MEMORANDUM

To: Kamloops Fly Fishers' Association **Date:** March 31, 2017

From: KGHM Ajax Mining Inc.

CC: B.C. Environmental Assessment Office, Canadian Environmental Assessment Agency

Subject: Response to Ajax Project Application/EIS Public Comment Period Submissions

To the members of the Kamloops Fly Fishers' Association:

Thank you for your comments provided on the Ajax Project Environmental Application/ Environmental Impact Statement (Application/EIS). This memo provides information as to how the concerns raised in your submittal are being addressed.

1. INTRODUCTION

As part of the environmental assessment review process for the Ajax Project (the Project), the BC Environmental Assessment Office and the Canadian Environmental Assessment Agency held a 75-day public comment period from January 26 to April 11, 2016. The following submissions were received from the Kamloops Fly Fishers' Association (KFFA):

- Letter dated February 26, 2016 re: Road closure of Goose Lake by Applicant KGHM Ajax;
- Letter dated March 15, 2016 re: Comment Period Submission

KGHM Ajax Mining Inc. (KAM) appreciates the level of effort the KFFA has put into review of the Project, and is pleased to provide the following response, which outlines our understanding of KFF's key issues, and summarizes how we are addressing these topics. As KFFA has also been engaged in earlier stages of the environmental assessment directly with KAM and also through the Ajax Community Advisory Group, KAM would like to take this opportunity to directly respond to your submission. KAM's direct response to your submission is consistent with commitments made in the Community Consultation Plan (Appendix 4.7-A of the Application/EIS) and guidance provided by the EAO. Through our consultation efforts, KAM intends to build long-lasting and productive relationships with Kamloops residents and key stakeholders to ultimately reach mutually beneficial levels of understanding of everyone's needs and aspirations.

2. KEY ISSUES

Reviewing the KFFA submission, KAM has identified the following key issues:

- Effects of blasting on fish and fishing
- Effects of the Project on fish and fishing (separate from blasting)
- Suitability of fish habitat and fishery offsetting at Inks Lake
- Effects of the Project on Access/Traffic
- Visual effects of the Project from Jacko Lake

Consistent with the direction provided by the EAO, we have taken the time to review all of the 3,845 public submissions received, has analyzed and sorted them into 177 issues (see attached Document Map), and then developed responses to these issues. These responses will be posted on the EAO ePIC website, and will be publically available for review.

KAM reviewed your letter and considered where your comments were raised by other parties in the public comment period and where the issues in your letter may have been unique. Topics raised in the KFFA submittals that were shared by the general public can be found within the response to public comments (see Section 5 Useful Links). Topics raised in the KFFA submission which were not covered within the response to public comments, or warranted additional analyses or discussion are addressed in Section 3 of this letter.

KAM has been concurrently reviewing comments from the technical working group, Aboriginal groups and the public with regard to fisheries issues. We have provided a substantial set of supplementary material to EAO and the Agency in response to comments received by technical reviewers on behalf of the City, First Nations, provincial and federal agencies, and other Working Group members. Within those supplemental documents, there are a number of key updates to Project design, and new commitments to mitigation that we have made in response to the comments received. We would like to ensure that you are also aware of those changes. Some of the key areas include:

- Project Design:
  - Updated Peterson Creek Diversion System;
  - Updated Fish Habitat and Fishery Offsetting Plan;
- Mitigation Measures and Commitments:
  - Fugitive Dust Management Plan;
  - Peterson Creek streamflow;
  - Updated Wildlife Management and Monitoring Plan;
  - Grassland restoration and enhancement (>2,000 ha on Sugarloaf Ranch);
  - Ephemeral wetlands included in compensation calculation;
- Additional Analysis and Assessment:
  - Air quality modelling;

- Groundwater, water balance, and water quality modelling;
- Cumulative effects of water quality in Lower Peterson Creek;
- Critical habitat for *Species at Risk Act* (SARA) listed and other wildlife species;

Recognizing that these supplemental submissions add to what is already a large volume of material; KAM has also developed a few tools to support technical reviewers, including a directory of supplemental memos, and a set of integrated summary memos, which summarize, from KAM's perspective, the key supplemental responses and their implications for the review process. While these tools were developed for technical reviewers, we anticipate that they may also help facilitate your review, and as such refer to Section 5 Useful Links, below.

Responses to the specific concerns raised by KFFA can be found in the following responses using the above noted links:

- KFFA Concerns #1 and 8: Public Response Report – Environment Pillar Section 4.4.3 Downstream Water Quality
- KFFA Concern #2: Public Response Report – Social Pillar Section 6.6.2 Effects on fishing activities
- KFFA Concerns #2, 3, 4, 5 and 6: Public Response Report – Environment Pillar Section 4.5.3 Effects of blasting on fish
- KFFA Concerns #2, 3, 4, 5, 6 and 13: Public Response Report – Environment Pillar Section 4.5.1 Effects on fish/fish habitat
- KFFA Concern #9: Public Response Report – Environment Pillar Section 4.5.4 Inks Lake (incl. fish stocking)
- KFFA Concern #14: Public Response Report – Environment Pillar Section 4.4.1 Adverse effects to water quality
- KFFA concern regarding closure of a section of Goose Lake Road: Public Response Report – Social Pillar Section 6.6.3 Closure of Goose Lake Road

KFFA concerns not addressed via the above list of responses to public comments are addressed below.

3. RESPONSE

As mentioned above, topics raised in the KFFA submission that were not covered within the general public response memos or that warranted additional analysis were identified and are discussed further below.

In addition, in response to comments from technical reviewers, KAM has provided the following supplemental submissions to EAO/CEAA that we believe will also be interest and relevance to KFFA's concerns:

- 0706_KAM_Peterson Creek Water Temperature Effects

- 0706_KAM_Fish Habitat and Fishery Offsetting Plan
- 0706_KAM_Peterson Creek Instream Flow Requirements
- 0706_KAM_Instream Works
- 0706_KAM_Fish Offsetting Engagement
- 1219_KAM_EAO Request Maximum Noise Assessment Results

3.1 Effects of Blasting on Fish and Fishing

Your letter includes concerns related to dispersion of dust and other blasting by-products into fish bearing water bodies, blasting vibration effects on fish, blasting during ice cover conditions on the lake, the frequency and timing of blasting events, lake access restrictions related to blasting, and how KAM will communicate blasting zone restrictions to anglers.

Blast designs for the Project have been developed by a blasting expert to protect the health and safety of the public, mine employees and aquatic life in Jacko Lake. The blast designs include procedures for blast notifications, warning signage, blast clearance zones, communications, and post-blast inspections. The effects of blasting near fish-bearing waters and mitigation measures are described in Section 6.7.4.2 of the Application/EIS starting on page 6-49 Information on blasting procedures, including dust control, is contained in Appendix D of Appendix 10.5-A.

KAM acknowledges there could be behavioural changes of rainbow trout that congregate on the east Shore of Jacko Lake and closest to the open pit during construction and during blasting. However it is not possible to predict the number of fish that may be present near the eastern shore of Jacko Lake prior to blasting events and pile driving or if any negative effects will occur. Additional details of measures that will be implemented during dam construction have been provided in the supplemental memo *0706_KAM_Instream Works*.

Importantly, in response to comments received from working group members including the Ministry of Forest Lands and Natural Resource Operations, KAM has committed to not blast between the hours of 10:00 AM and 2:00 PM during the fishing season and when blasting operations require access restrictions on the east side of Jacko Lake to reduce impacts to prime fishing hours related to chironomid hatch timing. KAM has committed to not blasting during this time to minimize effects on the recreational fishery. This commitment is conditional and effective only:

- from April 1 to October 31 (when Jacko Lake is open for fishing), and
- when the blast clearance radius extends into Jacko Lake requiring clearing of the lake.

The blast clearance area is defined as a 500 m radius from blast patterns in the open pit. Due to the proximity of the Open Pit to Jacko Lake, the blast clearance area will extent into the lake when blasting occurs within 500 m of the lake. Therefore blasting that occurs beyond 500 m from the lake will not require temporary clearance and access restrictions. The limits of the blast clearance area will be reviewed once blasting activities begin to move away from the western most side of the open pit (approximately year 5 of operations) and will be removed entirely once the 500 m clearance area no

longer reaches the lake. It is also important to note that access restrictions within the blast clearance area will be short term and temporary – access will only be restricted on days which blasting will occur within 500 m of the lake and will last approximately 1-2 hours for most blasting events. Signs will be erected at the Jacko Lake roadway access point and boat launch with daily updates advising of blasting dates and times. KAM will communicate the blasting dates and times to the public through the Ajax website and/or the local radio stations and newspapers as warranted. KAM will also seek to communicate blasting dates and times to local fishing supply stores as a conduit to out of town fishers. A detailed blast clearance procedure will be developed as part of the *Mines Act* permit application to detail the process for clearing the blast clearance area. The procedure will include responsibilities of KAM personnel, public notification methods, clearing procedures for all areas within the blasting safety radius, blast firing procedures, methods to communicate post blast return to the clearance area and, monitoring of potential adverse blasting related effects.

KAM has proposed a monitoring program to detect and address effects of pile driving and blasting in Jacko Lake. Pile driving and blasting activities can be readily modified if monitoring results show any effects beyond what has been predicted.

With respect to blasting during ice-on conditions, it is not economically feasible to blast "away from" Jacko Lake during ice-off to minimize disturbance to anglers. The Ajax specific blast designs as described in the Application/EIS are expected to be sufficient during ice-on or open water conditions. If monitoring indicates otherwise during ice-on, KAM will take additional actions to protect fish including changes to the blast designs.

Regarding your concerns related to water contamination from nitrogen blast residuals, dust fall, seepage and erosion/sedimentation impacting fish in surrounding waterbodies, KAM has incorporated design features and mitigation measures to prevent water quality degradation in Jacko Lake and downstream of the Project. We have committed to collecting all contact water (water that has come into contact with mine facilities), and will reuse this water in the mineral processing circuit. Details of how water will be managed on site are discussed in Section 11.7 Water Management and Hydrometric Monitoring Plan of the Application/EIS. Water quality changes are predicted to remain within acceptable levels with the mitigations proposed in the Application/EIS and the predicted changes in water quality in the area of the Project are expected to remain safe for people and the environment. Water quality monitoring frequency will be determined with input from the Ministry of Environment during the permitting phase of the Project; however KAM has initially proposed monthly water quality sampling in Jacko Lake and Peterson Creek. The aquatic effects monitoring program for adaptive management will meet BC Environmental Management Act (EMA) Effluent Permit discharge requirements even though the Project is not expected to have a direct discharge to the surface water receiving environment. The monitoring schedule for each environmental indicator (i.e., water quality, fish population, benthic invertebrate community, and fish tissue) will aim to be consistent with the required sampling frequencies outlined in the Metal Mines Effluent Regulation (to be used as a guideline as no discharge authorization will be required under the MMER) and the EMA Permit, by following the guidance provided in the Metal Mining Technical Guidance for Environmental Effects Monitoring (Environment Canada 2012b), the Water and Air Baseline

Monitoring Guidance Document for Mine Proponents (BC MOE 2012), the Fish Collection Methods and Standards (BC 1997), and the British Columbia Field Sampling Manual (Clark 2003).

3.2 Effects of the Project on fishing

KAM recognizes concerns raised by the KFFA related to potential impacts to the recreational fisheries in the Project area, notably Jacko Lake. The Project will result in unavoidable impacts to the lake which will cause impacts to the recreational stocked trout fishery. KAM has made efforts, as required by the federal *Fisheries Act*, to develop a Fish and Fishery Offsetting plan to counterbalance these impacts. Key aspects of the proposed offsetting plan include:

- Updates to the design of the Peterson Creek Diversion System will avoid potential changes to circulation in Jacko Lake, and will therefore continue to support existing habitat in the southeast arm of Jacko Lake
- The majority of offsetting works in and around Jacko Lake with a focus on improvements to the recreational and Aboriginal fisheries:
  - Expansion of the west arm of Jacko Lake to increase fish habitat and recreational fishing areas
  - Improved access to Jacko Lake via a new road
  - A new boat launch, day use area and shoreline trails for fisherman on private land
  - restoration of upper Peterson Creek immediately upstream of Jacko Lake to restore an asserted trout Aboriginal fishery
  - a new dam and spillway on Jacko Lake that will improve Aboriginal fishing in the reach of Peterson Creek immediately downstream of Jacko Lake

KAM acknowledges that while there will be unavoidable impacts to the northeast arm of Jacko Lake and that the fishing experience will change due to mining operations, KAM is confident that these offsetting works will result in net gains of productive fish habitat and overall fishing experience. While it is not possible from an operational perspective to restrict mining in the west side of the open pit to the winter months to avoid the fishing season, KAM has strived to minimalize the deterioration of the fishing experience at Jacko Lake, and has included improvements to the boat launch area as part of the Project design. As described above, KAM will communicate restricted access dates and times through signage at the access gate as well as on the KAM website.

As you note in your letter, KAM's predictive noise modelling shows noise levels may exceed the annoyance threshold at the east end of Jacko Lake during piling, which is expected to last for two months. During the operations phase of the Project it is predicted that maximum noise levels will not exceed 67 dBA at the eastern end of Jacko Lake (closest to the mine site). This predicted sound level is equivalent to a typical conversation at 1 meter distance but less than a typical household vacuum cleaner. Maximum predicted sound levels were modeled and results are provided in supplemental memo entitled 1219_KAM_EAO Request_Maximum_Noise_Assessment_Results. The modelling predicts cumulative noise of steady state noise sources (e.g. crushers, process plant, etc.) and transient noise sources such as trucks and mine site traffic. This produces a conservative estimate prior to

consideration of mitigation measures. There are a number of mitigation measures available to reduce noise that KAM will apply in the event noise exceeds the levels predicted as part of the modelling work completed to date.

Regardless of these predictions and mitigation measures, KAM acknowledges that annoyance thresholds are subjective and vary amongst individuals and we understand that the fishing experience on Jacko Lake will change during the life of the Project; however noise levels will be similar to that experienced during prior mining operations. Changes to fishing experience will be limited to the visual landscape east and south of the lake and to increased noise levels that are predicted to be below accepted annoyance thresholds.

Regarding your recommendation to line the access road with trees to combat noise and dust, KAM has considered planting the Ajax Mine Access Road adjacent to Jacko Lake with trees to mitigate dust and noise impacts on anglers fishing on Jacko Lake during operations. However we've not completed detailed engineering for the Project and will seek to incorporate trees to screen dust and noise along the road provided there are no safety concerns for sight lines etc. We are confident the proposed dust mitigation measures will be adequate and that noise levels will be low enough to not impact recreational users of the lake significantly. However we appreciate the suggestion and will consider it if monitoring indicates the need for additional measures.

Finally regarding your concerns on the effects of the Peterson Creek Diversion System that proposed to pump water from Jacko Lake via an intake in the lake rather than discharge through the southeast arm (outlet bay), KAM has made a major change to the proposed diversion design. The updated design no longer includes an intake, pumphouse, diversion pipeline north of the Open Pit or the Peterson Creek Downstream Pond. The updated design includes a gravity fed buried culvert approximately 2.7 km downstream of Jacko Lake to protect water quality during mine operations. The culvert intake will be approximately 200 meters downstream of the proposed replacement dam on Jacko Lake leaving a section of Peterson Creek open. The culvert outlet will be 2.7 km downstream and discharge directly to Peterson Creek east of the mine site. The Peterson Creek Downstream Pond (PCDP) is no longer part of the Project design which results in reduced impacts of this previously planned facility. Perhaps most important to habitat and fishing areas in Jacko Lake, this new diversion design will allow for the Jacko Lake outflow to Peterson Creek to operate in a similar fashion as it does today, and will not result in impacts to water circulation or invertebrate productivity in the southeast arm.

3.3 Suitability of Proposed Offsetting at Inks Lake

We appreciate your comments on the suitability of the proposed Inks Lake Fish Offsetting Plan and have received similar comments through the government's technical review. In response to these comments we have decided not to pursue the Inks Lake plan and instead developed an alternate offsetting proposal. Detailed of the revised plan can be found in *0706_KAM_Fish Habitat and Fishery Offsetting Plan*, and are discussed further below.

3.4 Effects of the Project on Access / Traffic

We appreciate your concern for increased traffic in the area especially during the construction period, and how this could affect safety, dust and noise. The effects of the Project on traffic were studied in the Ajax Mine Traffic Impact Assessment (Appendix 8.1-A). Project traffic will be limited to two discrete access routes, one during construction and the other for operations once a new highway interchange is constructed. The routes are direct from the Coquihalla highway via the existing Ajax Mine Access Road.

We have also proposed a change in access to Jacko Lake from Lac Le Jeune Road. The Ajax Mine Access Road (AMAR) is currently a private road that connects an existing decommissioned open pit formerly operated by the Afton Operation Corporation with the New Afton Mine site on the west side of Highway 5. The AMAR is a compacted gravel road originally designed for mine haul truck traffic to transport ore from the Historic Ajax East and West Pits to the mill at the Historic Afton Mine. A multi-plate culvert allows the AMAR to pass over Lac Le Jeune Road, maintaining separation of site related traffic from Lac Le Jeune Road traffic. The multi-plate culvert overpass was constructed in 1988 and is owned and maintained by KAM.

The current road configuration presents a safety concern for public traffic on Lac Le Jeune Road as well as site related traffic. The combination of proximity of the Lac Le Jeune Road / Inks Lake Road intersection to the AMAR overpass, limited sight lines, and the predominant behaviour of drivers to exceed the speed limit in the area creates safety concerns. A traffic engineer has recommended that the intersection configuration be improved for existing traffic on Lac Le Jeune Road and site related traffic for current operations. To improve the safety of the intersection of Lac Le Jeune Road and the Jacko Lake road, KAM has proposed upgrades to the AMAR road crossing and connection of the AMAR to Lac Le Jeune Road so that public traffic may access Jacko Lake directly from Lac Le Jeune Road or the Coquihalla Highway. The proposed works include construction of a new link road from AMAR to Lac Le Jeune Road and construction of a new link road between Lac Le Jeune Road and Jacko Lake Road via the AMAR. This link will allow traffic from Lac Le Jeune Road to access Jacko Lake via a safer connection with improved sight lines. This concept will include shared use of the AMAR by the public and Project traffic for approximately 250 m between the connector roads from Lac Le Jeune Road and Jacko Lake Road.

The existing Lac Le Jeune Road /Inks Lake Road intersection and road segment will not be required after construction of the new link roads described above. Figures showing the existing roads and a conceptual plan for the upgraded roads are provided below.

In addition to these changes to the Lac Le Jeune Road / Inks Lake Road Intersection with the AMAR, we have proposed a new Jacko Lake access road from the AMAR to the boat launch. Two options have been proposed for consideration and we would appreciate your feedback as to which may be preferred. The options are shown by the figure below and described in the revised Fish Habitat and Fishery Offsetting Plan.

Figure 2. Photo of Existing Road Network at LLJR and AMAR Intersection

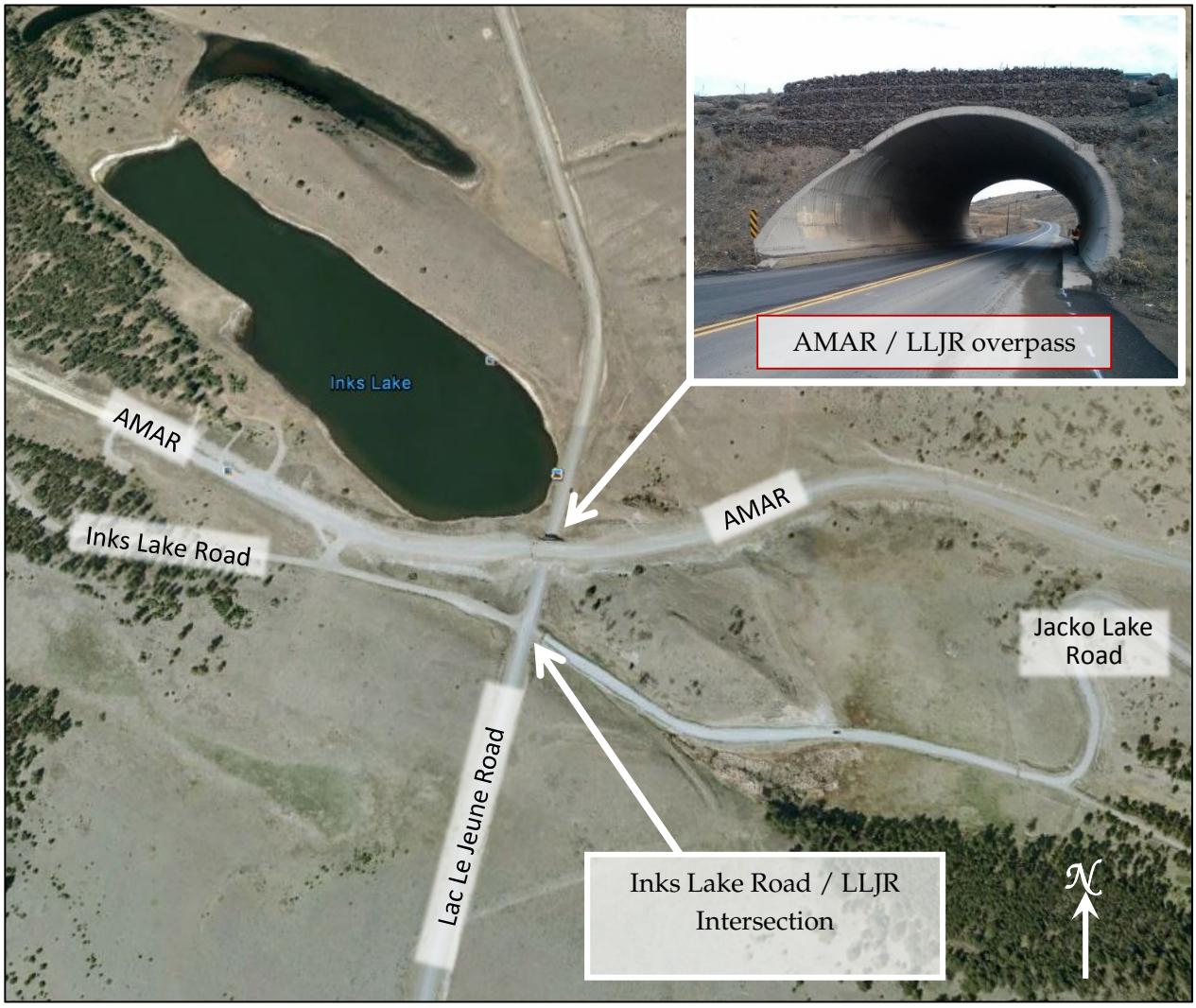


Figure 3. Conceptual Layout for LLJR and AMAR Intersection

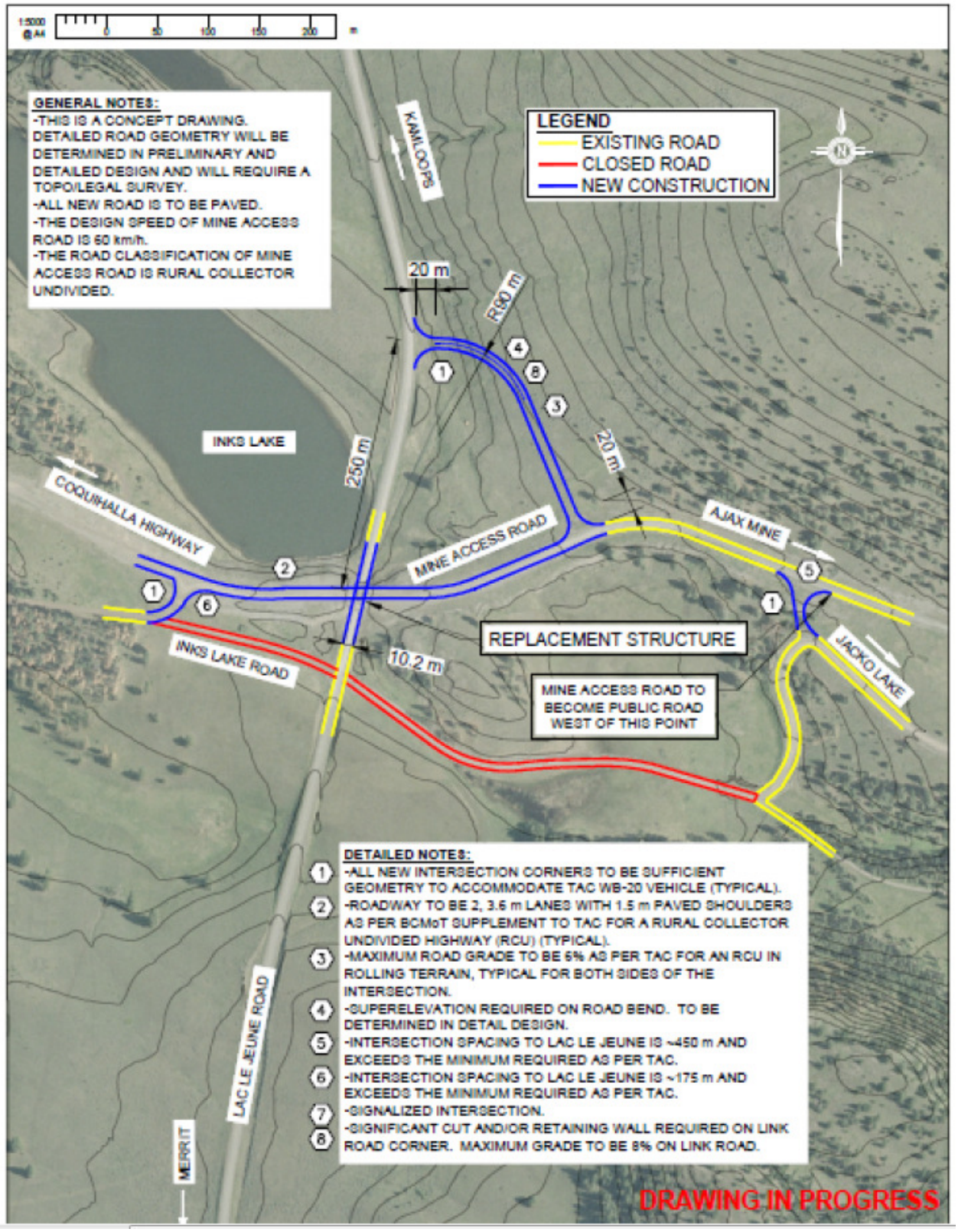
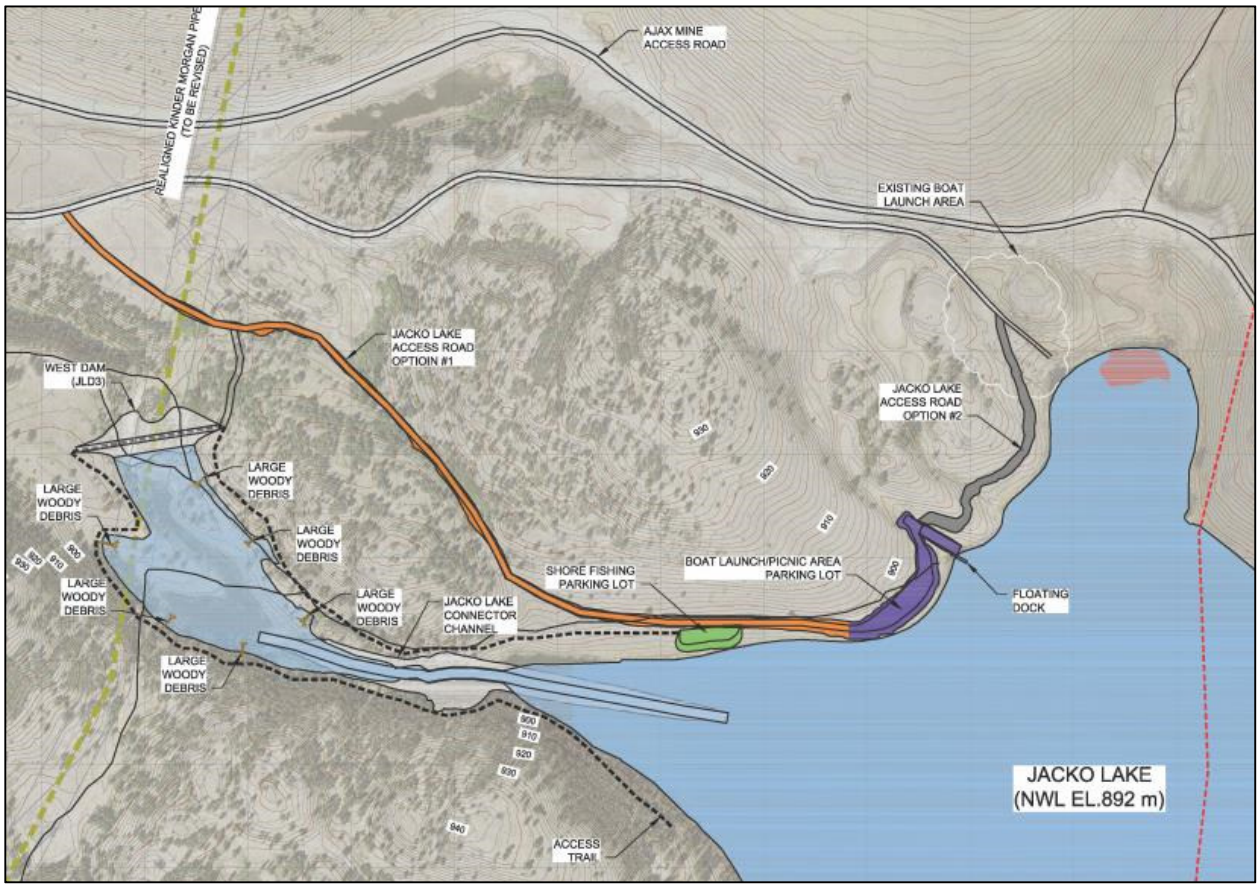


Figure 4. Jacko Lake Access Options



3.5 Effects of the Project on Fish via Changes to Water Quality and Habitat Loss

This section of the letter is in response to concerns raised regarding effects of the Project on fish via contact water discharge by seepage from mine facilities to Jacko Lake, fugitive dust deposition in Jacko Lake that would result in water quality changes Rainbow trout in Jacko Lake will be protected through Project design, standard mitigation measures and Project specific operational procedures. There will be unavoidable losses of fish habitat in Jacko Lake due to open pit development. However these losses will be offset by the creation of improved habitat on Jacko Lake and Peterson Creek.

The Fish and Fish Habitat Effects Assessment in the Application/EIS (Section 6.7) examines how the Ajax Project could affect fish and fish habitat in the Project area. Potential effects to fish and fish habitat were assessed including the death of fish, habitat loss, indirect habitat loss due to flow reductions and non-lethal impacts that alter the fisheries near the Project.

KAM is confident that direct fish mortality and injury can be prevented through the measures described in Section 6.7 of the Application/EIS.

Fish habitat losses from the proposed Project include impacts to the northeast arm of Jacko Lake (a.k.a. mine bay) and Peterson Creek. Early on in the Project planning process, KAM focused on the protection of Jacko Lake by considering a number of facility configurations and open pit designs.

Due to the spiritual and cultural importance of Jacko Lake to SSN and its importance to the community as a valuable recreational fishery, draining the lake in its entirety was not contemplated contrary to belief held by some members of the public. On the contrary, various mine plans were investigated to preserve the lake and avoid any impacts to the northeast arm which overlies a portion of the copper gold mineralization.

Chapter 17.4 of the Application/EIS provides the assessment of Alternative Means of Carrying out the Project. This chapter describes the approach used to select preferred options from a variety of alternative means of developing the Project. The assessment of alternatives demonstrates the decisions KAM has made to minimize the potential adverse effects from the Project while maximizing beneficial environmental, cultural, and socio-economic effects, and remaining technically and economically feasible. Regarding KFFA concerns related to water contamination from nitrogen blast residuals, dust fall, seepage and erosion/sedimentation impacting fish in surrounding waterbodies, KAM has incorporated design features and mitigation measures to prevent water quality degradation in Jacko Lake and downstream of the Project, including collecting all contact water (water that has come into contact with mine facilities), and reusing this water in the mineral processing circuit. Details of how KAM will manage water on site are discussed in Section 11.7 Water Management and Hydrometric Monitoring Plan of the Application/EIS. Water quality changes are predicted to remain within acceptable levels with the mitigations proposed in the Application/EIS and the predicted changes in water quality in the area of the Project are expected to remain safe for people and the environment.

For Jacko Lake, scientists did not find any cases where changes in surface water quality would exceed protective water quality guidelines and benchmarks.

The amount of dust estimated to be generated from mining activities is presented in detail in Section 10.1 (Air Quality), and Figure 10.1-7 illustrates the maximum predicted 30-day dust fall deposition. Although slight increases in dust fall to Jacko Lake are predicted during mine operations, changes to productivity of the littoral zones in Jacko Lake or to fish health from the incremental dust fall associated with the Project are not expected based on air quality modelling completed for the Application/EIS (Section 10.1).

However, KAM understands the concern for dust generation from the Project, and is committed to minimizing emissions through multiple Project design criteria and mitigation measures. The review of the Application/EIS has sparked many good questions as to how KAM will achieve the commitments it has made for mitigating emissions. In response to these questions and comments, KAM has developed a detailed Fugitive Dust Mitigation Plan. Details of the plan can be found here: 1207_KAM_Fugitive Dust Mitigation Plan.

3.6 Visual Effects of the Project from Jacko Lake

Your letter requests photographs are provided of the view that will exist from the Jacko Lake as a result of the Project. Section 8.3 of the Application/EIS presents the Visual Impacts and Aesthetic Features Assessment which includes the visual simulations from multiple viewpoints including the Jacko Lake boat launch. An existing view is presented along with simulated views during operations and post mine closure from the boat launch on Page 8.3-46 and is included below.

Figure 4. Visual Simulations for Views of Project from Jacko Lake Boat Launch

Plate 8.3-6a. Existing view of the Project site from Viewpoint 35 (Jacko Lake Boat Launch).

Plate 8.3-6b. View of the Project site from Viewpoint 35 (Jacko Lake Boat Launch) during the Operations Phase (Year 15).

Plate 8.3-6c. View of the Project site from Viewpoint 35 (Jacko Lake Boat Launch) during the Post Closure Phase.

4. CONCLUSION

We value your feedback received to date regarding the Project and the conclusions of the environmental assessment. As a result of comments received we have updated the Project design and committed to additional mitigation measures, which together will help to minimize the environmental effects of the Project. We hope that the information provided in this letter, and in the larger public response memos, continues to demonstrate our commitment to being an accountable, transparent, and credible operator of an environmentally responsible mining operation.

We believe that the Project can be developed and implemented in a manner that maintains health and social well-being at the family and community level, and that the Kamloops region will continue to support ecological diversity and economic opportunity.

We appreciate the comments received from the KFFA and look forward to continued collaboration as opportunities or needs arise. Thank you for taking the time to contribute to the Environmental Assessment process and providing input to support our goal for continuous improvement.

5. USEFUL LINKS

The responses provided in this document make reference to a range of other related materials. For ease of reference, links to the following materials are provided. Specific cross-references are also provided in the text.

KGHM Ajax Mining Inc.

http://ajaxmine.ca

EAO e-PIC site for the Ajax Mine Project

https://projects.eao.gov.bc.ca/p/ajax-mine/detail

Ajax Project Application/EIS

https://projects.eao.gov.bc.ca/p/ajax-mine/docs?folder=161

Plain Language Summaries of the Application/EIS

http://application.ajaxmine.ca/Home.aspx

Responses, including supplemental technical memorandum, provided to the Technical Working Group

https://projects.eao.gov.bc.ca/p/ajax-mine/docs?folder=220