



COLORADO

Division of Reclamation, Mining and Safety

Department of Natural Resources

1313 Sherman Street, Room 215

Denver, Colorado 80203

November 18, 2016

Jack Henris
Cripple Creek & Victor Gold Mining Company
100 North Third Street
Victor, CO 80860

RE: Adequacy Review #2; TR-81; Cresson Project; Permit No. M-1980-244

Dear Mr. Henris,

On November 16, 2016, the Division received the Operator's response to the Division's preliminary adequacy letter for TR-81, dated September 6, 2016. The Division has reviewed the content of TR-81 and the November 16, 2016 adequacy response and submits the following comments. Adequacy items 5, 8 and 9 correlate with the adequacy issues previously raised. Adequacy items 13, 14 and 15 are new adequacy issues not previously raised. Please be advised TR-81 may be deemed inadequate and denied on November 30, 2016, unless the following adequacy items are addressed to the satisfaction of the Division.

5. Response to adequacy item 5 is inadequate.

The Operator has represented the capacity of the existing secondary containment structure as 17,039.262 cubic feet. The Division disagrees. Based on information provided in the submittal, the Division has calculated the existing capacity as 13,797 cubic feet. This was determined by subtracting the areas consumed by the "intrusions" located below the height of the containment wall. Based upon site observations, the Division estimates the height of the eight vat leach tank foundations at 2.5 feet, or the same elevation as the crest of the existing containment wall. The following table provides a summary of the calculations.

Existing Containment Area	11,444.54	ft. ²
Intrusions Within the Existing Containment Area:		
• 8 Tank Foundations (8 * 730.62 square feet)	5,844.96	ft. ²
• 2 Column Piers (2 * 4 square feet)	8.00	ft. ²
• 19 Perimeter Piers (19 * 1.25 square feet)	23.75	ft. ²
• 1 Stair Platform (1 * 49.03 square feet)	49.03	ft. ²
Total Intrusions Area	5,925.74	ft. ²
Available Area (11,444.54 square feet) - (5,925.74 square feet)	5,518.80	ft. ²
Existing Available Capacity (5,518.8 square feet * 2.5 feet deep)	13,797	ft. ³

8. Response to adequacy item 8 is inadequate.

The Operator's response indicated an upset condition might not be discovered for four hours. However, the Operator's response did not include information regarding the maximum amount of time to shut down



the leach circuit after an upset condition is discovered. Please provide the Division with the maximum time to shut down the necessary processes, whereby slurry delivery to the leach tank battery ceases, after an upset condition is discovered.

9. Response to adequacy item 9 is inadequate.

The Operator's response did not include information regarding the status of the active leach circuit and milling operation, in the event the capacity of the secondary containment structure cannot be fully reestablished within seven days after an upset condition. If clean out of the secondary containment structure requires more than seven days to accomplish, please commit to ceasing the leach circuit operations until the secondary containment capacity is fully reestablished.

13. Please explain the discrepancy between the calculated 137,554 gallon capacity of one vat leach tank and the proposed 173,000 gallon capacity as described in AM10 documents.

14. The Operator proposes to increase the height of the secondary containment wall by one foot, to ensure the containment of 110% of one vat leach tank. Pursuant to Rule 6.4.21(7)(f), the Division has determined the proposed capacity of the secondary containment to be insufficient.

Pursuant to Rule 6.4.21(7)(f), the secondary containment structure must have sufficient capacity to ensure containment of the following:

- all precipitation generated by the 100 year, 24 hour storm event, which is captured by the secondary containment area
- the total volume of one leach tank
- the volume of process slurry pumped to the tank battery before an upset condition is discovered (four hours to discover an upset condition, see item 8 above)
- the volume of process slurry pumped to the tank battery after the upset condition is discovered but before pumping to the tank battery ceases (unknown time, see item 8 above)

Based on information provided in the submittal, the Division has calculated the total volume needed is at least 25,581.09 cubic feet. The following table provides a summary of the calculations.

Precipitation (3.5 inches * 11,444.54) - (5 Tanks * 656.73 square feet)	2,380.26	ft. ²
Volume of 1 Tank (28 feet * π * 14.4583 ²)	18,388.33	ft. ²
Process Slurry (150 gpm * 240 min) / (7.48052 cubic feet per gallon)	4,812.50	ft. ³
Process Slurry (150 gpm * ? min) / (7.48052 cubic feet per gallon)	?	ft. ³
Total Volume Needed	25,581.09	ft. ³

In order to contain this volume, the Division has calculated the height of the secondary containment will need to be increased by at least 1.45 feet (1 foot - 5.4 inches). This was determined by subtracting the areas consumed by the "intrusions" located above the height of the containment wall and using the volume remaining after the existing containment area is consumed. The following table provides a summary of the calculations.

Proposed Containment Area	11,444.54	ft. ²
Intrusions Above the Containment Area:		
• 5 Tank (5 * 656.73 square feet)	3,283.65	ft. ²
• 2 Column Piers (2 * 4 square feet)	8.00	ft. ²
• 19 Perimeter Piers (19 * 1.25 square feet)	23.75	ft. ²
Total Intrusions Area	3,315.4	ft. ²
Available Area Above (11,444.54 square feet) - (3,315.4 square feet)	8,129.14	ft. ²
Volume Needed Above (25,581.09 cubic feet) - (13,797 cubic feet)	11,784.1	ft. ²
Height Increase Needed (11,784.1 cubic feet / 8,129.14 square feet)	1.45	ft.

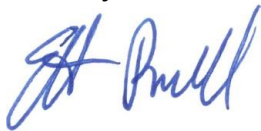
Please note, the calculation of 1.45 feet was determined by assuming there is not a Vat Leach Tank #7 or #8, thus this area could be used as potential capacity. If the Operator intends to install these additional vat leach tanks, the height of the secondary containment will need to be increased by at least 1.73 feet (1 foot - 8.8 inches) at that time or during this current planned enhancement.

15. Please respond to the adequacy issues identified by Tim Cazier in the attached memorandum, dated November 18, 2016, RE: FL Smidth Engineering Drawing Review.

This concludes the Division's adequacy review of this Technical Revision. This letter shall not be interpreted to mean that there are no other technical deficiencies in your request. Other issues may arise as additional information is supplied. Please be advised TR-81 may be deemed inadequate and denied on November 30, 2016, unless the above mentioned adequacy review items are addressed to the satisfaction of the Division. **If more time is needed to complete the reply, the Division can grant an extension to the decision date. This will be done upon receipt of a written waiver of the Applicant's right to a decision by November 30, 2016, and the request for additional time. This must be received no later than the deadline date, before November 30, 2016.**

If you need additional information or have any questions, please contact me at the Division of Reclamation, Mining and Safety, 1313 Sherman Street, Room 215, Denver, CO 80203, by telephone at **303-866-3567 x8132**, or by email at elliott.russell@state.co.us.

Sincerely,



Elliott R. Russell
Environmental Protection Specialist

Attachment: FL Smidth Engineering Drawing Review Memo from Tim Cazier, dated November 18, 2016

EC: Erik Munroe; Cripple Creek & Victor Gold Mining Company
Meg Burt; Cripple Creek & Victor Gold Mining Company
Wally Erickson; Division of Reclamation, Mining & Safety
Tim Cazier; Division of Reclamation, Mining & Safety



COLORADO

**Division of Reclamation,
Mining and Safety**

Department of Natural Resources

1313 Sherman Street, Room 215
Denver, CO 80203

Date: November 18, 2016

To: Elliott Russell

From: Tim Cazier, P.E.

RE: Cresson Project, DRMS File No. M-1980-244;
Preliminary Adequacy Review - TR-81, FL Smidth Engineering Drawing Review

The Division of Reclamation, Mining and Safety (Division) engineering staff has reviewed FL Smidth's engineering drawings (Drawing No. 20-647-30, Rev. 2) which includes three drawings, two of which do not have drawing numbers, but include five "Concrete Slab on Metal Deck Bearing on Foundation Wall" sections (referenced on Dwg 20-647-30) on the second sheet, and a third sheet with notes and specifications. The following comments are posed to ensure adequate engineering analyses and design practices are implemented to eliminate or reduce to the extent practical the disturbance to the hydrologic balance expected by the mining operation with respect to water quality and quantity in accordance with Rules 3.1.6(1), 6.4.7, and 7.3.1.

Drawing 20-647-30:

- 15.1. Section callouts. There are five sections shown on the second sheet. This general arrangement drawing shows callouts in red for sections 2, 3, 4, and 5. It is unclear to the Division where Section 1 is to be applied.

Sections:

- 15.2. Rubber membrane concerns. Based on General Note A.4 on the third sheet, it appears to be left up to the contractor to determine how the rubber membrane and ¼" continuous steel plate is transitioned between the four basic configurations shown in sections 1 through 5 (the configuration of sections 1 and 2 are nearly identical). The Division has concerns about the contractor being able to construct a continuous seal given the variability in the section configurations without additional details on how to construct these transition areas.

- a. The Rubber Membrane note on Section 3 indicates it should be wrapped around the steel plate. In order to provide a more adequate seal, the Division believes the rubber membrane should be wrapped around the HSS



10x2x1/4 x Cont. Shim. Please change the drawing note or provide an explanation as to why the change is not needed.

- b. Given the number of perimeter piers, the locations where Sections 1, 2, and 3 apply will have several corners to stretch or fold the rubber membrane. How will corners be handled to prevent pinching, stretching, and cracking of the rubber membrane?
 - c. Transitions between face mounted and top of wall mounted plates is unclear. How will an adequate seal be maintained between:
 - i. Sections 2 and 4 (upper left on Dwg 20-647-30),
 - ii. Sections 5 and 3 (left side on Dwg 20-647-30),
 - iii. Section 4 (membrane wrapped under steel angle to the right) and Section 5 (membrane wrapped under steel angle to the left), and
 - iv. Sections 2 and 3 if the rubber membrane discussed in Comment 2.a is not wrapped around the steel shim.
- 15.3. Membrane splicing. No notes on the Sections discuss the splicing of the rubber membrane. Note D.1 on Sheet 3 indicates the continuous membrane is to be accomplished with a vulcanized splice. Please confirm there will be no “overlap” splices and add at least a general note referring to note D.1 for splices on the sections drawing.
- 15.4. What measures does CC&V intend to take to inspect/ensure long term reliability of the proposed secondary containment system?