



COLORADO

**Division of Reclamation,
Mining and Safety**

Department of Natural Resources

1313 Sherman Street, Room 215
Denver, CO 80203

January 10, 2019

Barb Brunk
Resource Conservation Partners, LLC.
P.O. Box 1522
Longmont, CO 80502

**RE: Tucson South Resource, M-2004-044, Amendment Number 1 (AM01)
Adequacy Review No. 1**

Dear Ms. Brunk,

The Colorado Division of Reclamation, Mining, and Safety (“DRMS” or “Division”), received the above referenced application on November 21, 2018. The application was deemed complete and filed for review on November 29, 2018. The Division is required to issue a decision on the application by February 27, 2019. The following adequacy review items will need to be addressed prior to the Division’s approval of the application:

Rule 6.4.3, Exhibit C – Pre-mining and Mining Plan Map(s) of Affected Lands

1. The contour lines in the south area and portions of the west area (east of the Brighton Ditch), are not sufficiently labeled to portray the direction and rate of slope in accordance with Rule 6.4.3(c). Please revise these maps accordingly.
2. There are no topsoil stockpiles shown in the Phase 3 (East Area) on the Exhibit C-5 map. Will topsoil be stored within the Phase 3 area? If so, please show the location of these piles on the Exhibit C-5 map.
3. Page D-5 indicates topsoil stockpiles within the floodplain will be created parallel to the South Platte River flows and will only be 300 feet in length with 100 foot spacing in-between the piles for flow. The topsoil stockpile depicted in the south area shown on the Exhibit C-4 map does not appear to comply with these requirements as a portion of it is within the 100 year floodplain and is perpendicular to the river flow. Either revise the map to configure the pile in accordance with the approved plan or provide an explanation why this pile is not configured as discussed in the narrative.

Rule 6.4.4, Exhibit D – Mining Plan

4. Page D-1 indicates the Applicant is working with the Landowner to obtain a right-of-way easement for a conveyor on Tract M. According to Exhibit N and Maps C-1, the Applicant owns Tract M. Please clarify and/or otherwise revise this discrepancy.



5. Page D-2 indicates the Todd Creek water well and associated United Power electric line on the west side of the West Area will be removed. Please clarify, are these structures A-5 and A-11 depicted on the Exhibit C-2 map? If so, does Todd Creek or the applicant own the water well to be removed? Also, please either provide documentation the Applicant has permission to remove the United Power electric line, and/or if this information has already been provided, please revise this page to indicate where in the application materials this documentation has been provided.
6. Please specify the depth(s) the topsoil will be stripped. Please revise page D-2 to indicate this information.
7. Page D-3 indicated Phase 1 (South area) will be mined wet and may also be actively dewatered. If this phase is planned to be wet-mined, please explain the purpose of dewatering?
8. Page D-5 discusses procedures to be followed for sloping within the regulatory floodplain. It is unclear if the applicant is proposing to maintain 3H:1V slopes within the floodplain during the flood season (April 1 through September 30), please clarify?
9. The Table on page D-6 describes when in the mining process the disturbance could be at it's maximum. The active mining area is shown to have a near vertical face of 800 feet and the highwall with adjacent cells walls will be 1,500 feet in length. However, page D-4 indicates the mining highwall may extend no more than 4,000 feet in length. Please explain the large difference in the highwall lengths discussed on page D-6 and D-4. At what point during the mining operation would the highwall reach 4,000 feet?

Rule 6.4.5, Exhibit F – Reclamation Plan

10. Condition number 1 of the Mined Land Reclamation Board's ("MLRB" or "Board") approval of the original application for the site required the Applicant to provide the Division a copy of the final version of the specifications of the slurry wall if they differed from the draft specifications approved. Page E-4 indicated the Applicant is working with another consultant on the final design of the slurry wall. Please commit to providing a Technical Revision to revise the slurry wall design and add language to Page E-4 of the reclamation plan for this commitment.
11. The temporary stockpile stabilization mixture shown on Page E-6 is different than the proposed mixture on Page D-5 of the Mining Plan. Please clarify this discrepancy and revise these pages so a consistent seed mixture is proposed for soil stockpile stabilization.
12. Page E-2 indicates cottonwood trees and shrubs will be planted along the eastern side of the east cell. For the cottonwood trees please indicate the number of trees to be planted and the type of nursery stock to be planted (bare root, containerized, tubling, etc.). Please specify the species of shrubs to be established and the type of nursery stock to be planted. Also, please provide

information on when and how trees and shrubs will be planted. Please revise the reclamation plan exhibit to include this information.

Rule 6.4.7, Exhibit G, Water Information

13. Page G-1 states, “runoff from disturbed areas, piles material and operating surfaces will likely be diverted to the settling pond for detention and cleansing.” Please revise this page to include a plan/discussion about how water from disturbed areas (including stockpile areas) will be diverted to settling ponds? Please update Maps C-4 and C-5 to depict run-off diversion structures.
14. Map C-4 does not show settling ponds in the Phase 2 (West Area). Run-off control for this area will need to be evaluated and addressed in the discussion and maps identified in the item above.
15. Similar to the adequacy item for the mining plan section about wet-mining the South Area and dewatering operations. Please clarify if any dewatering will occur at the South Area? If dewatering is planned for this Phase, an evaluation of the impacts of this activity and possible mitigation measures will need to be addressed in this Exhibit.
16. Page G-4, the Potential Mining Impacts section is confusing and hard to follow. Overall, the points made in this section are unclear. Please revise this section to clarify the statements made. The Division recommends addressing the impacts from dewatering and slurry wall installation (mounding and shadowing) by clearly indicating the possible impacts and their associated severity. If conclusions about the mining impacts are taken from the groundwater study please make this clear and cite specifically where within the report these conclusions are addressed.
17. Please submit the baseline water level data that has been collected to date.
18. The applicant indicates under the second bullet on page G-5 that if a subject well has not been put to beneficial use prior to mining, then they would have no responsibility to provide mitigation for groundwater impacts. Please remove this sentence as it is incorrect.
19. The monitoring wells shown on the Exhibit C-4 and C-5 Maps are difficult to locate and are at times covered up with the label of another feature. Please submit a separate map or figure that shows the location of the monitoring wells used in the monitoring plan.
20. Please update this discussion about the groundwater monitoring plan beginning on page G-5 to indicate the frequency the groundwater monitoring wells will be monitored.
21. The applicant indicated in the mining plan and shows on the Exhibit C maps that the majority of the site is located within the 100-year floodplain and portions of the East Area are located within the floodway. In the event of a significant flood event (100-year flood), it is likely the proposed mine site would be captured by the South Platte River. Where mining will occur within 400 feet

of the river channel, a flood analysis and flood control plan must be evaluated and submitted for Division review and acceptance. Please provide a flood analysis and flood control plan satisfying the requirements of the Urban Drainage and Flood Control District (“UDFCD”) for an expected 100-year flood event during the life of the operation and after final reclamation for the Tucson South Mine that includes and/or addresses the following:

- a. The flood analysis should quantify the velocity and volume of flows expected on site from a 100-year flood event, as well as the elevation of the 100-year base flood event and its relation to the elevation of any proposed spillways and embankments.
- b. The Applicant shall provide the flood elevations to be expected under a “worst case” flooding scenario and specific mitigation measures to be implemented to minimize the potential for any offsite impacts.
- c. Riverside berms are proposed in the amendment, which may be prone to erosion during a flood event. The potential for “berms” around gravel pits to be damaged during flooding is discussed in detail in the 2013 Urban Drainage and Flood Control District (UDFCD) Publication “Technical Review Guidelines for Gravel Mining & Water Storage Activities within or Adjacent to 100-year Floodplains.” Strips of native ground or constructed fill between the stream and the gravel pit, and generally aligned with the flow direction of the river are referred to in the UDFCD document as riverside berms. Engineered inflow and outflow structures are intended to mitigate possible slope failure during flood events for these berms. Please include a design for the protection of these berms.
- d. The flood control plan should address mitigation measures including pit side armoring, river side armoring, inflow and outflow channels, or other appropriate measures.

Rule 6.4.8, Exhibit H – Wildlife Information

22. Section 2.2.1.2 of the 2018 Biological Resources Inventory Report (“BRIR”), indicates Table 2 lists the season each species is expected to occur within the project area. The table does not include this information. Please revise this page to include this information.
23. Table 2 of the BRIR is titled “USFWS IPaC-Identified Migratory Birds likely to Occur in the Project Area.” This table also includes non-migratory bird species. Please revise this table so the title is reflective of the information contained in the table.
24. Please commit to notifying the Division if Burrowing Owls are identified during the pre-construction survey as discussed in Section 2.2.1.4.1 of the BRIR. Please add a section to the Exhibit H that specifically addresses this commitment.
25. Section 2.2.1.4.2 regarding Plains Minnow, Suckermouth Minnow and Brassy Minnow of the BRIR indicates impacts to the Brighton Ditch, Brantner Ditch and the unnamed tributary to the South Platte River will be avoided. The unnamed tributary to the South Platte River appears to be located within tracts F, G and H that are planned to be mined as part of the East Area (Phase 3)

operation. Given this, it does not appear this tributary will be avoided as stated in this section. Please address the following:

- a. Please revise this section of the BRIR report to indicate that possible monitoring and mitigation measures will need to be taken prior to disturbing the unnamed tributary to the South Platte River.
 - b. Please update Table 10 to indicate the fish species of concern will be monitored for and/or otherwise protected with the measures to be designed. As the un-named tributary is planned to be mined, this table incorrectly states this area will be avoided.
 - c. Prior to affecting this area, the Operator will need to conduct a survey to ascertain if species of Brassy Minnow, Plains Minnow and/or Suckermouth Minnow exist within the unnamed tributary. Please place a buffer zone around this tributary and commit to conducting a survey of the tributary prior to affecting land within the buffer zone.
 - d. Please update the Exhibit C-5 map to depict this buffer zone and add a section to Exhibit H that discusses the monitoring and potential mitigation measures that will be taken should these species be found during the pre-mining survey. The Division strongly encourages the Applicant to contact Colorado Parks and Wildlife when preparing the buffer zone, pre-mine survey and any potential mitigation measures.
26. Please commit to submitting the results of the nest surveys to be completed prior to the first year of construction during the winter months for the two potential raptor nests identified. Please add a section to Exhibit H that specifically addresses this commitment.

Rule 6.4.10, Exhibit J- Vegetation Information

27. Exhibit J consists only of the wetland delineation report. The majority of the information required by this exhibit is covered in the BRIR included in the Exhibit H. Please add a cover page to this exhibit directing readers to Exhibit H and the BRIR document for the information required by Exhibit J.
28. The Wetland delineation report identified at least three potential sites that may qualify as “Jurisdictional” in accordance with the United State Army Corps of Engineers (“USACE”) requirements. The report indicates the Applicant will likely need to obtain the proper permit from the USACE prior to affecting these features. Please address the following:
- a. Add a buffer zone around all the wetland features identified by the Applicant on the appropriate Exhibit C map(s). Please commit to not affecting this buffer zone area until approval from the USACE is granted. Please add language to the mining plan to reflect this requirement.
 - b. Please commit to submitting documentation to the Division prior to affecting lands designated as “Jurisdictional Wetlands” by the USACE.
 - c. Also please submit documentation that the wetlands the Applicant believes are not jurisdictional qualify for this designation.

Rule 6.4.12, Exhibit L – Reclamation Cost Estimate

29. The reclamation cost estimate submitted is based on the Applicant's projection of the maximum liability. It is discussed that this will occur at the end of mining in the East cell (Phase 3) area. The cost estimate assumes the Phase 1 area has been backfilled and the slurry wall has been installed around the Phase 2 and 3 area. It is very unlikely the point of maximum liability will occur at the time the applicant proposes. Case in point, the Division currently holds a bond for the site to cover the backfill and grading of the small 3 acre pit located in Tract M area on the north side of the East Area in the amount of \$326,040.00 for this disturbance. For the proposed first phase of the operation, the Applicant proposes to mine in the south area and affect 24.3 acres in this area, at this point the pit in the north part of the East Area is still a liability that also needs to be covered under the financial warranty. During the first phase of the operation, the Division would have to have sufficient bond to cover backfilling the exposed groundwater with a minimum of two feet of material above the water table. The Division would have to either excavate enough material on-site to do this activity without exposing additional groundwater or would have to purchase material to backfill the pit. Given this, please submit a cost estimate to complete reclamation assuming the South Area (Phase 1) has been mined and has not been reclaimed.

Rule 6.4.13, Exhibit M – Other Permits and Licenses

30. Based on a review of the Wetlands Delineation report submitted in Exhibit J, there are likely jurisdictional wetlands within the proposed affected land area. Given this, a Section 404 permit from the USACE will likely need to be obtained prior to affecting jurisdictional wetland areas. Please update Exhibit M to indicate the appropriate USACE Section 404 Permit will be obtained.

Rule 6.4.14, Exhibit N - Source of Legal Right to Enter

31. The Division could not locate the source of legal right to enter Tract F. Please provide a copy of this document.
32. Exhibit N contains a Special Warranty Deed documenting the City of Thornton owns Tract J, however it does not document the Applicant's source of legal right to enter and conduct operations within this tract. Please provide documentation of the applicant's legal right to enter Tract J in accordance with Rule 6.4.14.

Rule 6.4.19, Exhibit S – Permanent Man-made Structures

The Division has reviewed the Slope Stability Analysis by Tetra Tech dated November 8, 2018 included within Exhibit 6.5 – Geotechnical Stability Exhibit for the Tucson South Resource 112c permit

amendment application (AM-01). The Applicant will need to address the following adequacy items identified in the review:

The following list describes the information used by the Division as presented in the permit amendment application to evaluate slope stability for the proposed site:

- Geotechnical boring data is available for the site, but was not provided by the Applicant.
- The topsoil and overburden depth ranges from 1 to 10 feet with a typical depth of 3 feet.
- The aggregate depth ranges from 5 to 46 feet with a typical depth of 23 feet.
- The aggregate layer contains a 2 to 9 foot thick mud lens in parts of the site.
- The depth to bedrock ranges from 5 to 50 feet with an average depth of 27 feet.
- The stability analysis was limited to the East and West Lakes, since the South Cell will be backfilled to original grade.
- A slurry wall will be constructed around the East and West Lakes prior to excavating the areas to create a reservoir.
- A general 30 feet setback from the top of slope to the proposed permit boundary or man-made structures not owned by the Applicant will be maintained.
- The South cell mine walls will be mined at the or near the angle of repose, approximately 2H:1V.
- The East and West cell mine walls will be mined nearly vertical to a 0.5H:1V slope.
- Groundwater was encountered at depths between 8 and 12 feet below grade during the 2004 drilling program.
- Monitoring well readings from December 2003 to August 2004 indicated water levels between 4 and 16 feet below grade.
- The mining cells will be dewatered during aggregate extraction.
- The slurry wall will be keyed 6 feet into bedrock.
- Residual soil strength parameters were used for the upper 3 feet of weathered bedrock.
- A mud lens was modeled in each critical cross-section in a similar evaluation completed for the Tucson South mine in November 2004.
- A mud lens was not modeled in each cross-section in the 2018 Tetra Tech report.
- A 500 psf load was applied to Tucson Road and Hwy 7 cross-sections to simulate traffic.
- A 3,000 psf load was modeled to simulate the weight of the oil and gas well.
- The material properties used were the same as those required for the 2004 analysis based on a memo from Allen Sorenson dated August 29, 2004.
- Laboratory strength tests were not performed on the site soils.
- The groundwater elevation was modeled at the base of the pit on the pit side of the slurry wall.
- A horizontal acceleration of 0.067g was used for the seismic models.
- The minimum factor of safety for static analysis is 1.5
- The minimum factor of safety for seismic analysis is 1.3

The following information is required by the Division to continue the stability analysis review.

33. On Page D-4 of the Mining Plan, the Applicant states the perimeter setbacks from the permit boundary are shown on Exhibit C – Mining Map. Please update the Exhibit C Maps to indicate the numerical offset distance for the perimeter setbacks from the permit boundary.
34. In Section 2.0 Geology of the Tetra Tech report, the Applicant states 130 boreholes have been drilled on the site. Please provide the geotechnical borehole data and location map for Division review.
35. On Page 3 of the Tetra Tech report, the Applicant states the water table was assumed at 15.5 feet below grade on the south side of the slurry wall. The Division anticipates the groundwater elevation would be elevated due to mounding effects on the south side of the slurry wall. Please provide justification for the modeled groundwater depth for the Highway 7 cross-section.
36. On Page 3 of the Tetra Tech report, the Applicant references a report titled “Material Quantities at Proposed Tucson South Resource dated May 25, 2004 by C. Goss”. Please provide a copy of the report for Division review.
37. In Section 4.3 Model Results of the Tetra Tech report, the Applicant indicates the required setback at 75 feet from Tucson Street. Please clarify is the offset is from the current to future right-of-way easement. Please label the offset distance on the Exhibit C maps.
38. In Section 4.3 Model Results of the Tetra Tech report, the Applicant indicates the required setback at 110 feet from the water pipeline. The Exhibit C-6 map, Details A and B indicates a 43 feet offset from the pipeline easement. Please explain this discrepancy and update the Exhibit C-6 map details accordingly.
39. Please update the Exhibit C maps to indicate the required setbacks based on the stability analysis results as indicated in Section 4.3 Model Results of the Tetra Tech report.
40. Please provide justification for not modeling the mud lens in all of the 2018 cross-section as was modeled in the 2004 stability analysis for the site.
41. Please provide the SLOPE/W data performed by Tetra Tech to allow the Division to duplicate the analysis with Clover Technology’s Galena software for verification purposes.

The Division will verify the Applicant’s stability analysis models using Clover Technology’s Galena v7.1 slope stability software following the Applicant’s response to this letter.

Rule 1.6.2(1)(d) and (e), Notification Requirements

42. In accordance with Rule 1.6.2(1)(e), the Applicant shall serve a copy of the notice required by Rule 1.6.2(1)(d) immediately after the first publication to the Owners of Record of all land

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surface within 200 feet of the boundary of the affected land. The Division could not locate documentation the required notice was served to Kathleen Bloom a property owner that appears to be within 200 feet of the affected land of the South Area. Please provide documentation this party was served the required notice immediately after the first publication.

Comments

43. The Division has forwarded you comments received from the following agencies: Division of Water Resources (dated December 12, 2018), Office of Archaeology and Historic Preservation (dated December 7, 2018) and the USACE (dated December 31, 2018). Please review these comments and address any concerns identified.

Mined Land Reclamation Board Conditions of Approval

44. The Colorado Mined Land Reclamation Board ("Board") conditionally approved the original permit application for the permit number M-2004-044 for the Tucson South Resource site with five conditions. Please review and address each of the five conditions of approval. Please specifically explain how these conditions are addressed with this Amendment application. If the Applicant believes a condition is no longer applicable please explain in detail the basis for that assumption.

This concludes the Division's preliminary review of the AM01 application. The Division is required to issue a decision on the application by February 27, 2019. The adequacy issue listed above must be addressed to the Division's satisfaction prior to the decision date. If you need additional time to address these issues you must request an extension of the decision date. Please be aware that that the Division will deny the application if outstanding adequacy issues remain when the decision date arrives or inadequate time is provided for the Division to review the response to the adequacy items.

If you have any questions feel free to contact me at (303) 866-3567, extension 8120.

Sincerely,



Jared Ebert
Environmental Protection Specialist III

EC: Joel Bolduc, joel.bolduc@aggregate-us.com