



**COLORADO**

**Division of Reclamation,  
Mining and Safety**

Department of Natural Resources

1313 Sherman Street, Room 215  
Denver, CO 80203

December 10, 2014

Mr. Timm Comer  
Cripple Creek & Victor Gold Mining Company  
100 N. 3rd Street  
P. O. Box 191  
Victor, CO 80860

**Re: Cripple Creek & Victor Mining, Co., Cresson Project, M-1980-244;  
Review Comments for Quality Assurance Monitoring & Test Results Final Report for  
Squaw Gulch VLF Pregnant Solution Storage Area Project**

Dear Mr. Comer:

The Division of Reclamation, Mining and Safety (Division) has completed the review of the Quality Assurance Monitoring and Test Results for the Squaw Gulch VLF Pregnant Solution Storage Area Project dated November 2014. Pursuant to Rule 7.3.1(5), no chemicals used in the extractive metallurgical process or toxic or acid-forming materials ... shall be placed in constructed facilities until the Board or Office accepts the certification of the facility, or phase thereof, that precedes placement. The following comments need to be addressed prior to the Division accepting the submitted report:

1. General Comments:

- a. Paper vs. electronic copies of subject report – the Division has utilized both the paper and electronic copies of the subject report for this review and observed some inconsistencies between the hard and electronic copies. Specific discrepancies include:
  - i. The electronic/pdf version the Division downloaded from your ftp site contains duplicate Record Drawing No. 3 of 9 Underdrain As-builts and no Record Drawing No. 4 of 9 Top of Low Volume Solution Collection Fill.
  - ii. Appendix J.7 in file “14.Appendix J-SSMS Install Observations.pdf” should be for the secondary geomembrane. However, this particular electronic sub-appendix is K.7 and addresses the primary geomembrane.
  - iii. Please double check the pdf files on your ftp site to be sure they are consistent with the submitted hard copy and make available to the Division all necessary corrected electronic/pdf files.



- b. Record of Construction Drawings – The Division highly recommends future record drawings be labeled “Record Drawing” vs. “As-built” drawing as is the industry standard. The industry has adopted “Record Drawing” for legal/liability reasons that registered professional engineers and surveyors should become familiar. It is not necessary for the Division’s purposes to revise these drawings to indicate “Record Drawing”.
  2. Drawings – The issued for construction (IFC) drawings presented immediately after the report Figures section all have “Issued for Record of Construction” above the title block. These drawings do not meet the criteria for Record Drawings. The dates on several drawings precede the beginning of construction, and almost all of them precede the completion of the PSSA construction. Industry practice for Record Drawings involves assigning a new revision number with the designation "ISSUED FOR RECORD OF CONSTRUCTION" or "RECORD DRAWINGS" on the revision title block. The reason for this is to demonstrate that the engineer of record has reviewed changes tracked by the engineer and/or the contractor during the construction period. Telephone conversations with CC&V suggest the “Issued for Record of Construction” will be removed from all these drawings and would be an acceptable response to this comment. If a different response is selected by CC&V, please contact the Division prior to submitting a response.
  3. Appendix A, Record of Construction Drawings – Record Drawings 1 and 3 through 7 of the nine drawings submitted as hard copies are adequate as submitted.
    - a. Record Drawing 2 of 9 – Specification 01050, Section 1.05.B, fourth bullet requires Record Drawings include the elevations (i.e., toe of slope, crest of slope and breaks in grade) and locations for Soil Liner Fill. Only five-foot contours are provided, thereby making actual elevations discernable only to  $\pm 2.5$  feet. Please provide Record Drawings depicting the required elevations.
    - b. Record Drawing 8 of 9 – Please specify what surface is depicted by the contours: top of subgrade, top of soil liner fill, etc.
    - c. Record Drawing 9 of 9 – Please specify what surface is depicted by the contours: top of drain cover fill, top of soil liner fill, etc.
    - d. Omitted or Misplaced Record Drawings – Sumps and HVSCS Riser base plates:
      - i. Three PSSA sumps (Closure Drain Sump, Low Volume Solutions Collection System Sump and High Volume Solution Collections Solution Sump) – are critical environmental protection facilities (EPFs) and their relative locations (horizontal and vertical) are critical to the proposed VLF closure plan. The Division requires record drawing(s) depicting the horizontal extents (preferably base/toe and crest/top) of each sump as well as the vertical relationship (including elevations of subgrade, soil liner fill, drain rock tops

of closure drains, primary and secondary geomembrane). This information may be critical in implementing the proposed VLF closure following reclamation. Please provide Record Drawings depicting the horizontal and vertical locations of the three sumps and show them relative to one another.

- ii. Riser Base Plates and Top of Upper Geosynthetics – Specification 01050, Section 1.05.B, seventh bullet requires Record Drawings include the elevations (i.e., toe of slope, crest of slope and breaks in grade) and locations of Top of Upper geosynthetics in the PSSA and the Vertical Riser Sump and base plates. Record Drawing 4 of 9 presents contours of the top of the Low Volume Solution Collection Fill which is for all intents and purposes the top of the “upper geosynthetics” but no elevations are specified, only the five foot contours, thereby making actual elevations discernable only to  $\pm 2.5$  feet. Record Drawing 7 of 9 depicts the riser base plates, but does not specify base plate dimensions, elevations or horizontal locations. Please provide the required elevations.
4. Appendix J, Secondary Geomembrane Installation Observations – Specification 02776, Section 3.02.B, requires geomembrane be accepted by CC&V. Appendix J.7 contains several LLDPE Geomembrane Liner Acceptance Forms unsigned by CC&V. The Division was unable to locate any documentation that confirms CC&V acceptance of these panel sets designated on acceptance forms unsigned by CC&V. Please provide documentation of all secondary geomembrane installation acceptance by CC&V.
5. Appendix K, Primary Geomembrane Installation Observations – Specification 02776, Section 3.02.B, requires geomembrane be accepted by CC&V. Appendix J.7 contains several LLDPE Geomembrane Liner Acceptance Forms unsigned by CC&V. The Division was unable to locate any documentation that confirms CC&V acceptance of these panel sets designated on acceptance forms unsigned by CC&V. Please provide documentation of all primary geomembrane installation acceptance by CC&V.
6. Appendix O, Underground Working Observations – As there is no narrative accompanying Appendix O, the Division requires clarification on the following:
  - a. Appendix O.2, As-built Drawings – The Division concurs a record drawing is relevant and necessary. Figure 1 is not designated a drawing, but a figure, and is not signed and stamped by the registered professional engineer overseeing the underground working remediation efforts. Please provide this figure as a record drawing (see Comment 1b above) and include notes on the drawing indicating:
    - i. All underground working remediated as part of the PSSA construction are located and identified on this drawing (if that is factually correct), and

- ii. Specific underground working locations and elevations of each working identified are presented in Appendix O.1
  - b. Specification 03300, Section 2.02.B, requires 1) Placement slump between 2 inches and 5 inches, and 2) air entrainment of 5% to 8%. The slump did not meet the specification for specimens W-11, W-12 and W-13; and was not field tested for specimen W-8. Air content was only field tested for specimen W-2. Please explain why concrete not meeting and/or not field tested for compliance with specifications was used for underground working remediation.
7. Appendix Q, Closure Drain Installation Summary – the Division requires a response to the following:
- a. The Division concurs a record drawing is essential for the closure drains. Figure 001 is not designated a drawing, but a figure, and is not signed and stamped by the registered professional engineer overseeing the installation efforts. Please provide this figure as a record drawing (see Comment 1b above) and clarify what is meant by “final grade” in Note 8 (i.e., top of DCF, top of SLF, etc.).
  - b. The seven “Squaw Gulch Valley Leach Field Closure Drain As-Built” borehole lithology and drain construction drawings should also be signed and stamped by the registered professional engineer overseeing the installation efforts. Please provide these “as-builts” as signed and stamped record drawings (see Comment 1b above).
  - c. Appendix Q.1, Summary of Closure Drain Concrete Test Results – Both specification 03300, section 3.06.D and IFC drawing A362 (Note 5) require a minimum 28 day compressive strength of 4,000 psi for the closure drain concrete collars. The cylinder test result for the closure drain concrete collars cited a 28-day strength of only 3,350 (or 84% of the minimum design strength). These collars stand to have a lot of material stockpiled on top of them and a compressive failure has the potential to collapse the closure drains that are critical to the reclamation/closure design. The Division cannot find any discussion on this deficiency in the QA Monitoring & Test Results Report. The Division requires some detailed discussion on this issue prior to granting any possible conditional or other approval.
    - i. Also comment on why air content was not tested per specification 03300, section 3.06.D
  - d. Appendix Q.5, Closure Drain As-built Drawings – Sheet No. 2 -2 limits of underdrain fill associated with the closure drains. Based on IFC Drawing A362 in Appendix Q.4, no underdrain fill is placed with respect to the closure drains. Please clarify what is meant by underdrain fill as it relates to IFC Drawing A362.

8. Appendix R, Underdrain Pond – There are discrepancies between test results summarized in Appendix R.1 and the individual concrete test reports in Appendix R.2 that call into question whether or not concrete used in the underdrain pond construction met specifications. Specification 03300, Section 2.02.B, requires 1) Placement slump between 2 inches and 5 inches, and 2) air entrainment of 5% to 8%. The slump and air content for all six mix batch samples summarized in App. R.1 are 3.75 inches and 7.5 %, respectively. However, the results presented in App. R.2 reports 2 through 6 do NOT match the summary table in App. R.1. Furthermore, according to the cylinder test reports in App. R.2, the slump did not meet the specification in Report Nos. 2 and 5; and air content specifications were not met in Report Nos. 2, 5 and 6. Please explain:
- The discrepancies between Appendices R.1 and R.2, and
  - Why concrete not meeting specifications was used for underdrain pond construction.

The Division may grant a conditional approval for certification reports. However, the Division cannot consider granting a conditional approval for the Squaw Gulch VLF Pregnant Solution Storage Area Project Final Report for Quality Assurance Monitoring & Test Results until Comment 7.c above is addressed to the Division's satisfaction. As such, the Division does not authorize the placement of any materials in the PSSA beyond that already documented as being placed in the subject report.

If you have any questions or need further information, please contact me at (303)866-3567 x8169.

Sincerely,



Timothy A. Cazier, P.E.  
Environmental Protection Specialist

ec: Tom Kaldenbach, DRMS  
Amy Eschberger, DRMS  
Elliott Russell, DRMS  
DRMS file