



COLORADO

Division of Reclamation,
Mining and Safety

Department of Natural Resources

1313 Sherman Street, Room 215
Denver, CO 80203

October 8, 2015

Mr. David Bieber
Front Range Aggregates, LLC
1161 S. Perry St., Ste.110
Castle Rock, CO 80104

**Re: Parkdale Project, Permit No. M-1997-054;
Technical Revision (TR-6) Second Adequacy Review**

Dear Mr. Bieber:

On September 30, 2015 the Division of Reclamation, Mining and Safety (Division) received your Clarification and Response to Comments for Technical Revision No. 6 prepared by Front Range Aggregates, LLC.

The current decision date for TR-6 is **October 15, 2015**. 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 technical revision.

The following comments are based on the Division's review of the aforementioned Clarification and Response to Comments for Technical Revision TR-06 received on September 30, 2015. Please note the original comment number sequence has been retained for tracking purposes.

1) Cover Letter, Last Paragraph: Regarding Rule 3.1.5(7):

- a. *The expected operating level of the water storage facility...* The "Reclamation Slope Design Schematic" indicates this range to be from empty to five feet below the top of slope. The response is adequate.
- b. *Engineering drawings, sections...* The "Reclamation Slope Design Schematic" provides an adequate response.
- c. **New comment:** Your Response to Comment 1 requests a variance to Rule 3.1.5(7) based on an acceptable factor of safety. The 3H:1V rule was not based solely on achieving a stable slope, but also factoring human and wildlife safety. The required



3H:1V slope is considered a minimum for safe egress for people or wildlife attempting to exit the water. To compound the safety issue, the “Reclamation Slope Design Schematic” indicates the slope will be covered with a geosynthetic liner. A wet geosynthetic liner would be expected to make safe egress difficult even at 3H:1V. Without some mitigation, the Division is inclined to deny your request for a waiver. Please call me to discuss mitigation options if you wish to pursue the 2H:1V geosynthetic lined pond option.

2) Applegate Group Memorandum – *The opening paragraph...*

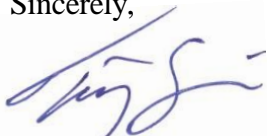
- a. *Drawings and analyses related to the groundwater drain...* The “Groundwater Drain Schematic Design Detail” provides a partially adequate response.
 - i. **New clarification comment:** The design notes on the “Groundwater Drain Schematic Design Detail” schematic indicate the 10-inch PVC pipe has a flow capacity of 580 gpm. No pipe slope or hydraulic gradient is specified and given the drain is in bedrock, some hydraulic justification for the specified positive drainage is required. Please provide a pipe slope or hydraulic gradient.
 - ii. **New clarification comment:** Both schematics show the groundwater drain constructed completely in bedrock at the toe of the un-excavated native alluvium slope and overlain by “Reclamation Slope Fill”. In addition, the Applegate Group slope stability diagrams show the phreatic surface following the contact between the native alluvium and the reclamation slope fill (implying a significantly lower hydraulic conductivity in the fill). The Division is led to the conclusion that there is no viable way for sufficient groundwater flow from the native alluvium to the drain through what is essentially a point contact (i.e., there is insufficient surface area to allow flow from the alluvium to the drain, especially when considering the unlikely constructability of cutting a four-foot deep trench at the exact limit of the toe of the slope). Please provide some additional discussion on how the system is expected to function, including what, if any flow is expected through the reclamation slope fill.
 - iii. **New clarification comment:** The design notes indicate the groundwater drain leads to a “central sump at the east end of the pit.”, presumably also in bedrock. Please provide some discussion as to how the sump is allowed to drain.
- b. *Clarification on the source(s) for each soil parameter...* The response is adequate.

c. *The section geometry based off a figure provided by David Bieber...* The response is adequate.

3) *Slope Stability Analyses*... The response is adequate.

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 'Timothy A. Cazier', is positioned above the printed name.

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

ec: Wally Erickson, DRMS
DRMS file