



KUDZ ZE KAYAH PROJECT

RESPONSE TO MINERAL RESOURCE BRANCH'S INFORMATION REQUEST

#5A ON BMC'S KZK QUARTZ MINING LICENCE APPLICATION

April 2024

BMC MINERALS LTD.

LIST OF ACRONYMS AND ABBREVIATIONS

AMP	Adaptive Management Plan
AMI	Adaptive Management Initiative
AEG	Alexco Environmental Group
BMC	BMC Minerals Ltd.
CDA	Canadian Dam Association
EMR	Yukon Department of Energy, Mines and Resources
EMSAMP	Environmental Monitoring, Surveillance, Reporting and Adaptive Management Plan
EMSRP	Environmental Monitoring, Surveillance and Reporting Plan
EQS	Effluent Quality Standard
GCMP	Ground Control Management Plan
IEE	Initial Environmental Evaluation
IPMP	Invasive Plant Management Plan
IR	Information Request
km ²	Square kilometre
KP	Knight Piesold Consulting
KZK	Kudz Ze Kayah
LTF	Land Treatment Facility
LoMWBM	Life of Mine Water Balance Model
LWMP	Lower Water Management Pond
m	Metre
MAC	Mining Association of Canada
MRB	Mineral Resources Branch
NHC	Northwest Hydraulic Consultants
OMS	Operation, Maintenance and Surveillance
QML	Quartz Mining Licence
RCP	Reclamation and Closure Plan
SOP	Standard Operating Procedure
TARP	Trigger Action Response Plans
TSF	Tailings Storage Facility
TSP	Total Suspended Particulate
UWMP	Upper Water Management Pond
WQO	Water Quality Objective
WL	Water Licence
WTP	Water Treatment Plant
YOY	Young-of-Year
YAAQS	Yukon Ambient Air Quality Standards
YG	Yukon Government

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1 INTRODUCTION

BMC Minerals Ltd. (BMC) submitted a Quartz Mining Licence (QML) application (the Application) to the Yukon Department of Energy, Mines and Resources (EMR) in August 2022. This Application included the management plans developed for the Kudz Ze Kayah Project (the Project) in consideration of the Yukon *Quartz Mining Act* and other relevant regulations and guidelines.

In July 2023, EMR Mineral Resources Branch (MRB) issued the *Quartz Mining Licence Application, Information Request 5 – Phase 5a Review* (MRB, 2023) informing BMC that MRB had completed an adequacy review of the Site Characterization Plan, Environmental Monitoring, Surveillance, Reporting and Adaptive Management Plan, and Water Management Plan. This adequacy review concluded that additional information is required to support review of these three monitoring plans, and included 84 specific Information Requests (IRs) and recommendations (IR5-1 through IR5-84).

This document provides BMC's responses to IR5-1 through IR5-84. These responses and related monitoring plan revisions were developed in consideration of the guidance materials highlighted in MRB (2023), and other relevant standards and guidelines. For clarity and ease of understanding, BMC has listed the information requests (IRs) from MRB's IR5a (in black text) followed by BMC's response (in blue text).

2 SITE CHARACTERIZATION PLAN

2.1 GENERAL

IR5-1: Update the Site Characterization Plan to include baseline data collected in all discipline areas up to and including August 2022. Where practical, include data collected in 2023 as well.

BMC Response: The Site Characterization Plan has been updated to include available baseline data through 2023.

IR5-2: Ensure the updated Site Characterization Plan is consistent with the 2023 Guidelines for Mine Waste Management Facilities, in particular appendices A and B.

BMC Response: BMC has reviewed the *Guidelines for Mine Waste Management Facilities* (Yukon, 2023), and where needed the Site Characterization Plan has been updated to be consistent with the document. Particular care has been taken to review and conform with the guidance provided in Appendix A and Appendix B of Yukon (2023).

2.2 CLIMATE, HYDROLOGY AND HYDROGEOLOGY

IR5-3: YG's WL Intervention recommendation 29 with respect to climate change modelling applies to our review of the Site Characterization Plan as well. The Site Characterization Plan is required to be updated to address the comments and observations raised in YG's Intervention.

BMC Response: The Site Characterization Plan has been updated to reflect Yukon Government's (YG) Water Licence (WL) Intervention Recommendation 29, pertaining to climate change being incorporated into the water balance model and Project Intensity-Duration-Frequency curves. Climate modeling has been updated in accordance with applicable guidance, including the *Guidelines for Mine Waste Management Facilities* (Yukon, 2023) and the *Guide on Climate Change Adaptation for the Mining Sector* (MAC, 2021).

The long-term precipitation and temperature estimates for the Project were updated to support updates to the *Baseline Watershed Model* (KP, 2024a) and the *Life of Mine Water Balance Model* (KP, 2024b). A discussion of the updated long-term climate is presented in the letter *Long-Term Climate Input for the Baseline Watershed Model* (KP, 2024c). These documents are provided as appendices to the Site Characterization Plan and the Water Management Plan.

The Project's climate change analysis was updated to support water balance modelling, and the methodology and results are presented in *Climate Change Forecasts Update* (KP, 2024d), provided as an appendix to the *Life of Mine Water Balance Model* (KP, 2024b). The development of the climate change predictions was conducted in accordance with Yukon (2023) and MAC (2021a). The water balance modelling (KP, 2024b) meets the expectations for water balance modelling outlined in Yukon (2023) and includes a model scenario that considers climate change to assess mine water management. Predictions of extreme climate, such as intensity-duration-frequency (IDF) curves, consider an uplift for climate change as recommended in Yukon (2023).

Given the observed and predicted rates of change in extreme rainfall events, any potential climate change effects during the Mine life are expected to be well within the uncertainty of the IDF values presented in the 2019 *Hydrology and Climate Analysis* report (KP, 2019). Nonetheless, as stated in KP (2019), *"It is generally expected by regulators and the public that climate change is addressed in peak precipitation and flow analyses, and a 10% to 20% climate change factor has evolved in engineering practice as a somewhat "de facto" standard to address this concern (EGBC, 2018). Therefore, a 15% uplift was applied to the return period precipitation values."*

To put this 15% value in the context of the IDF_CC tool, 100-year 24-hour precipitation values were generated with IDF_CC for future time periods of 2020-2050 and 2040-2070, then compared with a value based on historic conditions. The results of the IDF_CC analysis, presented in Table 2-1, are for an ensemble of global climate models recommended for Northern BC on the ClimateBC website (Mahony et al., 2022; Wang et al., 2016).

Table 2-1: Changes in the 100-year 24-hour Storm given Various Emissions Scenarios

Period	SSP1-2.6	SSP2-4.5	SSP5-8.5
2020-2050	13%	3%	-3%
2040-2070	12%	2%	17%

These results, which are for time frames that extend well beyond the anticipated KZK Mine life, indicate that the magnitude of extreme precipitation events is likely to increase for most emissions scenarios. However, as 15% is towards the upper end of the projected changes, no additional uplift to the Project values is considered appropriate.

Another point to consider is that Project closure will involve the draining and removal of all ponds and other hydrotechnical infrastructure, so there will be no need for closure spillways, ditches, or other "permanent" hydraulic structures that would require a design based on an extreme precipitation event for some future period. Furthermore, if the closure design is modified for some reason in the future, any potential climate change effects will be reassessed at that time based on the latest modelling developments and climate change predictions at that time.

IR5-4: Update the hydrogeological model following completion of the additional field work identified in YG's Intervention recommendation 16 and 17. If the field work required has already been completed include this in the updated Site Characterization Plan.

BMC Response: A detailed conceptual hydrogeological model has been developed and is provided as an appendix to the Site Characterization Plan.

BMC and multiple experienced mining hydrogeologists have reviewed the conceptual hydrogeological model and the current numerical hydrogeological model, including sensitivity analyses. It has been concluded that confidence in model predictions is adequate to support the proposed mine water management procedures, and that those procedures, coupled with the Adaptive Management Initiative (AMI) for mine dewatering, are appropriately conservative to

ensure that potential variations in mine dewatering rates do not result in unacceptable environmental impacts.

BMC intends to complete some of the recommended field investigation in the summer of 2024. The conceptual and numerical hydrogeological models will be updated as more information becomes available from this field investigation, and prior to, and during, Project construction and operation. Updated model predictions will be used to optimize design of the mine dewatering system and the Water Treatment Plant (WTP), to improve characterization of mine dewatering risks and required mitigations, to revise the Environmental Monitoring Surveillance, and Reporting Plan (EMSRP) and Adaptive Management Plan (AMP) as appropriate, and to guide the development of future hydrogeological field investigations.

IR5-5: Update the Site Characterization Plan to incorporate the conceptual site models required in MRB's IR1-1 and YG's Intervention recommendation 18 and the numerical model in YG's Intervention recommendation 19.

BMC Response: The Site Characterization Plan has been updated to incorporate the Conceptual Site Model discussed in IR1-1, the hydrogeological conceptual model discussed in YG's Intervention Recommendation 18 (also referred to as a Conceptual Site Model) and the numerical groundwater model.

IR5-6: Update the Site Characterization Plan to incorporate the climate modelling required in MRB's IR1-2.

BMC Response: Climate modeling has been updated in the Site Characterization Plan in accordance with applicable guidance, including the Guidelines for Mine Waste Management Facilities (Yukon, 2023) and the Guide on Climate Change Adaptation for the Mining Sector (MAC, 2021). Updated climate modeling results, including climate change predictions, are provided as appendices in the Site Characterization Plan.

IR5-7: The LOMWB references a "Hydrometeorology Analysis Report (KP, 2019a)" but also refers to a "Hydrology and Climate Analysis Report (KP, 2019A)". Please confirm if Site Characterization report, Appendix B: 2019 Hydrology and Climate Analysis, is the same reference as in the LOMWB. If not, please provide a copy of that report.

BMC Response: The reference to "Hydrometeorology Analysis Report" was an error and should have referred to the "Hydrology and Climate Analysis Report".

IR5-8: YG's Intervention comments 23 and 25 with respect to the hydrometeorology baseline applies to our review of the Site Characterization Plan as well. A response to these comments along with requisite updates to the Site Characterization Plan is required from BMC.

BMC Response: Regarding YG's Intervention comment 23, BMC appreciates that accurately measuring precipitation in the north can be a challenge and understands that precipitation data reported at regional climate stations may have issues and need to be interpreted with caution. The

long-term precipitation series developed for the Project and input to the Life of Mine Water Balance Model (LoMWBM) is based on the precipitation record from the Faro regional climate station(s). The Faro regional precipitation data was reviewed to identify and exclude data that were questionable from being carried forward in the analysis. Calculation of the long-term synthetic precipitation series is described in the 2023 Baseline Watershed Model Update (KP, 2024a) for the updated water balance modelling conducted in 2023 and 2024.

Regarding YG's Intervention comment 25, BMC appreciates the identification of additional regional stations with smaller catchments. However, the Rose River and Blind Creek gauges have drainage areas of greater than 900 km² and 600 km², respectively, so these datasets are unlikely to materially improve the analysis. The two Tom Creek gauges have respective drainage areas of greater than 400 km², so are also not expected to materially improve analyses. The most applicable and relatively long-term dataset available is that for the Vangorda Creek gauge, which has a drainage area of 91 km². BMC has reviewed and interpreted the long-term daily flow records for this gauge, as summarized in Table 2-2.

The hydrometric analysis utilizes the regional Water Survey of Canada flow records as well as site-specific flow records for seven gauges with drainages ranging in size from 1.9 km² to 210.7 km². The streamflows collected at the Project gauging stations were used to calibrate the Baseline Watershed Model that was used to generate long-term flows for these seven gauges based on inputs of long-term temperature and precipitation.

The only hydrometric analysis for the Project that relies solely on Water Survey of Canada regional flow data is the peak flow analysis, which is primarily based on a regional flood scaling study prepared by Janowicz (1986). 10-year (Q_{10}) and 100-year (Q_{100}) peak flow values for the five smallest watersheds in the Water Survey of Canada regional dataset were superimposed on the scaling relationships developed by Janowicz (1986), and these were found to support the use of the Janowicz regional curves. Furthermore, a recent study of peak flows in Yukon prepared for YG (Northwest Hydraulic Consultants Ltd. (NHC), 2023), indicates return peak flow estimates that are slightly lower but generally consistent with the values calculated for the Project, as demonstrated in Table 2-2. Design flood values based on the frequency analysis of the 30-year peak instantaneous flow record for Vangorda Creek, are also included in the table. Vangorda Creek has a drainage area of 91 km², so the values were scaled for each of the station locations using the scaling exponents developed by NHC. These values also indicate that the estimated peak flows for the Project are appropriately conservative.

Table 2-2: Comparison of Project Peak Flows Calculated using Different Methods (l/s)

Station	Area (km ²)	Q ₁₀			Q ₁₀₀		
		NHC	Vangorda	KP	NHC	Vangorda	KP
KZ-13	7.9	1.52	1.33	1.73	3.36	3.12	3.69
KZ-2	1.9	0.42	0.37	0.46	1.00	0.93	1.09
KZ-9	16.4	2.93	2.57	3.40	6.25	5.82	6.90
KZ-15	60.9	9.55	8.36	11.41	19.08	17.76	21.18
KZ-16	35.0	5.80	5.08	6.84	11.91	11.09	13.19
KZ-22	162.4	23.08	20.21	28.20	43.96	40.93	48.99
KZ-26	210.7	29.17	25.55	35.87	54.87	51.08	61.20

IR5-9: Responses to information request 22 and 24 of YG's Intervention may have an impact on the material submitted in support of the QML application. If BMC alters any plans or supporting information as a result of interventions filed with Yukon Water Board, updated plans should also be filed with Mineral Resources Branch along with a concordance table describing any changes.

BMC Response: Responses to Information Requests 22 and 24 of YG's Intervention will be provided in BMC's response to YG's Intervention. All updated management plans and supporting information filed with Mineral Resources Branch include revisions resulting from interventions filed with the Yukon Water Board. All management plans include a Table of Revisions describing any changes related to Interventions (for the Type A Water Licence Application) and Information Requests (for the Quartz Mining Licence Application), and a Table of Concordance. The Table of Concordance include commitments made by BMC during the Yukon Environmental and Socio-economic Assessment Board's Screening Assessment, commitments made by BMC to Ross River Dena Council and Liard First Nation during their independent Project reviews, and relevant Decision Document Commitments.

IR5-10: Response to IR5-8 and IR-9 may also have an impact on the classification and design of the mine waste management facilities, particularly the Class A, and may require additional consideration when responding to Information Request 1 issued by Mineral Resources Branch on April 20, 2023.

BMC Response: All relevant information has been considered when updating the classification of the mine waste management facilities, as summarized in the KZK Waste Storage Facilities Classification Review (KP, 2024e), provided as an appendix to the updated Tailings Management Plan. This is reflected in BMC's response to YG's Mineral Resource Branch's (MRB) Information Request 1.

IR5-11: The updated Site Characterization Plan must include an inventory of anticipated emissions related to energy, electricity generation, and fuel, in line with Yukon's annual reporting requirements for quartz mines concerning greenhouse gas emissions.

BMC Response: According to Yukon (2013), a Site Characterization Plan "summarizes the environmental conditions for areas that are, or will be, affected by all aspects of a mining operation," and is not intended for reporting anticipated future conditions. Thus, an emissions inventory has not

been added to the Site Characterization Plan, but this information has been provided in Table 2-3 and BMC has committed to tracking and reporting this information, as detailed in Chapter 11 of the EMSRP.

Table 2-3: Anticipated Project Emissions

Parameter	Units	Total	Y-1	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8
CO ₂	t CO ₂	701,561	10,887	56,894	101,794	104,433	108,550	86,581	89,438	82,876	60,110
CH ₄	t CH ₄	88	0	4	12	12	13	12	13	13	10
N ₂ O	t N ₂ O	34	1	3	6	6	6	4	4	3	2
Convert to CO ₂ -e											
CO ₂	t CO ₂ -e	701,561	10,887	56,894	101,794	104,433	108,550	86,581	89,438	82,876	60,110
CH ₄	t CO ₂ -e	2,475	8	121	335	328	358	342	353	358	272
N ₂ O	t CO ₂ -e	8,981	201	687	1,493	1,562	1,516	1,015	1,057	881	568
Total	t CO ₂ -e	713,017	11,096	57,701	103,622	106,323	110,424	87,938	90,848	84,115	60,950

2.3 GEOLOGICAL, GEOTECHNICAL AND SEISMICITY

IR5-12: The geotechnical report required in MRB's IR1-3 is required to be incorporated into the updated Site Characterization Plan.

BMC Response: Geotechnical data and analyses have been summarized in a site characterization report (KP, 2024f), developed in accordance with the *Site Characterization for Dam Foundations in BC guideline* (APEG BC, 2016), provided as Appendix O of the Site Characterization Plan. Individual geotechnical reports, providing details of investigations, including detailed borehole logs, laboratory testing results and instrumentation are provided as Appendix P of the Site Characterization Plan.

IR5-13: The geological model required in MRB's IR1-5 is required to be incorporated into the updated Site Characterization Plan.

BMC Response: A site-wide 3D geological model was developed using *Leapfrog Geo* software, in accordance with the *Site Characterization for Dam Foundations in BC guideline* (APEG BC, 2016). Results of this model were used in developing a site characterization report (KP, 2024f), provided as Appendix O of the Site Characterization Plan.

IR5-14: Site-specific site characterization reports required in MRB's IR1-6 for the waste rock and tailings management facilities are not required to be included in the updated Site Characterization Plan but could be appended for completeness.

BMC Response: A site characterization report was developed, including site-specific foundation details for each mine waste facility, in accordance with the *Site Characterization for Dam Foundations in BC guideline* (APEG BC, 2016). This report is provided as Appendix O of the Site Characterization Plan.

BMC notes that APEG BC (2016) is intended to *'apply to site characterization for dam foundations during the various phases of development, from conceptual through to design, construction, design updates and closure.'* The proposed mine waste facilities at KZK include a filtered Tailing Storage Facility and waste rock storage facilities, none of which are impounded by a dam. The proposed KZK facilities have much lower potential consequences of failure than would a slurry TSF impounded by a dam, which is the type of facility that APEG BC (2016) is intended to apply to. Moreover, certain foundation characteristics have a high potential to induce a catastrophic failure of a slurry TSF impounded by a dam (such as the Mt. Polley TSF), but very little potential to induce a catastrophic failure of a filtered TSF or waste rock storage facility. These are important factors to consider when assessing the risk of KZK's waste storage facilities, and when developing appropriate risk-based designs for the facilities.

IR5-15: Provide the Terrain Stability and Hazards Mapping Report and Related Field Reconnaissance (Core and Associates, 2017b) referred to in the Site Characterization Plan and Appendix J.

BMC Response: The requested report has been provided as Appendix R of the Site Characterization Plan, and an updated permafrost characterization report (Palmer, 2023) has been provided as Appendix Q of the Site Characterization Plan.

IR5-16: The Site Characterization Plan uses the 2015 National Building Code Seismic Hazard Calculation; Natural Resources Canada revised this guidance in 2020. Complete a seismic hazard assessment using the 2020 guidance and include it in an updated Site Characterization Plan.

BMC Response: A site specific seismic hazard assessment has been developed using the 2020 guidance. The site specific seismic hazard assessment was used to confirm the stability of the proposed waste management facilities under seismic conditions and is provided as Appendix S of the Site Characterization Plan.

IR5-17: Responses to information request 38 and 39 of the Intervention may have an on the material submitted in support of the QML application. If BMC alters any plans or supporting information as a result of interventions filed with Yukon Water Board updated plans should also be filed with Mineral Resources Branch along with a concordance table describing any changes.

BMC Response: Responses to Information Requests 38 and 39 of YG's Intervention will be provided in BMC's response to YG's Intervention. All management plans and supporting information filed with Mineral Resources Branch include revisions resulting from interventions filed with the Yukon Water Board. All management plans include a Table of Revisions describing any changes related to an IR or Intervention, and a Table of Concordance.

2.4 WILDLIFE

IR5-18: Upon completion of the wildlife baseline data collection required in accordance with Decision Document term 11b, the timing of which is described in the June 20, 2023 letter from Department of Environment, the relevant sections of the Site Characterization Plan are required to be updated.

BMC Response: BMC confirms that the caribou section of the Site Characterization Plan will be updated with the additional data (per the timing outlined in YG Department of Environment's letter dated June 20, 2023). This commitment has been added to the caribou section of the Site Characterization Plan and has been included in the Table of Revisions for that plan.

2.5 VEGETATION

IR5-19: The Site Characterization Plan does not include a discussion on the current extent of invasive plants species in the project area. Appendix F provides information from 2015-2016, though with continued exploration and use of the area this may have changed. Include an updated invasive plant species inventory in the updated Site Characterization Plan.

BMC Response: The following text has been added to the vegetation section of the Site Characterization Plan:

"Invasive plant surveys were first completed in July 2015 by Alexco Environmental Group (AEG) on behalf of BMC. The survey confirmed that invasive weeds infestations had developed under the previous owner and BMC immediately implemented an Invasive Plant Management Plan (IPMP) for the Project. The IPMP contains protocols on identifying, preventing, and controlling the spread of invasive plants (Alexco Environmental Group, 2015). The IPMP was implemented during 2016 through 2020 field seasons. In 2021 and 2022 there was no exploration activity and thus no environmental monitors on site to implement the IPMP. In 2023 an extensive program was implemented. The 2023 Invasive Species Management Report has been added as an appendix to the Site Characterization Plan. The conclusions of the 2023 program are that there appears to be a notable increase in invasive plant populations from 23 to 66. This number should be interpreted cautiously as it is difficult to discern boundaries between sites as many occurrences are single to several individuals sporadically along the roadside. Defining the "beginning" and "end" of a site is not obvious. There was no exploration activity and thus no environmental monitors on site during the 2021 and 2022 seasons. This likely contributed to the increase in invasive plants over the three year period."

These revisions are included in the Table of Revisions of the Site Characterization Plan in response to this Information Request.

3 WATER MANAGEMENT PLAN AND WATER BALANCE MODEL

3.1 GENERAL

IR5-20: The Water Management Plan includes a list of regulations and guidelines that were used for the development of the plan. This list does not include the Yukon government issued guidance documents that are relevant including the 2021 guidance on adaptive management plans and 2021 guidance on water quality objectives and effluent quality standards. Provide confirmation that Yukon guidance documents were considered during the development of this plan, and that the proposed actions and outcomes are in conformity with those guidelines.

BMC Response: The following YG guidance documents were considered in the application and subsequent submissions:

- Yukon Government: *Guidelines for Mine Waste Management Facilities* (Yukon, 2023);
- Yukon Government and Yukon Water Board: *Reclamation and Closure Planning for Quartz Mining Projects, Plan requirements and closure costing guidance* (Yukon and YWB, 2013);
- Yukon Government: *Plan Requirement Guidance for Quartz Mining Projects* (Yukon, 2013);
- Yukon Water Board: *Sediment and Erosion Control Plan Guidelines* (YWB, 2018);
- Yukon Government: *Guidelines for developing adaptive management plans in Yukon, water related components of quartz mining projects* (Yukon, 2021a); and
- Yukon Government: *Yukon Guide for Developing Water Quality Objectives and Effluent Quality Standards for Quartz Mining Projects* (Yukon, 2021b).

The water quality objectives (WQO) and associated effluent quality standards (EQS) for the Project were calculated in a manner consistent with the 2021 Yukon Government guidance document regarding WQO and EQS development.

The Environmental Monitoring, Surveillance, Reporting and Adaptive Management Plan (EMSRAMP) was split into two documents:

- Environmental Monitoring, Surveillance, and Reporting Plan (EMSRP); and
- Adaptive Management Plan (AMP).

The AMP components of the EMSRAMP were moved into the AMP and updated based on Information Requests from MRB and Interventions from YG and Liard First Nation. The new AMP document was developed following the guidance provided in Yukon (2021a).

IR5-21: The dam classification summary provided in Table 4-1 needs to be reviewed and updated in accordance with the 2023 Guidelines for Mine Waste Management Facilities. Classification of the facilities, as defined in the 2023 Guide must be added to Table 4-1.

BMC Response: Dam classifications in the Water Management Plan have been updated in accordance with Yukon (2023), as detailed in KP (2024e), provided as Appendix B of the Tailings Management Plan.

IR5-22: The design events and criteria considerations for water management and conveyance infrastructure identified in Table 4-2 should be reviewed and updated in accordance with the 2023 Guidelines for Mine Waste Management Facilities.

BMC Response: The design events and management practices for all applicable water management infrastructure were reviewed and found to substantially conform with the guidance provided in Yukon (2023), given the classifications discussed in the KP (2024e). The only material non-conformance was related to risk assessment. As a result, BMC is now in the process of conducting an FMEA for the proposed waste management facilities, in collaboration with Yukon Government and Yukon Conservation Society. Ross River Dena Council and Liard First Nation were invited to participate, but have chosen not to respond to the invitations. FMEA summary reports are expected to be complete by May 2024, and will be provided as standalone documents upon completion, and included as appendices to the approved Tailings and Management Plan and Waste Rock and Overburden Management Plan.

IR5-23: Provide clarification and additional details on the “risk based approach” that was used when developing the storm water design criteria in section 4.2 of the WMP.

BMC Response: The risk-based approach taken to developing storm water design criteria in the Water Management Plan was based on the Canadian Dam Association (CDA) Dam Safety Guidelines (2013). For each dam, a consequence classification was determined based on consequences of failure, including loss of life, environmental and cultural values, and infrastructure and economics, as defined in CDA (2013). Design criteria for each dam were then selected using guidance in CDA (2013), depending on each dam's classification.

3.2 SITE WATER MANAGEMENT

IR5-24: Collection ponds are used for sediment removal in run off from the overburden and Class C facilities prior to water discharge to the environment. Provide clarification that the design of these collection ponds considers the accumulation of sediment without adversely impacting storage capacities.

BMC Response: The Class C Storage Facility and Overburden Stockpile Collection Ponds are sedimentation ponds designed to retain turbid water for a minimum duration, then release the clean water to the environment through a discharge pipe. Thus, sediment accumulation can occur without adversely impacting their performance or storm storage allowance.

IR5-25: If sediment accumulation was not included in the design of the collection ponds provide the monitoring and management methods that will be put in place to ensure sufficient capacity in these ponds are available.

BMC Response: As discussed in response to IR5-24, the Class C Storage Facility and Overburden Stockpile Collection Ponds are sedimentation ponds that consider the accumulation of sediment in their design and operation. Nevertheless, excessive sediment accumulation can impact their performance. Sediment depth will be measured regularly in these ponds and if the vertical distance from the discharge pipe to the top of sediment is less than 1 m, sediment removal procedures will be implemented, likely to include hydraulic or mechanical dredges. Sedimentation rates depend on many factors and are difficult to predict with certainty, but it is estimated that dredging of sediment in the Class C and Overburden Collection Ponds will be required infrequently during Project operations, if ever.

IR5-26: Section 6.2.1 states that the overburden dewatering trenches are expected to be approximately 15 to 20 m deep. Workplace Health and Safety Regulations³ have specific requirements with respect to trenches over 6 m deep (10.62-10.72) that must be adhered to when designing and constructing this infrastructure. Provide confirmation that the dewatering strategies conform with the regulations.

BMC Response: All aspects of the Project operation will be carried out in conformance with applicable Workplace Health and Safety Regulations. However, while these overburden dewatering structures have been referred to as 'trenches' in the Water Management Plan, they are not trenches as defined in Workplace Health and Safety Regulations, and will be designed and operated as the initial phase of the Project open pit, as discussed in the Open Pit Mine Development and Operations Plan.

IR5-27: Section 6.3.10 states that flows requiring treatment have the greatest potential to exceed water treatment plant capacity during freshet and the months that immediately follow and indicates that these flows may exceed the capacities of the plant. Consideration of this risk and adaptive management measures must be included in the Adaptive Management Plan required in IR-73.

BMC Response: An AMI related to WTP capacity has been added to the AMP. There are many potential management responses to elevated Stream 1 or Stream 2 WTP flows that can be rapidly implemented to ensure that discharge Effluent Quality Standards (EQS) and Water Quality Objectives (WQO) in Geona Creek and Finlayson Creek are met at all times.

IR5-28: Information requests with respect to the management of frozen materials were included in MRBs Phase 4 information request. Update Section 6.7 of the Water Management Plan with information on frozen materials management information to ensure consistency across management plans.

BMC Response: Discussion of frozen material management has been added to the Water Management Plan.

3.3 MAINTENANCE AND MONITORING STRATEGIES

IR5-29: Maintenance and monitoring strategies are described at a high level in Section 7 with reference to details being provided in the Environmental Monitoring, Surveillance, Reporting and Adaptive Management Plan. To avoid cross-referencing errors and requirement for frequent updates, BMC should consider removing this section.

BMC Response: Details of monitoring strategies have been removed from the Water Management Plan and added to the EMSRP.

IR5-30: Section 7 refers to an Operation, Monitoring and Surveillance manual being prepared for the project, and more specifically for water management infrastructure. These manuals must be prepared and submitted for review as a part of the QML application process.

BMC Response: As discussed with EMR (Scott Donaldson, personal communication), an Operation, Maintenance and Surveillance (OMS) Manual will be developed and provided to EMR prior to construction of water management infrastructure. This OMS Manual will be developed in accordance with Mining Association of Canada (MAC) (2019) and Yukon (2023) and will be reviewed annually or following a significant change in conditions or operations, and updated as required. Key information to be included in the OMS Manual has been summarized in the EMSRP and Water Management Plan. It is not typical and not practical to develop a comprehensive OMS Manual as part of Project permitting, as many details to be included in the OMS Manual are not yet known (e.g., Project staffing and organization, training procedures, succession plans, detailed design of ancillary facilities, equipment selection, maintenance requirements, etc.).

3.4 ADAPTIVE MANAGEMENT

IR5-31: The adaptive management strategies should be separated out of this plan and included in the stand-alone Adaptive Management Plan (AMP) required in IR5-73.

BMC Response: Adaptive management strategies have been separated out of the Water Management Plan and included in the stand-alone AMP.

IR5-32: The requests with respect to adaptive management throughout this information request must be included in the AMP and submitted as a part of the QML application.

BMC Response: All adaptive management strategies are included in the AMP.

IR5-33: Additional information on the mobile water treatment plant referred to in Table 8-1 is required in the Adaptive Management Plan. Specific triggers, action responses and outcomes (i.e., water quality objectives) with respect to the mobilization, commissioning and operation of a mobile water treatment plan are required.

BMC Response: An AMI related to water treatment plant capacity has been added to the AMP, including information on the potential use of a mobile WTP, with specific triggers, action responses

and intended outcomes. Detailed description of the mobilization, commissioning and operation of a mobile WTP is not provided, as flexibility in implementation of the AMI is necessary, and these details would depend on the specific conditions leading to the AMI trigger. Mobile WTPs are widely available to rent or purchase for a range of purposes that could be applicable to the Project at certain times.

IR5-34: Increasing discharge rates to the environment when management pond volumes are exceeded is included as an adaptive management strategy. Provide justification and additional detail on how Water Quality Objectives will be monitored and met when implementing these strategies and how they link to other strategies (i.e., capacities and throughputs of water treatment plants).

BMC Response: Increasing discharge rates from the Lower Water Management Pond (LWMP) to the environment is one potential response described for the AMI concerning Water Management Pond levels in the AMP. This response would only occur if increased discharge rates would meet the discharge ratios specified for the Project. The EMSRP describes how WQOs will be monitored and met at all times. There are multiple AMIs in the AMP concerning aspects of water quality and quantity management at the Project. None of these AMIs has direct linkages with the AMI for water quality in the downstream receiving environment, as none would entail discharging water from the LWMP in excess of EQS or discharge ratios, so do not pose a risk of exceeding WQOs. Each AMI includes multiple potential management responses to avoid exceeding thresholds without causing unacceptable impacts to the environment.

IR5-35: Directing non-compliant water from overburden stockpiles and the Class C facility to the upper and lower water management ponds is included as an adaptive management strategy. Confirm if the intended management practice is dilution of non-compliant water in the water management ponds to achieve water quality objectives prior to discharge to the environment.

BMC Response: An AMI specific to the detection of adverse water quality in the Overburden Stockpile and the Class C Storage Facility collection ponds is now included in the AMP. One of the potential responses for this AMI includes pumping water to the Upper Water Management Pond (UWMP) or LWMP, only if this can happen without exceeding EQS in the LWMP. Additional potential management responses are also presented.

3.5 WATER USE

IR5-36: Use of water from the lower water management pond for the purposes of dust control is included as an adaptive management measure. Provide clarification and additional information with respect to the expected water quality in this pond and its acceptability for this purpose, and alternative solutions for dust control when water is not of appropriate quality.

BMC Response: Water in the LWMP is expected to meet the EQS, so would be a suitable source for dust control purposes. LWMP water quality will be tested regularly as per the EMSRP. The AMI for discharge water quality would be triggered should water in the LWMP approach EQS, and management responses would be implemented to ensure that EQS are not exceeded. If this AMI is not successful and water in the LWMP does not meet EQS, potential alternative approaches to dust

control include using water from the UWMP, Overburden Stockpile or Class C Storage Facility collection ponds, or using one of the many other products commonly used for dust control.

3.6 LIFE OF MINE WATER BALANCE MODEL

IR5-37: Intervention comments 26 through 29 with respect to assumptions behind the water balance model and available water management methodologies may have an impact on mine development and operation. A response to these comments along with requisite updates to relevant management plans is required from BMC.

BMC Response: BMC has reviewed YG's Intervention comments 26 to 29 and has made a number of revisions to the LoMWBM and relevant management plans related to these comments. BMC will respond to these comments in a separate document prepared in response to YG's Intervention.

4 ENVIRONMENTAL MONITORING, SURVEILLANCE, REPORTING, AND ADAPTIVE MANAGEMENT PLAN

4.1 GENERAL

IR5-38: Prepare and submit a standalone Environmental Monitoring, Surveillance and Reporting Plan (EMSRP) for the construction and operation periods of the project that reflects the comments throughout this information request, previous information requests issued by Mineral Resources Branch and YG's WL Intervention.

BMC Response: A standalone Environmental Monitoring, Surveillance and Reporting Plan (EMSRP) has been developed, including updates in response to comments throughout this information request, previous information requests from MRB and YG's WL Intervention.

IR5-39: Monitoring needs to be clearly laid out with schedules for each monitoring method including who is responsible for the data collection and how data will be analyzed. A clear monitoring schedule will ensure adaptive management methods can be implemented appropriately.

BMC Response: Monitoring locations, frequencies, and responsibility for data collection and analysis are included in the EMSRP. Additional detail will be provided in some sections of the EMSRP in subsequent updates to the EMSRP once available, including more detailed roles and responsibilities and infrastructure monitoring procedures. This information is not yet available, and will be developed during Detailed Design. The EMSRP is a living document and will be updated regularly to incorporate new Project activities, permit conditions, use of new technologies and data from ongoing monitoring programs.

IR5-40: The plan does not include any discussion of wetland impacts, mitigations or monitoring. Update EMSRP to include characterization of the area and a map of wetlands to be disturbed during mining activities, and the avoidance, minimization and reclamation actions undertaken, as well as the area of reclaimed or constructed wetlands post-mining.

BMC Response: Baseline wetland conditions are discussed in the Site Characterization Plan and a detailed assessment of the impacts and mitigations of wetlands is included in BMC's Project Proposal (BMC, 2017). The EMSRP was developed based on YG and YWB guidance (Chapter 7 of *Plan Requirement Guidance for Quartz Mining Projects* (YG and YWB, 2013)), and monitoring of wetlands is described Chapter 12 of the EMSRP (as it relates to monitoring impacts to vegetation and ecological communities and associated progressive reclamation). YG and YWB (2013) does not require the EMSRP to discuss detailed impacts and mitigations and no other chapter in the EMSRP contains this information, so it has not been included for wetlands.

IR5-41: Standard Operating Protocols are referenced throughout the plan but are not included as appendices. In the updated EMSRP ensure all applicable Standard Operating Protocols are appended.

BMC Response: As discussed with EMR (Scott Donaldson, personal communication), the Standard Operating Procedures (SOPs) that are currently available have been included as appendices to the EMSRP. Other SOPs will be developed and provided to EMR prior to Project construction, as will OMS Manuals and a Ground Control Management Plan (GCMP).

Key information to be included in the OMS Manuals and GCMP has been summarized in the EMSRP. As discussed in BMC's response to IR5-30, it is not typical and not practical to develop all of these documents as part of project permitting, as many details to be included are not yet known (e.g., Project staffing and organization, training procedures, succession plans, design of intermediate pit phases, detailed design of pit dewatering and ancillary facilities, equipment selection, maintenance requirements, detailed monitoring requirements, emergency preparedness stakeholders and communication procedures, etc.).

IR5-42: Monitoring and reporting of project-related impacts on climate change are not included in the EMSRP. The updated EMSRP should include monitoring of scope I and II emissions (i.e., fuel use on site) and indirect scope II emissions (i.e., fuel for transportation of ore, emissions from mine waste). Reporting requirements should be consistent with the annual reporting requirements for quartz mines concerning greenhouse gas emissions.

BMC Response: Chapter 11 of the EMSRP has been updated to include monitoring and reporting of emissions.

4.2 AIR QUALITY

IR5-43: Ensure the ambient air quality standards being used and referenced throughout this section of the plan are those identified in Yukon Ambient Air Quality Standards.

BMC Response: Ambient air quality standards referenced in the EMSRP are those identified in Yukon Ambient Air Quality Standards (YAAQS) that come into effect January 1, 2025 (Yukon, 2024).

IR5-44: As required in Decision Document term and condition 37, ensure the ambient air monitoring plan bases all Criteria Air Contaminants on the 2025 YAAQS. This should also be included in the concordance table required at the front of each plan.

BMC Response: Ambient air quality standards referenced in the EMSRP are those identified in YAAQS that come into effect January 1, 2025 (Yukon, 2024). Condition #37 is included in the Table of Concordance of the EMSRP.

IR5-45: Predicted NO₂ concentrations presented in Table 4-10 of the air dispersion model report did not exceed the 2014 YAAQS however, when compared to the 2025 YAAQS, NO₂ exceedances are present in the construction, operation and closure phases. Update the EMSRP to include NO₂ within the suite of monitored contaminants to ensure proper responses are initiated under the adaptive management approach, should the predicted exceedances occur.

BMC Response: The suite of monitored air quality contaminants presented in Chapter 3 of the EMSRP has been updated to include NO₂.

IR5-46: Update the EMSRP to include continuous air quality monitoring to allow air quality to be viewed and assessed in real time, which will allow for adaptive management responses to be undertaken as necessary.

BMC Response: Chapter 3 of the EMSRP has been updated to include continuous monitoring of Total Suspended Particulate (TSP), PM₁₀ and PM_{2.5}.

IR5-47: Provide clarification on the standard presented for chromium in Table 3-2. Based on the standard presented, the chromium form presented in the table is metallic, divalent and trivalent and does not include hexavalent chromium.

BMC Response: The standard presented for airborne chromium in Chapter 3 of the EMSRP applies to chromium compounds (metallic, divalent and trivalent forms) only.

4.3 GROUNDWATER QUALITY AND QUANTITY

IR5-48: Monitoring and understanding groundwater quality and quantity is an important aspect for long-term stability of mine waste and water management infrastructure as well as understanding the effectiveness of containment methods for these facilities. The updated EMSRP must consider the recommendations identified in YG's Intervention #66.

BMC Response: YG's Recommendation 66, pertaining to groundwater monitoring of specific hydrogeological settings, has been addressed in Chapter 6 of the EMSRP.

IR5-49: Provide additional information regarding well locations and placement as this is integral to capturing representative data to support stability assessments. Consideration must be given to placement relative to mine infrastructure, depth, monitoring measures, and reporting.

BMC Response: Details of monitoring well locations, monitoring and reporting are provided in Chapter 6 of the EMSRP.

IR5-50: To ensure environmental monitoring is conducted in a manner that supports implementation of adaptive measures, continuous water level monitoring should be included in groundwater wells installed near mine waste management infrastructure or water conveyance and storage infrastructure.

BMC Response: Continuous water level monitoring will be performed at groundwater wells installed near mine waste and water management infrastructure, as detailed in Chapter 6 of the EMSRP.

IR5-51: There is an annotation on Figure 6-1 that refers to a "paste plant" on the southeast side of the ABM pit. From previous plan reviews, it was assumed that paste would be created in the process plant, and not have its own separate facility. Provide clarification on where the paste plant will be located and ensure the EMSRP includes appropriate monitoring measures relevant to its location.

BMC Response: The paste plant on Figure 6-1 was an error and has been removed. This plant will only be required for the underground mine component of the Project, which is currently not part of BMC's QML Application. A separate Underground Mine Development and Operations Plan will be issued to EMR for approval under the Quartz Mining License prior to development of the Underground Mine. This Plan will include the final proposed location of the paste plant. It will also include amendments to the Approved Plans (where required).

4.4 GEOCHEMICAL MONITORING

IR5-52: In the updated EMSRP include the following clarifications or corrections to open pit waste rock geochemical monitoring (section 7.4.1):

- a. The first point in the bulleted list in this section references waste rock boundaries. Will these boundaries be defined by use of a pit block model?
- b. Correct the reference to Table 3-3 in the fourth bullet.
- c. The fifth point in the bulleted list in this section references visual inspections and laboratory analysis. Provide clarification on the frequency of these inspections and analysis and the threshold for classification.
- d. The fifth point in the bulleted list in this section references "the latter", but only mentions one mafic volcanic unit. Clarify if there are multiple rock types that rely on visual monitoring.
- e. The sixth point in the bulleted list in this section references "the mining software package" but does not clarify what that is. Provide additional information on this software including ownership of any databases and reliance on third-party contracts to maintain and operate the software.
- f. The ninth point in the list references a laboratory QA/QC program. Provide additional details of this program.

BMC Response:

- a. It will be both. The pit block model will inform the waste rock classification boundaries, while geochemical analysis of closely spaced grade control drilling and blast hole sampling will confirm this. Chapter 7 of the EMSRP has been modified accordingly.
- b. This typo has been corrected.
- c. This is now clarified in the text. Cuttings will be collected from each open pit blast hole for waste rock classification purposes. One representative sample will be collected per hole for Ca and S determination using the site laboratory. Visual inspection will be part of the waste rock classification purposes in terms of identifying mafic volcanic (CA CL MAF) units that are Class B material.

- d. Only the mafic volcanic unit (CA CL MAF) is expected to be visually distinctive enough for visual classification. The text has been edited accordingly.
- e. Many commercial software platforms are available for geological block models. BMC and its consultants have used a variety of commercial software packages as appropriate for the task and the experience of the team. BMC owns the geological and geochemical data used to construct the model.
- f. Additional QA/QC information for the site lab analysis is included in Chapter 7 of the EMSRP, such as analysis of replicate splits (10% of samples) and analysis of certified reference materials to ensure data accuracy (in concert with external laboratory analysis on a subset of samples).

IR5-53: Section 7.5 refers only to annual reporting requirements. Reporting on adaptive management or response actions taken should also be included in this section, reporting requirements for different levels of response actions should be proposed by BMC in the updated EMSRP.

BMC Response: Reporting requirements have been added to Chapter 4 of the AMP, in accordance with the *Guidelines for Developing Adaptive Management Plans in Yukon* (Yukon, 2021a).

IR5-54: Section 7.5 should also reference that an analysis of the geochemical data collected will also be provided in the annual report.

BMC Response: Analysis of geochemical data has been added to annual reporting requirements in Chapter 7 of the EMSRP.

4.5 FISH AND AQUATIC RESOURCES

IR5-55: Proponent commitments with respect to the management of aquatic invasive species are not represented in the submitted EMSRAMP. The actions and measures identified in those commitments must be included in the updated EMSRP.

BMC Response: The Invasive Species Management Plan for the Project originally focused on prevention, control, and monitoring for terrestrial plants known to be invasive in Yukon (YISC, 2023). It has been updated to include aquatic invasive species of concern for Yukon (Leung and von Finster, 2016). The updated Invasive Species Management Plan has been provided as Appendix E of the revised EMSRP.

IR5-56: Update the EMSRP to expand monitoring and surveillance for fish and aquatic resources including spawning surveys for Arctic grayling in both Geona Creek and Finlayson Creek. This will add to the combined fish and aquatic monitoring program that is being conducted and allow for spatial comparison. This additional data will also help determine project effects or impacts on grayling spawning, and therefore juvenile success.

BMC Response: The monitoring study design for fish, fish habitat, and benthic invertebrates (hereafter the Fish and Aquatic Life Monitoring Program) has been updated in Chapter 8 of the EMSRP to facilitate temporal comparison of monitoring data, allow for the optimal detection of potential mine-related effects, and to support adaptive management for these monitoring components. The updates to the EMSRP include spawning surveys.

IR5-57: Increase in aquatic sediments and therefore total dissolved solids, can impact survivability of juvenile fish, as well as decrease spawning success. Section 8.3 of the EMSRP does not provide details of when samples were taken, in relation to predicting potential sediment during key spawning windows. Include additional detail on the temporal scale of when aquatic sediments are sampled to allow for a more accurate presentation of the impacts to the aquatic system.

BMC Response: A detailed description of the baseline sediment monitoring program is included in the Site Characterization Plan. Stream sediments were characterized in 1994 and 1995 by Cominco as part of the baseline studies for the Project in support of the Initial Environmental Evaluation (IEE) (Cominco, 1996). After a Type A Water Use Licence (WUL QZ97-026) for the Project was issued in 1999, collection and characterization of stream sediments was conducted every two years from 2000 to 2016 to meet the compliance monitoring requirements of the WL (Cominco, 2000; Laberge and Can-Nic-A-Nick, 2003 to 2017). Sediment sampling was also conducted in stream habitat in Finlayson Creek, Geona Creek, and Fault Creek in 2015 and 2016 to support the YESAB Project Proposal (AEG, 2016) and in 2017 and 2018 during baseline sampling to characterize lentic habitat in the vicinity of the Project (BMC, 2021). The stream locations where sediment quality was assessed from 1994 to 2016 and the associated years of sampling for each area are provided in the Site Characterization Plan. With regards to timing of sample collection, in 1994 and 1995 for the IEE, sediment samples were collected in July and September respectively, after which, sample collection to support WL compliance monitoring from 2000 to 2014 was completed in mid to late August of each monitoring year. In 2015 and 2016 sediment sampling was completed from September 9 to 11 and September 30 to October 4, respectively. Lentic sediments were sampled from August 5 to 8 and August 9 to 14 in 2017 and 2018, respectively. With regards to arctic grayling life history, the timing of sediment sampling has generally coincided with the period following emergence when young-of-year (YOY) would be expected to be free-swimming. Sampling proposed in the EMSRP is proposed for late August or September.

In addition, total suspended solids is assessed through the Project's surface water quality monitoring program. The current surface water quality baseline program, which includes total suspended solids, has been ongoing since April 2015 and includes monthly or quarterly sampling at twelve stations located on Geona Creek, Fault Creek, Finlayson Creek, South Creek, and East Creek. More frequent sampling (i.e., five samples in 30 days) was also conducted at most stations in 2017 through 2019 during May and June (high flow) and February and March (low flow) to assess variability in water quality in freshet and low flow winter conditions, respectively. Sampling in May and June in particular overlaps with the spawning period for Arctic grayling (Scott and Crossman, 1998). The surface water quality monitoring program will continue to include assessment of total suspended solids as described in the EMSRP.

In addition to routine monitoring at established stations, water quality, including turbidity, will be regularly measured downstream of any construction in or near water during the Construction Phase and upstream of construction to monitor for potential impacts to fish habitat, as discussed in the Sediment and Erosion Control Plan.

4.6 VEGETATION AND SOIL

IR5-58: Invasive species are not addressed in this plan. Invasive species may become established, particularly within areas disturbed or impacted by mining activities. There is also a proponent commitment to developing an invasive species management plan that should be included in the updated EMSRP and provide clear monitoring and mitigations or controls for invasive species.

BMC Response: Chapter 9 of EMSRP includes monitoring for Invasive Plant Species, and the Invasive Species Management Plan is provided as Appendix E of the EMSRP.

IR5-59: Proponent commitments with respect to development of a chance finds procedure for rare plants have not been fulfilled. The actions and measures identified in those commitments must be included in the updated EMSRP.

BMC Response: BMC acknowledges that a chance finds procedure was not included in the EMSRAMP. A rare plant chance find procedure was included in Section 18.8.2 of the Project Proposal for YESAB Executive Committee Screening (BMC, 2017) and this procedure has been incorporated into Chapter 9 of the EMSRP. The procedure has been modified based on updated rare plant lists and to meet current guidelines for the Project commitments made by BMC for the Project.

IR5-60: Describe what monitoring measures are in place related to hydrocarbons (e.g., visual inspections, seep survey, water samples) near the Landfill Treatment Facility.

BMC Response: Monitoring measures related to hydrocarbons near the Land Treatment Facility (LTF) have been added to Chapter 11 of the EMSRP. The LTF will be visually inspected on a weekly basis to monitor for signs of wildlife, surface run-off, seeps, presence of standing water, structural damage, safety signage, appropriate labelling/signage and proper storage of contaminated material piles. Soil testing and testing of the water in the LTF sump will occur on a quarterly basis at a minimum, including testing for the presence of hydrocarbons. All sampling will be performed in accordance with applicable regulations. A land treatment facility permit from YG is required to build and operate the LTF. Monitoring, sampling and reporting of the LTF will be conducted in accordance with the requirements of that permit.

IR5-61: Monitoring of ecosystem plots and change through time, and characterization of vegetation communities and ecosystems must be conducted in accordance with the Field Manual for Describing Yukon Ecosystems when characterizing vegetation communities or ecosystems.

BMC Response: BMC acknowledges that baseline ecosystem data was collected using the *BC Field Manual for Describing Terrestrial Ecosystems* (BC Ministry of Forests and Range and BC Ministry of Environment, 2010), rather than the *Field Manual for Describing Yukon Ecosystems* (Yukon, 2017). All

future field data collection will follow the *Field Manual for Describing Yukon Ecosystems* when establishing or monitoring ecosystem plots and revegetation trial plots. Chapter 9 of the EMSRP has been updated to specify that ecological community surveys will be conducted in accordance with the *Field Manual for Describing Yukon Ecosystems*.

IR5-62: There is currently no detailed commitment to monitoring vegetation change at control or impacted sites. Include monitoring and surveillance measures to monitor vegetation change at permanent sample plots, both at control sites, and within the zone of influence of work in the updated EMSRP.

BMC Response: See response to IR5-64.

IR5-63: The plan references trying to sample all vegetation types, with little detail on how this could be accomplished, to allow for more informative comparison of control sites against impacted sites in the same ecosite, the EMSRP should be updated to focus sampling on ecosystem mapping information, based on ecosite's present. This would provide a metric for ensuring that sampling of all major ecosites is completed.

BMC Response: See response to IR5-64.

IR5-64: The updated EMSRP should utilize ecosite classification to guide sampling and permanent plot establishment to determine and compare impacted and control sites.

BMC Response: BMC has interpreted that IR5-62, IR5-63 and IR5-64 relate to the soil and vegetation trace metal monitoring program.

Chapter 9 of the EMSRP has been updated to include a clear plan to effectively monitor metal uptake of constituents of potential interest in soil and vegetation. This monitoring program considers existing baseline data, dust dispersion in the region, and the effect being quantified. The updated EMSRP presents a full study design with the number and location of sample sites that will consider the results of power analysis, vegetation communities and logistical restraints.

IR5-65: The updated EMSRP must include additional information with respect to monitoring in wetlands including vegetation communities and vegetation and soil contaminants.

BMC Response: See response to IR5-66 with respect to monitoring soils and vegetation. Monitoring of wetlands has been included in Chapter 12 of the EMSRP.

IR5-66: Permanent wetland monitoring sites in ecosites appropriate for comparison with constructed wetlands should be established in areas where there is no planned disturbance and included in the wetland monitoring program.

BMC Response: The constructed wetlands are proposed to be constructed as part of the Project's Reclamation and Closure Plan. A Wetland Monitoring Program that includes reference sites will commence with the installation of constructed wetlands during Project closure, as detailed in the Reclamation and Closure Plan. A study design will be developed to monitor the efficacy of the

constructed wetlands at treating water and ensuring that metals are not accumulating to any significant degree in the vegetation and soil.

4.7 MINE INFRASTRUCTURE

IR5-67: Provide a list of all geotechnical instrumentation on site (e.g., ground temperature cables, piezometers, inclinometers, etc.) including a plan showing their locations relative to the mine waste and overburden facilities.

BMC Response: A list of all geotechnical instrumentation currently on site and plans showing their locations relative to mine facilities has been compiled and is provided as Appendix N of the Site Characterization Plan. This information was not included in the EMSRP, as most geotechnical instrumentation currently on site is located in the footprint of future mine facilities and infrastructure, so will be destroyed during construction, or are not appropriate for monitoring of Project construction and operation. Chapter 11 of the EMSRP describes the geotechnical and other instrumentation that will be used for monitoring of infrastructure during Project construction and operation.

IR5-68: YG's WL Intervention information request 74 and 75 with respect to seepage monitoring applies to our review of the EMSRAMP as well. The updated EMSRP must address the comments and observations raised in YG's Intervention.

BMC Response: YG's Intervention Information Requests 74 and 75 were considered in developing the monitoring, surveillance and reporting procedures described in multiple chapters of the EMSRP.

With respect to Intervention Information Request 74, water management infrastructure have been designed to mitigate seepage using composite liners comprising an HDPE geomembrane overlying compacted glacial till. As result, there is very low risk of significant seepage emanating from these structures. Nevertheless, different levels of inspection of water management infrastructure will occur at regular intervals ranging from daily to yearly, as specified in Chapter 11 of the EMSRP, with additional inspection as appropriate following irregular conditions such as storm or seismic events. Groundwater quality monitoring will be carried out at downstream monitoring wells to identify potential seepage of impacted water. Additional monitoring systems are not planned, and would not be typical for water management infrastructure of this nature that includes composite liners. Details of these monitoring programs are provided in Chapter 5, Chapter 6 and Chapter 11 of the ESMRP, and an OMS Manual will be developed prior to Project construction, including additional inspection and reporting requirements.

With respect to Intervention Information Request 75, BMC agrees that it is unlikely that the HDPE geomembrane will be installed without any defects, and that it may develop other minor defects over time. For this reason, the Class A and Class B Storage Facilities are constructed using a composite liner comprising low-permeability compacted glacial till overlain by the HDPE geomembrane. As a result, even in areas of HDPE defects, there is very low risk of significant seepage to groundwater beneath these facilities (Rowe, 2012). Liner leakage calculations were presented in the Tailings Management Plan.

Water on top of the Class A Storage Facility composite liner, and surface runoff from the facility, will be collected in the Class A Storage Facility Collection Pond. In the unlikely case that there is flowing water below the composite liner, it will be collected in the underdrain system and conveyed to lined sumps located downstream of the facility. Water collected in sumps will be tested and will be released to the environment if it meets discharge criteria. If this water does not meet discharge quality requirements it will be pumped to the Class A Collection Pond. This system will effectively act as a system to indicate whether there is seepage occurring through the composite liner, as discussed further in Chapter 5 of the EMSRP.

IR5-69: Mine infrastructure monitoring needs to be clearly laid out with schedules for each monitoring method including who is responsible for the data collection and how data will be analyzed. A clear monitoring schedule will ensure emergency response and adaptive management measures can be implemented appropriately.

BMC Response: An overview of mine infrastructure monitoring is included in Chapter 11 of the EMSRP, including indicative schedules and discussion of data collection and analysis.

Monitoring of mine infrastructure, including tailings and waste rock storage facilities and water ponds, is typically a dynamic, complex and multidisciplinary task involving multiple stakeholders, analyses and reviews. An initial detailed monitoring plan is typically developed during Detailed Design as part of a formal mine waste governance program, and summarized in an OMS Manual, including trigger action response plans (TARPs), an Emergency Preparedness Plan and other components, as detailed in MAC (2021b) and Global Tailings Review (2020). The monitoring program is updated regularly in collaboration with the owner's team, the Engineer of Record, Independent Technical Reviewers and other stakeholders. OMS Manuals for the Project, including detailed monitoring procedures, will be developed prior to construction.

IR5-70: A monitoring program for the open pit must be included, the monitoring program must include, but is not limited to:

- a. Slope monitoring and surveying;
- b. tension crack mapping and monitoring;
- c. groundwater monitoring in adjacent to final pit walls; and
- d. emergency response measures.

BMC Response: An overview of open pit slope monitoring is included in Chapter 11 of the EMSRP, and emergency response measures for the Project are discussed in the Emergency Response and Health and Safety Plan.

As with monitoring mine infrastructure (IR5-69), monitoring pit slopes is typically a dynamic, complex and multidisciplinary task that changes as pit slopes evolve and more data are collected on pit slope geotechnics and hydrogeology. General monitoring procedures are typically developed as

part of Detailed Design of the mine and summarized in a GCMP, as detailed in Read and Stacey (2009) and many other common guidelines. Detailed pit slope monitoring activities will be developed by the Mine Engineering team as part of the operational mine planning process, following the general procedures in the GCMP. A GCMP for the Project will be developed prior to the commencement of mining.

IR5-71: Updated the EMSRP to include a monitoring plan for all mine waste management facilities. This plan must include potential run out zones with respect to roads and infrastructure adjacent to the facilities and include these as potential failure outcomes.

BMC Response: As discussed in response to IR5-69, an overview of mine infrastructure monitoring programs is included in Chapter 11 of the EMSRP. All mine waste management facilities at the Project will be constructed using coarse, freely-draining waste rock and/or compacted filtered tailings, and are not susceptible to flow-type failures that could result in a significant runout zone. Failure modes for these types of materials typically result in deformations ranging from centimeters to meters.

IR5-72: Section 11.2 does not reference the requirement for operation, maintenance and surveillance (OMS) manuals for mine workings. OMS manuals are required for all mine waste management facilities as well as mine workings. The manuals will be required for review and approval under the QML.

BMC Response: Chapter 11 of the EMSRP includes reference to the requirement for OMS Manuals for all mine water and waste management facilities, and a GCMP for the Open Pit. As discussed in BMC's response to IR5-41 and other IRs, OMS Manuals and a GCMP will be developed in accordance with MAC (2019, 2021b) and other applicable guidelines, and will be provided to EMR prior to construction of the facilities.

4.8 ADAPTIVE MANAGEMENT PLAN

IR5-73: Prepare and submit a standalone Adaptive Management Plan for the construction and operation periods of the project that reflects the comments throughout this information request, previous information requests issued by Mineral Resources Branch and YG's WL Intervention.

BMC Response: A standalone AMP has been developed.

IR5-74: Adaptive management triggers and actions with respect to observed trends are ambiguous and unclear throughout the plan. In an updated Adaptive Management Plan provide clarity on how trends are identified, the timeframes that are considered when determining a trend is being observed, the number of triggers that are required to determine a measure is a trend versus an anomaly, and the magnitude of change that must be observed to trigger an action.

BMC Response: The Adaptive Management Plan includes more detail of triggers and actions, in accordance with the guidance provided in Yukon (2021a).

IR5-75: Adaptive management strategies within the AMP must align with terminology and processes as defined in the guidelines for developing adaptive management plans in Yukon: Water-related components of quartz mining projects.

BMC Response: The AMP uses the terminology and processes as defined in Yukon (2021a).

IR5-76: The OMS manuals referenced in IR5-72 must include measured triggers to indicate implementation of emergency response measures or other adaptive management measures (e.g., trigger action response plan - MAC 2019 and 2021). The response actions must be clearly articulated and linked to AMP.

BMC Response: OMS Manuals for mine water and waste management facilities, and a GCMP for the Open Pit will be developed in accordance with MAC (2021a) and other applicable guidelines, and will include TARPs clearly articulated and linked to the AMP.

IR5-77: YG's WL Intervention recommendations 30 and 31 with respect to adaptive management triggers and responses to pond levels applies to our review of the AMP as well. The updated AMP must address the comments and observations raised in YG's Intervention.

BMC Response: The AMP includes an AMI related to Water Management Pond levels that was developed considering YG's Intervention Recommendations 30 and 31. This AMI includes only the Water Management Ponds (UWMP and LWMP). It does not include collection ponds as they are either operated with a small maximum operating pond volume and intended to be maintained nearly empty at all times, or they are operated as sedimentation ponds that discharge by overflow. These collection ponds would not discharge impacted water to the environment in the unlikely case that their storage capacity is exceeded.

IR5-78: YG's WL Intervention information request 78 with respect to dewatering of the open pit and underground workings applies to our review of the AMP as well. The updated AMP must address the comments and observations raised in YG's Intervention.

BMC Response: The AMP includes an AMI related to mine dewatering that was developed considering YG's Intervention Recommendation 78.

IR5-79: No adaptive management measures have been proposed for geochemistry. The AMP must include comment on actions that would be taken in the event that waste rock classification, segregation and management methodologies do not meet the objectives or are insufficient meet objectives in the Tailings and Waste Rock Management Plans.

The AMP must consider both neutral metal leaching conditions and acid rock drainage conditions. Changes to monitoring frequencies, increasing laboratory and analytical confirmations and decreasing visual examinations may be necessary actions throughout the mine life.

BMC Response: The AMP includes an AMI related to tailings, waste rock and overburden geochemistry, including both neutral metal leaching and acid rock drainage conditions.

IR5-80: Update the AMP to include additional fish and fish habitat metrics (i.e. specific population abundance (CPUE) changes) to enact an increasing scale of mitigative measures. This should be detailed further than 'acute or chronic effects'. Detailing such specific metrics and thresholds will allow for accurate effects monitoring and mitigation.

BMC Response: The AMP includes a detailed AMI for Fish and Aquatic Resources, including identifying suitable indicators and establishing triggers and action levels with corresponding management actions or responses that correspond to the action level severity. Linkages with the Surface Water Quality AMI have also been considered in the updated Fish and Aquatic Resources AMI. Of note is that the number of arctic grayling that have been captured upstream of the Robert Campbell Highway crossing through baseline and compliance monitoring studies since 1995 has been low. For example, only 113 arctic grayling have been captured in Geona Creek in baseline studies conducted in 1995 and from 2015 to 2017 (Cominco, 1996; AEG, 2016; BMC, 2021). During WL compliance monitoring in August from 2000 to 2014 and October in 2016 in Finlayson Creek, only one arctic grayling was captured at stations KZ-15 (100 m downstream of the confluence with Geona Creek) and KZ-16 (upstream of the confluence with Geona Creek) over the eight monitoring events (Cominco, 2000; Laberge and Can-Nic-A-Nick, 2003 to 2017). Slimy sculpin (*Cottus cognatus*) have been caught more frequently in Finlayson Creek, but have not been caught in Geona Creek except at the confluence with Finlayson Creek. While the planned baseline field program in 2024 will provide greater spatial coverage to determine the distribution and abundance of fish in Geona and Finlayson Creek, it is possible that densities of fish upstream of the Robert Campbell Highway crossing are too low (arctic grayling in Geona and Finlayson Creek) or too low in some areas (slimy sculpin in Geona Creek) to reliably catch enough fish to gain statistical certainty regarding potential negative effects based on metrics of fish health (e.g., condition) or abundance. For this reason, indicators representing fish habitat attributes and benthic invertebrate community have been used for the Fish and Aquatic Resources AMI to provide greater certainty regarding potential effects on fish.

IR5-81: Specific responses for vegetation and soil focus solely on dust abatement which may not be sufficient to address increased metals loading as metal contaminants may also get to soils and vegetation through groundwater movements. Update the AMP to include determination of source pathways for the metal contaminants with specific action to address that pathway.

BMC Response: The AMI for metals content in soils and vegetation incorporates actions targeting potential pathways for metal contaminants beyond dust abatement. The trace metal monitoring program initially focuses on activities that could increase trace metal concentrations in soils and vegetation, particularly those related to airborne particle dispersion such as dust and emissions.

While the primary focus remains on airborne particles, a possible secondary dispersion pathway would be an increase in trace metal concentrations in groundwater. Soil sampling is conducted within the top 30 cm of the mineral soil profile, above the water table. The water in this zone would be from the surface (i.e., rainfall, snow melt, surface runoff) and not groundwater. Although some plant roots may access groundwater, the selected plant species mainly rely on moisture found above the water table within the soil.

As part of the trace metal monitoring program, rigorous analysis will be used to confirm the source of any increase in trace metal concentrations beyond baseline levels. If it is determined that the increase is not attributable to airborne particles, further investigation into potential sources such as groundwater will be undertaken.

IR5-82: Decision Document term and condition 33 required BMC to include adaptive management measures to address potential leakage from the Class A storage facility. The updated AMP must outline monitoring, triggers and actions associated with the Class A storage facility that address leakage scenarios.

BMC Response: The AMP includes an AMI related to potential leakage through the Class A Storage Facility's composite liner.

IR5-83: Decision Document term and condition 36 required BMC to develop and implement adaptive management measures with respect to monitoring for the onset of acidic conditions, that allowed for early detection, management, and mitigation of acidic conditions and metal leaching developing on site. The updated AMP must include this information.

BMC Response: The AMP includes an AMI related to tailings, waste rock and overburden geochemistry, including the potential onset of acidic conditions.

IR5-84: Decision Document term and condition 37 required BMC to develop an ambient air monitoring and adaptive management plan for all Criteria Air Contaminants (CACs), based on updated (2025) standards. The updated AMP must include this information.

BMC Response: The AMP includes an AMI related to air quality based on updated standards.

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