May 8, 2024

Colorado Division of Reclamation and Mining Safety
Mr. Rob Zuber
1313 Sherman Street, Room 215
Denver, CO 80203

RE: Technical Revision 1 – Monarch DENM Mine (Permit M-2022-009), Weld County, Colorado

Dear Mr. Zuber:

The following letter presents Monarch Mountain Minerals and Aggregates, LLC's (MMMA) responses to TR-01 first adequacy review letter dated April 11, 2024. The Division's adequacy comments are presented below in *italics* and MMMA's responses are in **bold**.

1. Please provide a copy of the approved Substitute Water Supply Plan that allows for exposing groundwater at the site.

- **DWR has confirmed that the replacement values are good with the DWR and the signed lease has been submitted, we are currently waiting to receive the final approval. We will provide a copy to the Division once we receive it.**

2. Please update the piezometer location map to include the major permit structures, current and proposed, e.g. slurry walls, freshwater and siltation ponds, and processing area.

- **The piezometer location map included with the Groundwater Monitoring Plan has been updated to include the major permit structures.**

3. The Operator proposes to collect groundwater samples from three locations, two downgradient and one upgradient. The Operator will need to expand sampling locations to demonstrate that existing and reasonably potential future uses of groundwater are protected (Rule 3.1.7(8)) and no unauthorized release of pollutants to groundwater shall occur from any materials mined, handled or disposed of within the permit area (Rule 3.1.5(11)). Please note PZ-1 is not part of the current monitoring network and is located in the area where the processing plant is to be located. The plant area is identified in Section 4 as the highest risk of potential contamination to groundwater.

- **Section 4 lists the plant and the siltation pond as the location of the highest risk of potential contamination to groundwater. PZ-04 was selected for water quality analysis because it is at the permit boundary and downgradient of most of the Site including the unlined ponds where the most amount of interaction with the groundwater table will occur. The gradient over most of the Site is to the northwest, including from the unlined ponds and wash plant. PZ-04 is best situated to measure potential contaminants leaving the Site.**

  PZ-01 is located adjacent to the Highway 60 borrow ditch which is also utilized as a return ditch from flood irrigation at the properties east of Highway 60. In order to obtain baseline data along the northeastern edge of the Site PZ-01 has been added to the five (5) quarters of baseline data but since there are multiple sources of offsite contamination PZ-01 is proposed to be excluded from the points of compliance. PZ-01 will be monitored quarterly starting in Q2 of 2024 and ending in Q3 of 2025, one quarter after the baseline monitoring of the other wells has completed.

4. Please update Table 1 with the following for each piezometer: top of casing elevation, ground surface elevation, depth to groundwater from top of casing, and distance from ground surface to groundwater.

- **Table 1 has been updated to include the information requested and added as an attachment to the report.**

5. Groundwater levels are to be collected monthly at the Site. The application was approved in July 2022 but was not issued until June 2023. During that time monthly measurements were not completed in October 2022 and February 2023. Additional monthly measurements were not completed in July and August 2023. Please provide an updated Table 1 with groundwater level measurements though March 2024 and update the associated graphs as needed.

- **The additional groundwater measurements have been included.**

Groundwater Analysis Plan
6. Please provide another graph that depicts depth to groundwater from the ground surface.

- **Depth to groundwater from the ground surface has been included in the plan**.

7. In Section 3.0 it is stated, "The model demonstrated that upgradient of the Site, the groundwater table is expected to rise up to 5.7 feet above the baseline level of the model, without any mitigation. Depth to groundwater in this area after construction of the slurry walls ranges from 18.4 to 20.5 feet below ground." Please update this section to clearly state what the expected rise in groundwater level will be with the installed mitigation measures, and what the resulting rise will be relative to ground surface and other structures in the area such as basements (if any). Please clarify the predicted depth to groundwater after slurry wall and mitigation measures will be installed.

- **At total buildout of the Site with the proposed mitigation structures installed, the model demonstrated that upgradient of the Site, the groundwater table is expected to rise 1.3 feet at PZ-20, east of Cell 2. Based upon the latest groundwater monitoring data at PZ-20 the minimum depth to groundwater observed since February 2022 was 13.8 feet below the ground elevation. With a 1.3 rise that would have the groundwater elevation at approximately 12.5 feet below the ground surface at PZ-20.**

  There are five (5) houses located in the PZ-20 area east of Cell 2 and Cell 1. According to the Weld County Assessor's website all five (5) of these houses have basements. Ground surface elevations used to determine depth below ground at the houses was taken from Google Earth. Section 3.0 has been updated to add the requested information and to add clarity.

8. Pursuant to Rule 3.1.7(7)(b)(iv), please provide a description of the quality control and quality assurance methods (e.g., duplicate samples, rinsate samples) to be used during quarterly sampling.

- **Duplicate samples will be taken for all sampling going forward and has been added to Section 5.1.**

9. Please commit to providing the quarterly groundwater monitoring results along with the monthly level measurements by the following deadlines:
• First quarter report due by May 1st of every year.
• Second quarter report due by August 1st of every year.
• Third quarter report due by November 1st of every year.
• Fourth quarter report due by February 1st of the following year.
At the end of five quarters the Operator may submit a Technical Revision to reduce the analyte list and frequency of monitoring with sufficient justification.

- **Five quarters of baseline quality monitoring is consistent with recently permitted sites in the area such as Ragsdale Reservoirs (M-2020-007) and the Windsor East (M-2022-042) and exceeds the requirements of slightly older permits. Any stormwater discharges will be made under an NPDES discharge permit from CDPHE and the Site will operate under a Stormwater Management Plan. The plant will be designed with stormwater BMPs to reduce the risk of impacts to water quality from surface discharge and will have a spill prevention, control and countermeasure (SPCC) plan in effect to address any potential spills.**

  While MMMA agrees that five (5) quarters of baseline sampling will be beneficial in creating a record of current groundwater conditions, they contend that there is not a "reasonable potential" for the Site to adversely affect the groundwater quality of the area. As such, we believe that the current sampling schedule of five (5) quarters and at release of the reclamation permit is consistent with other Sites and will adequately characterize pre and post-mining water quality. For these reasons, MMMA does not agree to continuing quarterly sampling after the five (5) quarters of baseline sampling.

10. Please commit to providing the Division a written report within five (5) working days when there is evidence of groundwater discharges exceeding applicable groundwater standards or permit conditions imposed to protect groundwater quality, in accordance with Rule 3.1.7(9). Please be advised, this notice requirement would apply to any exceedance of the groundwater monitoring standards set for monitoring wells. However, enforcement actions would only be pursued for exceedances at the approved point of compliance well (or wells).

- **This stipulation has been added to Section 5.3 of the Plan.**

11. Please commit to establishing a point(s) of compliance following five (5) quarters of baseline monitoring in accordance with Rule 3.1.7(6).

- **MMMA commits to establishing a point of compliance well at PZ-04 which is downgradient of most of the Site and less likely to be contaminated by offsite influences.**

12. In Section 5.2 the full list of analytes referenced to be in Appendix B is missing. Please provide the missing Appendix B.

- ***Appendix B has been attached.***

13. Please update Table 1 – Groundwater Baseline Data to clearly indicate which analytes are to be reported as Total and which are to be reported as Dissolved.

- ***The Groundwater Baseline Data Table has been updated, and the title has been updated to Table 2 – Groundwater Baseline Data.***

14. The mitigation triggers for groundwater level is specific to two piezometers PZ-20 and 27. The Division requests trigger levels be set for all piezometers at the Site. Please propose trigger levels for all locations at the Site and include a discussion of the proposed rise relative to ground surface and other structures in the area such as basements (if any).

- ***The trigger points were set at the two upgradient piezometers because they were identified as areas of concern during the modeling process. Mounding south of the Site after construction of the Cell 3 slurry wall was demonstrated to raise groundwater levels approximately 5.8' at PZ-20 which has the potential to affect structures in the regions which are specified in the Groundwater Model Report. Trigger points were not considered for the downgradient piezometers due to the lack of structures that would be affected between the Site and the South Platte River and the property owner owns the parcels between the slurry walls and the river.***

As indicated in the Groundwater Monitoring Plan, there is one well not owned by HS Land and Cattle downgradient of the Site. 187425—A is located to the northeast of Cell 2 and was completed to a depth of 55 feet. The well is located on the bench above the South Platte River floodway and is approximately 450' from ponded water from the unnamed slough. Due to the proximity of the well to a waterway and the saturated aquifer thickness of approximately 35 feet, it is unlikely that the shadow affect from the lined cells will be detrimental to this well.

A trigger point of 3 feet of rise from the maximum pre-mining background has been set for PZ-25 in addition to the previous piezometers listed (PZ-20 and PZ-27). There are no below grade structures that will be affected by mounding within approximately 3,500' of PZ-09, the closest basement being the Greybill residence at 12774 WCR 42 which will be covered by PZ-25 and PZ-20. No mitigation triggers were set for PZ-01, PZ-04, and PZ-15(all downgradient) or for PZ-09 for the reasons listed above.

15. Please note that DRMS will review any report submitted within 30 days of a complaint being received and will determine whether or not the mining activities are responsible for the impacts in the complaint.

- **Noted.**

Goundwater Model Review

16. In Section 6.2, page 9, in the last sentence of the first paragraph, the depth to groundwater needs to be clarified and updated to be consistent with what is in Table 3 at the top of the page.

- **The table is correct, the text has been updated to 16.8 feet below ground level which is reflected in the table.**

17. In Section 7 – Conclusion, the third bullet states that the report is based on six months of piezometer data. Now that 20 level measurements, and more if data through March 2024 is included, have been taken at the site, how do those measurements impact the model and its findings?

- **The piezometer data was used to calibrate the model to observed groundwater elevations in the Spring of 2022. The year over year difference between the calibration period in spring 2022 and the same period in 2023 is on the order of one foot lower to 1.4 feet higher than the calibration period. Excluding one measurement at PZ-15 taken on June 30, 2023 which showed a ten (10) foot rise year over year. This reading is likely a data entry error because the groundwater difference was less than one (1) year over year for the preceding and subsequent measurements.**

  The change on the order of one (1) to two (2) feet year over year does not impact the model and it's findings and is to be expected due to natural variability. The depth to groundwater upgradient of the Site remains relatively deep and a rise less than three (3) feet is unlikely to affect upgradient structures. An underdrain mitigation structure south of Cell 3 remains an effective way to mitigate against the modeled rise in groundwater elevation due to the installation of the slurry walls.

We appreciate your review. Should you have any questions, please contact us.

Sincerely,
CIVIL RESOURCES, LLC.

Kyle S. Regan, P.G.

Cc: Eric Leigh

Attachments:
Groundwater Monitoring and Analysis Plan
Gilcrest Area Alluvial Groundwater Model
Q12024 Water Quality Analysis Results

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