



**MEETING SUMMARY
TECHNICAL REVIEW TEAM – Water Resources Subcommittee
GRASSY MOUNTAIN GOLD MINE PROJECT**

**May 7, 2018
1:00 pm (Pacific)
Teleconference with Public Access at the DOGAMI - Albany Offices**

Attendance:

Committee Members

- Randy Jones, Oregon Department of Geology and Mineral Industries (DOGAMI)
- Bob Brinkmann, DOGAMI
- Jim Billings, Oregon Department of Environmental Quality (DEQ)
- John Dadoly, DEQ
- Rick Hill, DEQ
- Larry Knudsen, DEQ
- Phil Marcy, Oregon Water Resources Department (WRD)

Others in Attendance

- Rachel Weisshaar, Oregon Department of Justice (DOJ)
- Nancy Wolverson, Calico Resources
- Rich DeLong, EM Strategies
- Jason Thompson, SPF Water Engineering
- Terry Scanlan, SPF Water Engineering
- Larry Meyer, Argus-Observer
- Dan Morse, Oregon Natural Desert Association
- Peggy Lynch, Oregon League of Women Voters
- Adam Bonin, Cardno
- Janet Gillaspie, Environmental Strategies

1. Introductions

Randy Jones, DOGAMI, convened the meeting at 1:03 pm. He said this was a public meeting and the meeting was being tape recorded. He reminded the group that the Technical Review Team (TRT) does not take public comments at its meetings.

The group introduced themselves, including TRT Water Resources Subcommittee members and others participating in or listening to the call.

Jones indicated there was a specific task before the TRT Water Resources Subcommittee; to review the Calico Resources request to revise the approved water resources baseline data proposed methodology. Calico's consultant, SPF Water Engineering, submitted a baseline data adjustment request to DOGAMI on March 22, 2018. The request is to *not* drill the planned shallow upgradient well, if no shallow water zone is encountered in drilling the deep upgradient well.

2. Review of Agenda and Additional Items to Add

Jones asked the Subcommittee if there were additional items to add to the agenda or other modifications to suggest for the agenda. There were none.

3. Review of Procedures for Reviewing Adjustments to the Approved Environmental Baseline Data Work Plans Methodologies

Jones explained the procedures outlined by the Oregon Department of Justice for reviewing requests to modify previously approved environmental baseline data work plan methodologies. He indicated that public notice was provided for the TRT Subcommittee meeting.

Jones said members of the Subcommittee will develop a recommendation for the full TRT meeting, set for May 15, 2018. Public notice has been provided for the full TRT meeting.

The final decision of the TRT will be provided to Calico by letter.

4. Review of Monitoring Well Drilling Approval

In late 2016, the water resources monitoring wells drilling baseline proposal was approved by the TRT Water Resources Subcommittee; the baseline data methodologies were approved by the full TRT in January 2017, said Jones.

The TRT Water Resources Subcommittee has been receiving and reviewing water resources data from the Calico site on a quarterly basis for many years.

A key aspect of the water resources baseline data is to install both upgradient and downgradient wells, constructed in pairs. The goal is to better understand the overall deep hydrology of the immediate area and the potential impact of the proposed mine on water resources. This is important for both water quality and water quantity issues.

The proposal from Calico is an adjustment to the baseline methodology for water resources baseline data and is intended to address unanticipated conditions. The proposal addresses the possibility that there is no shallow aquifer encountered in the drilling of the upgradient deep well, said Jones.

5. Review of Proposed Adjustment to Approved Methodology for Monitoring Wells Drilling Program

Jones asked Calico and its consultants to review its request. Nancy Wolverson with Calico asked SPF Water Engineering to review the current well drilling status and provide a summary of the request.

Jason Thompson with SPF Water Engineering started with an update on the upgradient deep well drilling progress; the well driller has reached 525 feet; the planned well completion is anticipated between 900 and 1,000 feet. As of May 6, 2018, no water has been encountered.

Thompson continued that the wells are being drilled by air rotary with casing advancement. By using casing advancement, the hole stays open and does not cave. Air rotary is injecting air at a high rate to remove cuttings; any water in the bore hole would be lifted out with the cuttings. That method allows a determination if water is present.

To the current drilling depth, the drilling is stopped at the end of each day; the next day, drilling starts by first blowing air out of the hole; if there was water, it would be lifted out at the beginning of drilling on the next day. No water has been encountered to date, said Thompson.

The work plan revision request is to not construct the shallow upgradient well if there is no water encountered at a shallow depth while drilling the deep upgradient well.

Bob Brinkmann, DOGAMI, asked if the well was near the ore body, as shown in Figure 1 of the approved work plan. Yes, said Thompson, and indicated it was also shown as Figure 1 in the Calico/SPF adjustment request, dated March 22, 2018.

John Dadoly, DEQ, clarified that the well being described was on the south side of the ore body. Thompson concurred and affirmed this was true. Dadoly indicated that at 480 feet, it was below the level where water was encountered at the other well locations.

Thompson indicated that there is a good monitoring network of shallow wells at the site. Using that information, he continued, the shallow aquifer downgradient is an elevation of about 3,550 feet as described in the March 22, 2018 request.

Dadoly asked about the rate of drilling per day; Thompson indicated if the drilling is through rock, the driller can make good progress. The inter-bedded clay at the site does not do well with the rock bit, and it can be very slow; 5 – 10 feet per day. The amount of drilling accomplished is rock-dependent.

April 17, 2018 was the drilling start date for the upgradient deep well currently being drilled; the driller has not been drilling on the weekends, said Thompson. The drilling is proceeding at a pace of maybe 50 – 100 feet per day, said Thompson.

Dadoly asked about the casing; Thompson indicated that casing has been laid to 355 feet and is now a 12-inch hole that is stable. It is faster to drill with an open hole, said Thompson. In the area where you would expect water, there has been an open hole for several days and no water has been encountered, added Thompson.

Brinkmann asked if the lithology being encountered was consistent between other downgradient and upgradient wells installed; it has been consistent said Thompson.

This is very challenging drilling, highlighted Thompson.

Rick Hill, DEQ, asked if water was added during the drilling process. Thompson indicated the driller is using foam and not adding any additional significant amounts of water to remove the cuttings.

Jones asked about the new downgradient wells – three new wells have been installed to date. He asked if there is any additional information on the static water levels or water quality from those wells.

Thompson indicated the wells have been test pumped and sampled for water quality. The plan is to complete the deep well and test pump it, and then look at all the data and prepare a single report on the construction and testing of the new wells.

Thompson continued that the existing well number 59762 (MALH2976) did not yield adequate water for substantial testing (only two hours of flow was available); a water quality sample was secured, he said.

The nearby two deep wells have similar, limited productivity, Thompson said.

Thompson added that the downgradient shallow wells nearby yields varied between 20 and 30 gallons per minute, over 4 days, but then hit a hydraulic barrier and water production was limited due to a barrier. There is water in a pocket, but it can be dewatered quickly. Jones indicated that the known faulting system is likely affecting groundwater production.

Jones asked SPF's opinion on the hydrochemistry in the area, focused on the differences between calcium sulfate and sodium sulfate levels related to the continuity of the shallow aquifer system.

Thompson said that the highly calcified system does not yield water easily; the faults are affecting groundwater flow and movement. The fact that there is no shallow water in the upgradient well is not that surprising, said Thompson. Water in the proposed mine area is very sporadic and there is not an obvious pattern.

Brinkmann referenced the Adrien Brown Consultants (ABC) report, 1992; it also showed that similar wells drilled at the site were dry. What is being observed regarding the lack of water is not surprising, he said.

Jones asked Phil Marcy at WRD if the current information (no water encountered at around 500 feet to date) is surprising. Not surprising, concluded Marcy.

Marcy asked about the test pumping of the downgradient shallow wells – did the well recover, and if so at what rate. Thompson indicated that the recovery was being monitored and provided additional information; the well has recovered to about the same level.

Jones confirmed that all the information from the drilling program will be submitted to the TRT in a consolidated report, and that the report would include the well drilling logs.

Marcy asked if Calico has considered modifying its water right permits to secure adequate, usable water for mining. Wolverson indicated that Calico has not considered any modifications, awaiting the final report.

Dadoly added that there is no water to about 500 feet, but that the drilling will continue. What is the drill plan, he and Hill asked. Thompson indicated that the plan is to keep drilling, and the anticipated water encounter level is predicted at 3,200 feet, equating to about 750 – 950 feet in drilling. The depth of the well will be below the deposit, into the tuff. The well will be completed at this depth. Thompson

indicated that the well will be cased; if the hole is stable, they will install a 5-inch stainless casing to the top of the screen, and seal from the top of the water bearing zone to the surface. Dadoly confirmed that the screen could be between 750 – 900 feet.

Thompson indicated that SPF was fairly confident that water would be encountered between 750 – 900 feet.

Jones asked SPF about groundwater flow. Thompson indicated that the shallow groundwater is likely flowing northwest or north/northwest; the deeper flow seems to be to the northwest, but additional data will provide more information.

Brinkmann asked if SPF has confirmed that there is a deeper aquifer at the site. Terry Scanlan, SPF Water Engineering, and Thompson agreed that there is a deeper aquifer, but it is very low yield.

6. Discussion

Jones asked for a recommendation from the TRT Water Resources Subcommittee.

Jones moved that the TRT Water Resources Subcommittee conclude that it has reviewed and discussed the proposal from Calico dated March 22, 2018 to adjust the water resources baseline data, to remove the shallow upgradient well if no water is encountered at shallow depths in drilling the deep upgradient well, while maintaining the other well installation program as approved.

Jones asked for objections to his motion; there were none.

Dadoly indicated that the proposal was acceptable.

Larry Knudsen with DEQ suggested that the Subcommittee move forward by unanimous consent. Rachel Weisshaar with DOJ had no additional comments.

7. Subcommittee Recommendation to TRT

Jones asked for unanimous consent that the Calico proposal of March 22, 2018 be forwarded to the TRT with a recommendation for approval.

Jones indicated that the quarterly water resources monitoring information is important and useful information.

There were technical difficulties with the conference call system and the meeting was unintendedly concluded at 2:00 pm.