

Executive Summary

Permits and authorizations issued by the Alaska Department of Natural Resources (ADNR), Division of Mining, Land, and Water and Alaska Department of Environmental Conservation (ADEC) include requirements for mining operations to conduct periodic environmental audits. Teck Alaska Incorporated (TAK) contracted AECOM Technical Services, Inc. (AECOM) to conduct an audit of their Red Dog Mine operations consistent with requirements established in ADNR's Final Red Dog Mine Reclamation Plan Approval No. F20099958 (RPA) and ADEC's Waste Management Permit (WMP) 0132-BA002. Both permits specify that TAK will conduct third-party, objective, systematic, and documented audit every 5 years starting in 2013.

The audit was conducted on the Red Dog Mine site August 24- 28, 2014. A desktop review of the closure cost estimate documents was completed subsequent to the site visit. Additionally, the audit included a review of files and interviews with agency representatives at ADNR, ADEC and the Alaska Department of Fish and Game (ADF&G).

A draft report was issued to the ADNR, ADEC and TAK in January 2014. The draft report was modified to respond to agency and TAK comments and issued as a final in May 2014. The audit provides a review of TAK's performance under the current permits and approvals and identifies areas for improvement as TAK prepares to update the Red Dog Mine Closure and Reclamation Plan (CRP) and associated closure cost estimates required in 2014. Additionally, the audit was structured to assist ADNR and ADEC in assessing TAK compliance with the existing authorizations and in evaluating whether modifications are necessary for the upcoming permit/authorization renewals.

The audit focused on on-site features and activities within the audit boundary that are directly related to the RPA, WMP, and existing CRP, including the following:

- Tailings Area
- Inert and camp solid waste landfills
- Waste rock stockpiles
- Ore stockpiles
- Main, Aqqaluk, and Qanaiyaq pits
- Groundwater and surface water – water rights, collection, treatment, monitoring systems
- Hazardous chemical storage and containment
- Closure cost estimate/financial responsibility, which includes all costs associated with closure including demolition, reclamation, and post-closure monitoring
- Characterization of acid rock drainage and seepage collection systems
- Reclamation and closure activities for the tailings, waste rock, and mine pits, including disposal to the mine pits as approved

The audit report includes a detailed table presenting the audit criteria, audit observations, findings and recommendations. Each audit observation was assigned to one of the following four categories:

- Positive/In Conformance – indicates the audit record observations were in accordance/compliance/conformance with the audit criteria.

- Improvement Needed – indicates that while the audit record observations are technically in conformance with the audit criteria, improvement in facility, control, action, and/or documentation is suggested.
- Non-conformance – indicates the audit record observations are not in accordance/compliance/conformance with the audit criteria.
- Update 2014 – indicates that the audit record is in conformance with the requirements laid out by the permits in 2009, but significant changes have been made since the approval of the RPA and issuance of the WMP. Attention to updating the aspect tied to the record number in the 2014 permit renewal process is required.
- No Finding – indicates that the document or aspect was not reviewed during this audit and/or there were no auditable conditions.

The audit report includes sections correlating the audit results to the five audit objectives specified in the WMP and RPA and providing recommendations intended to assist in the document update for the 2014 renewal process. The primary conclusions (presented by audit objective) are as follows:

1. Objective: TAK's Compliance with the Approvals, Permits, and Applicable Environmental Laws and Regulations

The auditors found TAK to be generally compliant with the WMP, RPA, permit supporting documents, laws and regulations that were reviewed within the scope and boundary of this audit. This conclusion was supported by the relatively low incidence of permit violations, compliance issues, missed reporting deadlines, and other non-compliance indicators. Exceptions to this general compliance conclusion are listed below:

- Waste rock from the Aqqaluk Pit has been placed either in the Main Waste Stockpile or waste stockpiles forming a berm around a portion of the Main Pit instead of within the Main Pit as described in the CRP May 2009.
- TAK did not develop and submit to ADNR preliminary plans and cost estimates for eventual "out-of-pit" sludge disposal.
- TAK was unable to supply updated landfill development and land use plans required by the WMP.
- TAK was unable to supply information to verify that an oil water separator exists in the shop as required by the WMP.

2. Objective: Controls Provide Reasonable Assurances and Controls are Functioning

Controls evaluated by the audit team were generally functioning as intended and provide reliable compliance with applicable requirements. These controls, however, have been modified from the WMP and the RPA by TAK. Water and waste rock management are the most significant sources of potential environmental concern at the site. Control-related documents need to be updated during the permit renewal process.

3. Objective: Permit Conditions Provide Environmental Protection as Required

Requirements in the current WMP and RPA provide the necessary environmental protections based on operations in effect at the time of drafting and approval of these permits. However, recent changes in mine operations necessitate these permit conditions be re-examined to ensure adequate environmental protection particularly with respect to water management in the Main Pit, storage and segregation of waste rock, and the cover design being tested on the Oxide Stockpile.

4. Objective: Facility Management and Regulatory Oversight Provide Reasonable Assurances

Facility management and regulatory oversight provide reasonable assurances that the facility and controls are functioning as intended. Employees are intimately familiar with the operations and numerous members of the TAK team have worked at the mine for a significant period of time. Their familiarity with the site and institutional knowledge results in a climate that the audit team perceived to be proactive and solution-oriented. The staff and management demonstrate the qualities necessary to provide reasonable assurance that facility controls are functioning as intended.

The State Large Mining Permitting Team consists of representatives of ADNR, ADEC, and ADF&G that are assigned to specific mining projects. The State team assigned to Red Dog meets regularly and, based on the interviews conducted at their respective offices, communicate regularly in regard to the project. Team members are familiar with their own responsibilities as well as those from other divisions/departments which appears to make an effective and efficient approach to achieve the objective on a programmatic and project-specific basis.

5. Objective: Financial Assurance is Adequate

AECOM reviewed the reports and spreadsheets documenting the closure cost calculations. While the audit did not involve a line by line review of every component in the financial assurance calculations the team did determine that the range of items included, and the underlying assumptions were reasonable and sound. The audit identified a number of items that have changed since the last estimate was established. Those items will need to be revisited with the development of the next financial assurance estimate.