

**Oregon Consolidated Application and Permitting Process – Chemical Process Mine  
Calico Resources USA**

**TECHNICAL REVIEW TEAM (TRT) – Meeting Notes**

**Date:** February 2, 2023; 10:00 AM – 12:00 PM PT

**Location:** Zoom teleconference, with public access by phone or online

**Purpose:** To review agency comments concerning the revised Consolidated Permit Application (CPA) materials.

<i><b>Attendees</b></i>	<i><b>Agency or Affiliation</b></i>
Sarah Lewis	Oregon Department of Geology and Mineral Industries (DOGAMI)
Ruarri Day-Stirrat	DOGAMI
Dayne Doucet	DOGAMI
Bob Brinkmann	DOGAMI
Alex Lopez	DOGAMI
Becky Johnson	DOGAMI
Ron Doughten	Oregon Department of Environmental Quality (DEQ)
Randy Jones	DEQ
Heidi Williams	DEQ
Pat Heinz	DEQ
Kendra Girard	DEQ
Phil Marcy	Oregon Water Resources Department (OWRD)
Shane James	Oregon State Historic Preservation Office (SHPO)
Alison Uno	Stantec
Cameron Curtis	Stantec
George Fennemore	Stantec
Rachel Goldman	Paramount Gold
Carlo Buffone	Paramount Gold
Glen Van Treek	Paramount Gold
Christos Theodossiou	Paramount Gold
Heather Bartlett	SLR
Tom Segal	Oregon Department of Fish and Wildlife (ODFW)
Joy Vaughn	ODFW
Nigel Seidel	ODFW
Daniel Pike	US Bureau of Land Management (BLM)
Jackie Cupples	US Fish and Wildlife Services (USFWS)
Jeremy Buck	USFWS
Jesse Radcliffe	Oregon Department of Justice (DOJ)
<i><b>Attendees (cont.)</b></i>	<i><b>Agency or Affiliation (cont.)</b></i>
Peggy Lynch	League of Women Voters of Oregon
Eric Evans	Malheur County
Tom Vialpando	City of Vale
Pete Danko	Portland business
Sierra Watson	No affiliation provided
K Schrool	Nyssa resident

**Agenda:**

<b>Time</b>	<b>Agenda Topic</b>
10:00 am	Welcome and Introductions
10:10 am	Revisions to the Agenda
10:15 am	Stantec Presentation on Technical Questions
10:50 am	Break
11:00 am	Cultural Resources Baseline Data Report (BDR) status
11:30 am	Environmental Evaluation Discussion
11:55 am	Meeting Conclusion and Final Remarks
12:00 pm	A D J O U R N

**Notes:**

---

**Introduction**

- Meeting introduction by Alex Lopez, DOGAMI
- Call in details were provided in the comments section and notice was given that the meeting was being recorded.
- Public comment was not taken during this meeting.
- Dayne Doucet, DOGAMI, coordinated introductions of TRT members.

**Agenda**

- Reviewed by committee members; Dayne Doucet suggested a minor addition and proceeded to give a brief presentation on the progress of the Consolidated Permit Application (CPA) comments. This presentation showed significant progress in resolving outstanding comments.

**Stantec Presentation on Technical Questions**

- George Fennemore, Stantec (the lead technical consultant under contract with DOGAMI), provided information and responses to some of the technical questions on the CPA – specifically the Tailings Storage Facility (TSF) design and the mill design.
- TSF design by Golder Associates, with Oregon Professional Engineer licensing.
- TSF design incorporates OAR 340, 632, 635, & 690.
- Factor of Safety developed in consultation with OWRD.
- Zero-discharge facility.
- Containments with leak detection for process solution in impoundments, channels, piping, and other systems.

- Depth to groundwater is more than 120 feet (no upward pressure on liner).
- TSF water balance accounts for 500-year, 24-hour storm event (deterministic water balance).
- Tailings supernatant pond appears to be in direct contact with primary liner on the eastern side of the tailings impoundment.
- Operating Maintenance and Surveillance (OMS) Manual and Emergency Action Plan would be prepared prior to operation.
  - OMS Manual should include observations of the avian and wildlife protection measures plus groundwater levels and water chemistry downgradient of the TSF.
- Randy Jones, DEQ, asked a question about tailings grain size and sealing performance.
  - The mill is designed to grind a small grain size (silt / clay size), which would create a low permeability layer that is beneficial to have on top of the liner.
- Randy Jones, DEQ, asked a question about best available technology.
  - The cyanide destruction area is designed to achieve cyanide concentrations below a certain limit (below toxicity levels to wildlife). Metals would be managed with containment, which is a best practice and the industry standard.
- Field and laboratory testing was conducted to characterize the subgrade materials and select their depth.
- Liner repair is generally not feasible during operations for all instances; leakage minimized operationally.
- Bob Brinkmann, DOGAMI, made a comment about the monitoring well plan.
- The types of leak detection systems have been effective in identifying seepage through TSF liners, so that tailings management can be implemented to address the seepage and limit potential effects to receiving water quality.
- While the facility is designed with fencing, the tailings design document does not describe the fencing or how it would be protective of wildlife.
- The preliminary closure plan calls for the placement of an evapotranspiration soil cover, while OAR 340-043-0150 calls for use of a “composite cover designed to prevent water and air infiltration”.
- The tailings design references groundwater monitoring using the site groundwater production wells, but does not describe how these wells would be located and utilized to monitor potential tailings impoundment effects on groundwater.
- Randy Jones, DEQ, asked a question about whether an evapotranspiration soil cover is adequate.
  - In an arid climate, an evapotranspiration soil cover is effective in shutting off water, but not shutting off oxygen movement through the air. However, the driving force of the leaching is reduced.
- Jeremy Buck, ODFW, asked a question about what the fencing is protecting the wildlife from and what are the major receptors the fencing would prevent.
  - Currently, there is no detail on the design of the fence. Fencing does little for avian species, but a chain link fence would prevent large mammals from entering the process areas. It would be useful to see the specific design of the fence.

- Other than alternative locations, the requirements around TSF designs for conventional tailings disposal are fairly prescriptive. Different thicknesses of subgrade, pipe sizes, etc. could be used, but these are generally not material to the environmental protectiveness of the TSF design once these components have been initially designed to meet protective criteria.
- Alternative Tailings Management: Filtered and Stacked Tailings
  - Creates filtrate water and tailings “cake” in place of tailings slurry
  - May affect zero-discharge design
- Alternative Tailings Management: Paste Tailings
  - Used underground as backfill
  - Reduced surface management
  - Increased cement delivery and usage
- Free cyanide is a subcomponent of weak acid dissociable (WAD) cyanide, which is the cyanide that is already complexed with other metals. WAD cyanide is always greater than the free cyanide.
- A quantitative relationship between free cyanide and WAD cyanide would only be determinable from metallurgical testing and/or monitoring of the facility.
- Randy Jones, DEQ, asked if Stantec looked at toxicity to wildlife thresholds.
  - Stantec did not look at toxicity thresholds. Generally there is a threshold for cyanide that is typically based on a WAD cyanide analysis.
- Jeremy Buck, ODFW, asked what types of metals would be complexed with the cyanide. He expressed concern with metals, especially copper, leaking into nearby waterbodies.
  - The metals strongly associated with cyanide include gold, silver, copper, and zinc. The concentration of metals in WAD cyanide would depend on their concentrations in the ore itself. As cyanide breaks down, these associated metals are present in more oxidized forms in mine waste streams.
- Mill design by Ausenco with Oregon Professional Engineer Licensing
- Secondary containment for processing materials and solutions – at least 110% of the largest container volume plus allowances for a 2.28 inch, 24-hour storm event.
  - Water stops are conventionally included in concrete containment designs to protect against process solutions existing containment through joints and seams in the concrete.
  - Concrete coatings are only described for hydrochloric acid areas.
  - Designs typically describe how spills would be evacuated from containments.
- The design includes equipment and infrastructure for the detoxification and neutralization of cyanide in the mill tailings. When combined with personal protective equipment and industrial hygiene controls during operations, these control measures are typical for mill facilities.
- Mercury controls include a retort to collect elemental mercury from the refining processes. Gas scrubbers are equipped with mercury control carbon beds for absorption of mercury from the gas streams.
  - Prior to construction, air quality permits typically require a Maximum Available Control Technology (MACT) analysis of the mercury control devices to confirm that they are up to date per industry and regulatory standards.
- The design report references the site reclamation plan regarding decommissioning and closure. That reclamation plan calls for the dismantling, salvage, sale, or authorized off-site disposal of mill

infrastructure. Non-movable mill components such as slabs and foundations would be recontoured in place.

- In addition to these proposed measures, a closure-period inspection of process facility components for contamination is common practice prior to closing those components in place. If contamination is identified, appropriate remediation is undertaken prior to recontouring the components in place.
- The site has a negative water balance. While a negative water balance does not preclude acid-generation, it does limit the acid-generation rate.
- The use of inert rockfill and 7% cemented rockfill add neutralization potential that precludes acidic drainage in the backfilled portions of the underground.
- In unbackfilled areas, exposure rock is covered with cement ground support which limits the exposure of sulfides to air and water. Acidic drainage could occur where sulfide concentrations are very high. These instances are rare and location-specific, and can be addressed via additional cement at the specific locations.
- Randy Jones, DEQ, asked what Stantec sees across the industry in regards to monitoring of acid rock drainage.
  - Monitoring of acid rock drainage is typically carried out during operations and is a requirement of both the environmental permits and mine health and safety plans. Red iron staining appears in areas with acid rock drainage, and in worse situations, seepage would be seen. The application of additional cemented supports is then placed in these areas to address such issues quickly. Frequent sampling of rock fill (RF) and cemented rock fill (CRF) as it is being placed, is the best way to monitor for acid rock drainage (rather than trying to monitor after placement).
- The best monitoring technology would involve collecting a quarterly sample of the RF and CRF and submitting them for acid-base accounting analysis and a Meteoric Water Mobility Procedure laboratory test. This would confirm the pH and leachability of these backfill materials.
- Once placed in the underground workings, the backfilled materials are physically and geochemically stable. During operations, inspections of the backfill could be used to note any seepage and its seepage chemistry. Following operations and the closure period, direct observation of the backfill performance is difficult as the groundwater recovers into the mine workings when dewatering ceases. At this point, any further oxidation of sulfide minerals becomes inhibited by the groundwater's displacement of atmospheric oxygen which is a necessary component of the oxidation reaction. In the closure and post-closure periods, affects of RF and CRF on groundwater chemistry can be monitored via groundwater monitoring wells downgradient of the underground workings.
- Phil Marcy, OR Water Resources Dept. (WRD), asked about acid mine drainage post-closure and whether there is anything that can be done once the mine is closed and acid mine drainage is detected in one of the monitoring wells.
  - The best method to prevent oxidation (and acid generation) is to reduce the amount of time that the mine is exposed to air and water (reduce the period between shutting off the air and the mine filling with water). Post-closure, additional work to prevent water contamination is limited (e.g., treating affected groundwater).

### **Cultural Resources Baseline Data Report (BDR) status**

- Shane James, OR SHPO, explained the requests for updates to the Cultural Resources BDR. Sections of the BDR Work Plan, discussing significance and effects, were not adequately developed. SHPO suggested modifying the Work Plan now in order to address these issues. Effects to cultural resources would be better addressed with this revision and also through the state process and National Environmental Policy Act (NEPA) reviews.
- The voting members of the TRT accepted and approved the request to modify the cultural resources BDR work plan. SHPO stated that the baseline survey information meets the criteria in the work plan.
- The TRT accepted and approved the revised 2019 cultural resources BDR. All baseline data reports for the project have now been accepted and approved.

### **Environmental Evaluation (EE) Discussion**

- A draft EE Outline was developed and shared with the TRT. Per Oregon regulations, the scope of the EE shall be determined by the TRT. DEQ will be relying on ODFW to evaluate and ensure that project effects to fish and wildlife are appropriately addressed.
- ODFW suggests including a specific analysis of impacts to spring flows, either in the water resources or aquatic sections of the EE. ODFW staff are discussing potential mitigation for effects to biological species.
- The TRT would like a presentation by Stantec on the EE Outline and scope. DEQ would like an additional appendix added to the EE outline: Appendix C: An assessment of acid rock drainage. At the next meeting, Stantec will present the EE outline and scope.
- TRT members should provide questions or suggested revisions to the EE to DOGAMI as soon as possible so they can be incorporated into the EE outline discussion.
- DEQ suggested that work begin on collecting information for the EE to avoid delays and to keep in step with the current BLM analysis.

### **Final Remarks**

- Calico was given an opportunity to give a project status update.
- The TRT meeting was adjourned at 11:48am.