



April 14, 2020

Andre Laroche
Aggregate Industries - WCR, Inc.
1687 Cole Boulevard, Suite 300
Golden, CO 80401

**Re: Daniels Sand Pit 2, Permit No. M-1973-007-SG;
Technical Revision (TR-09) Second Adequacy Review**

Dear Mr. Laroche:

On April 10, 2020 the Division of Reclamation, Mining and Safety (DRMS) received your response to our November 11, 2019 Preliminary Technical Revision (PAR) application TR-9 for the Daniels Sand Pit 2 Permit No. M-1973-007-SG. The DRMS has completed its review of the response document.

The DRMS has received extension requests for the decision date. The current **decision date for TR-09 is April 30, 2020**. 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 may deny this Technical Revision.

The following comment numbers have been retained from the PAR for the purpose of tracking:

- 1) Figure 3, Cross Section #3: The response is adequate.

Appendix A

- 2) Factors of Safety Requiring Mitigation: The response is not adequate. Additional clarification is required. First, there are two sections in this response, but both are labeled "Fountain Mutual Ditch Above the Recharge Pond". Based on the narrative, the DRMS assumes the first section should be labeled "Fountain Mutual Ditch Above the New Wash Fines Pond". The narrative in the first section discusses the intent to buttress the slope with recycled concrete and stockpiled sand. Plate 1 indicates the base of the buttress will be recycled concrete overlain by Mirafi's woven 600x geotextile before placing potentially as much as 60 feet the sand fill on top of the geotextile. This configuration raises several questions:
 - a. The geotextile is a potential slip plain and is not modeled in the Slope/W stability analysis. Please add this layer in the model with appropriate friction values for the geotextile or provide justification for why the geotextile is not addressed.



- b. The Mirafi 600x product appears to be intended as a pavement underlayment. Their website states: “TenCate Mirafi® X-Series woven slit film polypropylene geotextiles provide separation for good subgrades by preventing mixing of subgrade soils and base aggregates.” In addition, the website suggests the use is intended for roadway/railway construction, roadway and railway stabilization and reinforcement, parking lots, residential streets, and roadways. Furthermore, the 600x specification states its maximum opening is 0.425 mm (No. 40 sieve) for which 77% of the sample passed in the laboratory gradation results provided for the “Bags-Stockpile”. It is not clear the intent of the geotextile, presumably it is to prevent the fine sands from migrating into the large voids expected in the recycled concrete fill, leading to prolonged settlement of the sand fill. If this is the purpose, the DRMS questions the use of this material. Please clarify the purpose of the geotextile and provide assurance:
- i. It is strong enough to withstand the sand fill load on top of it,
 - ii. It will retain the sand (if that is its purpose) given the maximum opening, and
 - iii. The angular recycled concrete will not puncture or increase the size of the woven opening from the load stress.

The second section labeled “Fountain Mutual Ditch Above the Recharge Pond” states “Construction will follow standard reclamation procedures and a specific mitigation plan is not needed.” Reclamation plans in both amendments 2 and 3 (approved in 2005 and 2008, respectively) assume the Fountain Mutual Ditch has been either removed or realigned. The reclamation contours indicate the 3H:1V slope is perpendicular to the axis of the ditch. As such an alternative mitigation plan appears to be in order.

- c. Please explain what reclamation plan approved by the DRMS will provide stabilization of the slope above the Recharge Pond.
- 3) Cross Section D-3 Cohesion: The response is not adequate. Additional clarification is required. The DRMS accepts the differentiation between effective stress and total stress, but that does not explain why effective stress was used for section D-3 and total stress for the other three sections. Furthermore, the argument implies the Factor of Safety would be lower for section D-2 if effective stress was used. Please provide a rationale explaining the different approaches and what the factor of safety would be for section D-2 if effective stress was used.
- 4) Strength Parameters: The response is adequate.

Appendix B

- 5) Lyman Henn 2006 Data: The response is adequate.

Additional Comments

- 6) Schedule. The schedule in the cover letter proposes extending the start schedule to spring of 2021 due to the Covid-19 situation. Perhaps the DRMS is too optimistic, but we’d like to see a schedule beginning around September 2020. If we approach that time frame and things have not improved, we would consider an additional extension at that time. Please provide a schedule for the construction effort.

- 7) Monitoring. The last paragraph in the cover letter states “we will perform frequent monitoring of the areas in question, and if signs of instability and/or movement are noted, we will implement emergency stabilization”. Please provide the DRMS with:
- a. The intended type(s) of monitoring,
 - b. The frequency for each type(s) of monitoring,
 - c. What level or sign of movement would trigger the emergency stabilization? And
 - d. What might be the emergency stabilization approach?

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: Michael Cunningham, DRMS
DRMS file
Andre Laroche, AI