

Response to Comments Document
Draft Waste Management Permit No. 2016DB0001 and
Draft Reclamation Plan Approval (F20169958)

This document summarizes and addresses comments received on Alaska Department of Environmental Conservation (DEC), draft Waste Management Permit (WMP) No. 2016DB0002 and Alaska Department of Natural Resources (DNR), draft Reclamation Plan Approval (F20169958). The public comment period for these draft authorizations began on August 11, 2016 and ended on September 12, 2016, and a public notice bulletin was published in the Arctic Sounder on August 11 and 18, 2016. The WMP regulates the containment and disposal of mine tailings, wastewater, and other mine-related wastes at the Red Dog Mine, while the Reclamation Plan Approval regulates activities associated with reclamation and closure of the mine site. Teck Alaska Incorporated (TAK) operates Red Dog Mine located 82 miles north of Kotzebue, Alaska in the foothills of the DeLong Mountains. The State received comments from three parties, the Center for Science in Public Participation (CSP2), TAK, and Mr. Scott Pexton (Pexton).

Permit-specific comments on the DEC draft permit and DNR draft approval and the State's responses to those comments are contained in the table on the following pages

Comment #	Commenter	Comment	Comment Response
1	CSP2	<p>This comment concerns <i>Integrated Waste Management Plan Red Dog Mine, Alaska, USA August 2016 (IWMP) Appendix C – Waste Rock Management Plan August 2016</i>. In section <u>2.6 Qanaiyaq Pit Dump - Planned</u>, it says that since waste from the Qanaiyaq Pit is thought to be above the water table, waste will not be segregated. Why?</p>	<p>The Qanaiyaq Pit is entirely above the water table, and therefore, there is no benefit to segregate waste for purposes of backfilling high risk waste in a pit lake scenario. However, waste will continue to be segregated for purposes of providing construction material, cover, and identifying higher risk material for strategic placement in the dumps. Language will be added to clarify this section.</p>

Comment #	Commenter	Comment	Comment Response
2	CSP2	<p>This comment concerns <i>IWMP Appendix C – Waste Rock Management Plan August 2016</i>. In section <u>4 Waste Rock Classification and Segregation</u>, segregation criteria for characterizing dam construction material may not prevent acid rock drainage or metal leaching (ARD/ML) outside of containment. Additionally, dam stability may be compromised due to decomposition of the construction materials.</p>	<p>Segregation criteria is designed to classify material based on ARD/ML potential. Therefore the potential for ARD/ML to occur in materials used in dam construction is minimized or mitigated. If ARD/ML does occur, drainage would then be confined to designed and monitored containment.</p> <p>Immediately downgradient of the Main Dam are two layers of seepage recovery. First, there is an underdrain collection and pump back system, which is followed by a seepage collection and pump back pond.</p> <p>Since construction of the Main Dam and commencement of mining, there has been no evidence of the dam materials adversely affecting downstream water quality. Further, water quality in the Middle Fork drainage has actually improved post commencement of mining. This improvement is demonstrated by the migration of grayling into the Middle Fork, which was uninhabitable prior to mining due to naturally acidic water with elevated metals. Additionally, water quality data from Red Dog Creek and the presence of abundant vegetation indicate that ARD/ML effects downgradient of the Main Dam have diminished when compared to pre-mining conditions.</p> <p>DNR, Division of Mining, Land and Water, Dam Safety and Construction Unit oversees dam design, construction, and stability. Technical specifications for dam construction materials are determined by the critical performance parameters of the dam.</p> <p>No changes were made based on this comment.</p>

Comment #	Commenter	Comment	Comment Response
3	CSP2	This suggestion concerns <i>IWMP Appendix C – Waste Rock Management Plan August 2016</i> . The comment points to section <u>4 Waste Rock Classification and Segregation</u> and recommends that cover material be used for dam construction.	<p>The Main Dam has been constructed using materials based on the listed segregation criteria. This is a mature facility that has 30 years of monitoring and oversight. To date, there have been and currently are no ARD/ML or stability concerns associated with the dam. At this point, it would be imprudent to change dam construction materials.</p> <p>No changes were made based on this comment.</p>
4	CSP2	This comment concerns <i>IWMP Appendix C – Waste Rock Management Plan August 2016</i> . In section <u>4 Waste Rock Classification and Segregation</u> , the plan states that high sulfur waste rock subject to subaerial disposal will be blended to prevent hot spots. The blending strategy seems complex, but no quality assurance measures are offered. How will this plan be implemented to insure that it is followed?	<p>Two prevalent strategies for subaerial disposal of high sulfur waste rock are encapsulation and blending. The nature of high sulfur waste rock at Red Dog Mine make blending necessary because encapsulation encourages hot spots. The blending strategy is simply designed to avoid hot spots that result from encapsulation. Once the waste is placed for disposal, there are no performance parameters for waste rock dumps other than to avoid hot spots. Experience implementing the blending strategy indicates that it successfully mitigates the development of hot spots. Given the success with which the mine currently implements blending, current practices will continue to be followed, and no in situ testing of the waste rock dumps is necessary.</p> <p>No changes were made based on this comment.</p>
5	CSP2	This comment concerns <i>IWMP Appendix C – Waste Rock Management Plan August 2016</i> . In section <u>4 Waste Rock Classification and Segregation</u> . In Appendix A: Segregation Plan for Cover Material at the Red Dog Mine, Alaska, the plan lacks quality control measures detailing how random sampling will assure that cover material meets the sulfur guidelines of the plan.	<p>Cover material is temporarily stored in stockpiles until its final placement as cover. Given the temporary nature of cover material stockpiles and that there are no performance criteria for those stockpiles, in situ sampling of cover material during intermediate storage is unnecessary.</p> <p>No changes were made based on this comment.</p>

Comment #	Commenter	Comment	Comment Response
6	CSP2	This comment concerns <i>IWMP Appendix D – Monitoring Plan August 2016</i> . The plan needs to incorporate some additional quality assurance/quality control measures, especially for mine procedures which if they do not go as projected, could lead to significant long-term problems. This is the case for cover rock separation, mine dam construction rock, and waste rock blending. The monitoring plan echoes the procedures outlined in the operating procedures for these elements. But how does one know if these procedures are effective? The monitoring plan needs to provide that feedback information.	<p>Regarding cover material, see response #5.</p> <p>Regarding dam construction rock, see response #2.</p> <p>Regarding waste rock blending, see response #4.</p> <p>No changes were made based on this comment.</p>
7	CSP2	This comment concerns <i>Reclamation and Closure Plan Red Dog Mine, Alaska, USA August 2016 (RCP)</i> . In section 3.2.3 Water Cover , it details plans for a water cover when closing the Tailings Storage Facility (TSF). A dry closure of the TSF should be considered as part of the next reissuance of the Reclamation and Closure Plan.	<p>The TSF as designed and operated is fully compliant with Alaska statutes and regulations.</p> <p>No changes were made based on this comment.</p>
8	CSP2	Use a net discount rate of 3% in the net present value (NPV) calculation for the required financial assurance.	<p>A net discount rate of 4.3% was used to determine the required financial assurance for reclamation, long term care, and water treatment for the site. This net discount rate was derived by designing a conservative investment portfolio consisting of large company stocks, long-term corporate bonds, intermediate-term government bonds, and long-term government bonds. Then historical annual results for bond and equity performance, tax rates, management fees, and inflation were analyzed. Examination of the data indicated that 4.3% is a reasonable and probable net discount rate.</p> <p>No changes were made in response to this comment.</p>

Comment #	Commenter	Comment	Comment Response
9	TAK	Draft guidelines for mine closure and reclamation cost estimation that have been developed by the State ought to consider or incorporate stakeholder input and then be finalized.	DEC and DNR are working toward finalizing this guidance. No changes were made based on this comment.
10	TAK	Based on extensive experience with long term monitoring and water treatment for both operating and closed mines, Teck believes that the bond grossly overestimates the costs for long term water treatment.	DEC and DNR are obligated to bond for the specific circumstance where TAK defaults, and the State must reclaim and close Red Dog Mine. Closure costs estimate how much it would cost for the State to hire and manage a contractor to perform water treatment in perpetuity. Since the State has no experience with long term water treatment and in a default situation TAK is unavailable to perform the work, the State would have to hire an entity to perform the long term water treatment at considerably greater expense than TAK has experienced. No changes were made based on this comment.
11	Pexton	DNR should obtain a signed and notarized statement by the landowner giving TAK permission to operate throughout the permit/approval term.	Notarized landowner permission for the permit/approval term was secured as part of the permit/approval application process. No changes were made based on this comment.