Umwelt Lake), shoreline or outflow samples may be collected at the most accessible location to determine raw water quality of Llama of Umwelt lakes.

Aquatic Effects Monitoring Program sampling locations have now been depicted in an update to Figure 3 of the Dewatering Plan, provided below.

Please also see response to ECCC-5 below.


Llama WRSA Containment Dam (West)
Llama Pit Diversion Berm (East)
Llama WRSA Pond
Llama Pit Diversion Berm (North)
Llama Lake
Llama WRSA Containment Dam (East)
Giraffe Lake
Llama WRSA
Llama Pit
Primary Pond
Primary Pond Containment Dam
Llama Pit Diversion Berm (West)
SWP Diversion Berms
Umwelt WRSA
Umwelt Lake
Goose Lake
Big Lake Water Intake Pipeline and Service Road
SWP
Goose Freshwater Intake Pipeline
Plant Site Pond
Ore Stockpile Pond Containment Dam
Umwelt Pit
Ore Stockpile Pond
Underground Portal
Goose Main Pit
SWP Containment Dam
Treated Effluent Water Discharge
Big Lake
Gander Pond
Echo/Goose Main WRSA Containment Dam
Echo Pit
Echo/Goose Main WRSA Pond
Goose Main Diversion Berm
Rascal Berm
Echo Diversion Berm
Echo/Goose Main WRSA
EXISTING EXPLORATION CAMP
TREATED EFFLUENT WATER DISCHARGE
PUMP
CONTOUR (5 m)
CULVERT
WATERCOURSE
WATER INTAKE PIPELINE
AIRSTRIP
CONTACT WATER POND
GOOSE PLANT SITE
HAUL ROAD
OTHER INFRASTRUCTURE
ORE STOCKPILE
OPEN PIT
NON-CONTACT WATER DIVERSION BERM (UNLINED)
CONTACT WATER CONTAINMENT DAM (LINED)
SALINE WATER POND (SWP)
WASTE ROCK STORAGE AREA (WRSA)
LANDFARM
WATERBODY
DEWATERING PIPELINE
TSS TREATMENT PLANT (IF NEEDED)
FISH BARRIER
AEMP Sampling Location

Interested Party:	Environment and Climate Change Canada (ECCC)	TRC No.:	ECCC-NWB-05
Re:	TSS/Turbidity monitoring		

ECCC's Comment:

ECCC would like to note that a response was not provided for this comment in the Response to Reviewers Comments document, so both the comment and recommendation remain.

ECCC's previous comment was:

The water quality action levels provided in Section 6.2 apply only to discharge water quality, and include feedback based on measured TSS [total suspended solids] concentrations in the discharge water. However, there are no action levels proposed related to the receiving environment to monitor for potential erosion/scouring impacts due to increased volumes and flows.

ECCC Recommendation(s)

ECCC recommends that the Proponent provide updates to the Dewatering Plan, discussing planned TSS/turbidity monitoring in the receiving environment (Goose Lake), to monitor and respond to any water quality impacts related to the dewatering.

B2Gold Nunavut Response to ECCC-5:

B2Gold Nunavut apologizes for inadvertently omitting responses to this comment. It is difficult to apply the BRP-01 (the point of release of dewatering water) discharge criteria and action levels to Goose Lake itself, as natural flows and water quality will also contribute to total sediment suspension. This is particularly the case during freshet, where the risk of natural erosion/sediment suspension is naturally the highest, and dewatering volumes will only be contributing to approximately 10% of flows.

To address this potential issue, B2Gold Nunavut will implement quantitative trigger values to ascertain changes in water quality as it relates to total suspended solids (TSS) loading and turbidity (nephelometric turbidity unit (NTU)). This will be accomplished by monitoring water quality near the point of entry into Goose Lake from the Llama Watershed Outflow (which will include water being dewatered for TSS and turbidity daily over the two weeks before dewatering of the lakes begins. Doing so will establish a realistic baseline for naturally occurring sediment load and turbidity units before anthropic influence may potentially alter this balance.

Upon the commencement of lake dewatering, field personnel will monitor turbidity and TSS at the same location as baseline samples were collected near the point of entry into Goose Lake. Should data indicate an increase of 8 NTUs (turbidity) or 25 mg/L TSS, pumping will cease to allow confirmation of background conditions (in the absence of pumping) and/or to implement sediment and erosion prevention controls (e.g., deployment of 'insta berms', waddles, and or silt fencing).

Interested Party:	**Crown Indigenous Relations and Northern Affairs Canada (CIRNAC)**	**TRC No.:**	**CIRNAC-NWB-01**
Re:	**Dewatering Schedule**		

CIRNAC's Comment:

The Licensee provided clarification on the dewatering schedule for Llama and Umwelt Lakes:

• Dewatering of both lakes is intended to occur simultaneously over the dewatering period, with Llama Lake being dewatered into Umwelt Lake (via Llama Outflow) at the same time that Umwelt is being dewatered into Goose (via the natural discharge pathway to Goose);

• Should one of the lakes develop water quality which is not compliant with discharge criteria, or approach criteria thresholds, the other lake may continue to be dewatered individually to Goose Lake, via discharge to the natural drainages between Umwelt Lake and Goose Lake; and

• Dewatering may continue in 2025 if this activity is not completed by the end of 2024.

CIRNAC is seeking further clarification on the Licensee's proposed dewatering schedule, which appears to have changed. For instance, in a response to the Kitikmeot Inuit Association for the 2021 Annual Report for the Nunavut Impact Review Board, it was noted that:

"The dewatering of Llama Lake and Umwelt Lake are scheduled to occur in sequence; Llama Lake followed by Umwelt Lake. The water from Llama Lake dewatering will be pumped to Umwelt Lake, from where it will be overflow towards Goose Lake through the natural outlet of Umwelt Lake.

In the event that dewatering schedule requires to advance the dewatering of Llama Lake and Umwelt Lake concurrently, the water from Llama Lake dewatering will be discharged directly downstream of Umwelt Lake."

CIRNAC recommends that the Licensee explain why the dewatering schedule has changed and provide information that supported its decision-making in discharging water from Llama Lake to Umwelt Lake (i.e., instead of discharging water from Llama Lake directly downstream of Umwelt Lake).

B2Gold Nunavut Response to CIRNAC-1:

In both the 2021 description and the current Plan, water from Llama may be pumped to Umwelt (via Llama Outflow) or, if needed (e.g. if Umwelt Lake water quality does not meet discharge criteria), Llama Lake water may be pumped around Umwelt-to-Umwelt Outflow. The difference CIRNAC noted seems to be related to whether Umwelt Lake is allowed to passively overflow with the excess Llama Lake water or is actively pumped out at a rate equivalent to target discharge rate. B2Gold Nunavut does not believe there is a significant difference between these two options and would be just as willing to allow Umwelt to simply overflow naturally if Umwelt water levels permit it. As soon as Llama Lake dewatering pump rate slows below the target discharge rate, active pumping would be needed form Umwelt Lake to ensure dewatering stays on schedule. If Umwelt is allowed to passively overflow, sampling station BRP-01 (sampling of the dewatering discharge at the point of release to the drainages upstream of Goose Lake) would be at the outflow of Umwelt Lake.

Interested Party:	**Fisheries and Oceans Canada (DFO)**	**TRC NO.:**	**DFO-NWB-01**
Re:	**Fish**		

DFO's Comment:

DFO has reviewed the comments from the proponent and can confirm that the attached responses, address the comments adequately.

B2Gold Nunavut Response to DFO-1:

B2Gold Nunavut acknowledges DFO's acceptance of the responses provided, and thanks DFO for their separate clarification that confirmatory fish sampling is not required given the work done in 2023. B2Gold Nunavut confirms that we will collect the additional data requested by DFO to help inform DFO Science.