



September 23, 2022

Ms. Alyson Boye
Cripple Creek & Victor Gold Mining Company
P.O. Box 191
Victor, CO 80860

**Re: Cresson Project, Permit No. M-1980-244; Technical Revision (TR-131)
Preliminary Adequacy Review**

Dear Ms. Boye:

The Division of Reclamation, Mining and Safety (Division) has completed its preliminary adequacy review (PAR) of your Cresson Project 112d-3 Reclamation Permit Technical Revision (TR-131). The Division received the TR-131 on March 24, 2022. As the Division was reviewing TR-129 and TR-130 at the same time, CC&V requested we prioritize those two TRs over TR-131 and requested subsequent decision date extensions for TR-131. The current **decision date for TR-131** is **November 23, 2022**.

Please be advised that if you are unable to satisfactorily address any concerns identified in this review before the decision date, **it will be your responsibility to request an extension of the review period**. If there are outstanding issues that have not been adequately addressed prior to the end of the review period, and no extension has been requested, the Division will deny this application.

TR-131 is intended to address the Division's April 23, 2020 Preliminary Adequacy Review for AM-13, Volume III, Appendix 3 "Stormwater Management Plan (SWMP) and Valley Leach Facility (VLF)/Overburden Storage Area (OSA) Closure Stormwater Analysis Report".

The review consisted of comparing the technical revision content with specific requirements of the Hard Rock Act, 34-32-101 *et seq.*, C.R.S. (the Act) and the Minerals Rules and Regulations of the Colorado Mined Land Reclamation Board for Hard rock, Metal and Designated Mining Operations (Rules).

VLF/OSA CLOSURE STORMWATER ANALYSIS (dated October 19, 2021)

1. Section 2, Assumed Conditions. The second bullet states the OSA's will have a 12-foot wide bench. Details on Drawing 521 show all the OSA channels to be 21 feet wide at the top width (4 feet deep, including 1 foot of freeboard, with 2H:1V side slopes, plus a 5-foot



bottom width). Please explain how the proposed channel is feasible under the stated assumed condition.

2. Section 3, Stormwater Management. Near the bottom of the paragraph on p. 3 there is a statement indicating stormwater runoff for the two VLFs may increase or decrease depending on which closure cover alternative is chosen. The DRMS cannot evaluate a design based on unapproved cover alternatives. Please confirm the design presented reflects the currently approved VLF closure cover. (*Note: if an alternative closure cover is submitted and approved by the DRMS, a revision to the stormwater management design may be required*).
3. Section 3/Table 1/Appendix B. In addition to a summary of peak flows (hydrologic analyses), Table 1 also provides a limited summary of hydraulic design (channel bottom width and depth only). The paragraph following Table 1 states a detailed summary of the analyses can be found in Appendix B. Only hydrologic calculation summaries, analyses and results appear to be presented in Appendix B. This same paragraph goes on to state the “channel geometry was determined by HEC-RAS and Flowmaster”. The DRMS engineering staff is unaware channel geometries could be determined using either software, but rather thought the aforementioned software could only be used to evaluate the performance of various channel geometries entered by the user into the software. Appendix B does not appear to provide any hydraulic performance methodologies, assumptions, or calculations. Please provide calculation methods, assumptions and results for hydraulic performance evaluation of the proposed channels. This should be similar to the hydrologic calculations presented in Appendix B; and include: software used, rationale for selected Manning’s n values(*note: channels should be evaluated for both stability and capacity; i.e., both a maximum and minimum Manning’s n for the selected channel lining*), riprap sizing and grouted riprap design methodology, selected TRM performance criteria/specifications, flow velocity criteria, shear stress results (*especially important for the deep, narrow channels being proposed*), super elevation calculations related to freeboard for sharp bends, and software evaluation output or reports.
4. Section 3/Appendix C. The last paragraph in Section 3 states “plan and profiles of each channel are presented in Appendix C.” No plan and profiles for any of the proposed down drain or bench channels could be found in Appendix C. It is important to consider the profile in the design of the down drain channels as hydraulic performance can change rapidly when the slope changes on wide benches (such as those on the bottom three benches of VLF2); or at the tight transitions from bench channels to down drains (e.g., WHEX and ECOSA down drains). The figures included in the submittal are inadequate to determine bench channel flow directions as several appear to flow uphill (*e.g., some of the red arrows in watersheds WS4 and WS7 on Figure 6*). Plan/profile drawings would also aid in

understanding which bench channels contribute to which down drains. Please provide plan and profiles for all proposed down drain stormwater channels and plan views of bench channels (indicating flow directions at a minimum).

5. Channel Discharges to natural drainages (not pits). Discharges to natural drainages (Section 3.1 – Grassy Valley, Sections 3.4 and 3.5 – Squaw Gulch, Section 3.6 – Schist/Poverty Gulch) appear to all be incomplete. Figures and drawings show the engineered channels terminate well before reaching the designated natural channels. Furthermore, the design for the Squaw Gulch discharge is left open stating in Section 3.4 “This design does not include the required structures in order to convey this flow under Highway 67.” Where engineered channels terminate before reaching the intended natural drainage, substantial scour is bound to occur, contributing significant amount of sediment and rock debris to the natural drainages. Please provide updated designs to reach all the way to the designated natural drainages, including designs for conveying flows under Highway 67 to Squaw Gulch (*note: if this cannot be coordinated with CDOT, an alternative closure stormwater design may be required*). Design drawings (and figures) shall include and identify the current thalweg for these natural drainages in order to confirm proper termination.
6. Appendix B, Calculation sheets. There are two hydrologic analyses “NewFields Calculation Cover Sheets” in Appendix B, one prepared by JEP, while the preparer for the second is left blank. The two cover sheets appear nearly identical, while subsequent pages appear to present similar analyses, but with different results. For example, the first summary sheet for each package is for the Arequa Gulch VLF. The JEP sheet indicates Watershed AGVLF 1 is 0.0344 square miles, a length of 808 feet, a y of 40% and a t_p of 3.3 minutes; whereas the anonymous sheet for the same watershed indicates AGVLF 1 is 0.0218 square miles, a length of 440 feet, a y of 10.8% and a t_p of 3.9 minutes. There are no explanations for having two nearly identical calculation sheets, what the seemingly different purposes might be, nor any references to any figures or maps that might explain the significant differences in watershed areas/parameters for identically named areas. Furthermore, it is common engineering practice to include both the preparer’s and checker’s (reviewer’s) initials and the appropriate dates on engineering calculation sheets to demonstrate accepted practice for engineering design review was performed. Likewise, this practice is designed to demonstrate any analyses prepared by an engineer that has not obtained a professional engineering license, was supervised by a licensed professional engineer. Each of the facilities for which stormwater designs are presented in TR-131 are designated as environmental protection facilities (EPFs). Pursuant to Rules 3.1.5(3) and (5), 3.1.6(5), 6.3.3(2), 6.4.5(1) and (2)(c) and 7.3; it is required to demonstrate that appropriate details and designs were prepared by a qualified professional engineer. Please provide the following:
 - a. Calculation cover sheets with the initials and dates for both the preparer and checker,

- b. An explanation as to why two nearly identical calculation sheets with seemingly different parameters and results were provided, and
 - c. Figures or maps used for identifying watershed modeling input parameters
7. Appendix C, Drawings. The following design information was omitted from the design drawing package and must be provided to the DRMS for evaluation prior to approval of TR-131:
- a. Grouted boulder channel details including weep hole placement, depth of grout/height of exposed boulders and grout mix,
 - b. Riprap D50 and gradation specification(s) (*note: Drawing 530 lists 28 separate riprap D50 sizes*),
 - c. Equivalent TRM specifications for evaluation of shear force performance,
 - d. Typical details for bench channel transitions to down drain channels,
 - e. Typical details for down drain channel transitions to “collector toe” channels (i.e., the channels to which the down drains discharge flows),
 - f. Down drain plan & profiles (see Comment 4 above), and
 - g. Bench channel plan views, and profiles where slope differs from typical designs (see Comment 4 above).
8. Constructability. The DRMS has some questions with the proposed design regarding constructability. Please provide some narrative on the construction methods and equipment for the following:
- a. Several channels are proposed to be deep and narrow (i.e., depth > bottom width). How will deep, narrow channels (e.g., two and four foot bottom widths) be constructed on steep slopes?
 - b. Several very long grouted riprap channels are proposed, especially the down drains on steep slopes.
 - i. How will grout be delivered to sections midway between benches?
 - ii. What might be the impact of subgrade settling be on the stability/integrity of the down drains’ rigid channel lining?
9. TR-130 Commitment. Per CC&V’s June 14, 2022 TR-130 SAR response: “9) Channel/scour velocity: The response requires additional information and/or clarification. The DRMS accepts the commitment to maintain the channel during the operational life of the mine. How will the potential scour of these channels be addressed for post closure?: At closure the channels will be regraded and sloped along with the haul roads.” This channel

between VLF 1 and 2 along the existing haul does not appear to be addressed in TR-131.
Please provide closure design details for this channel as committed in TR-130.

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

Sincerely,

A handwritten signature in blue ink, appearing to read "Tim A. Cazier".

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

ec: Michael Cunningham, DRMS
Amy Eschberger, DRMS
Patick Lennberg, DRMS

Elliott Russell, DRMS
DRMS file
Katie Blake, CC&V