COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

October 31, 2022

Julie Mikulas
Martin Marietta Materials, Inc.
1800 N. Taft Hill Road
Fort Collins, CO 80521

Re: Martin Marietta Materials, Inc., Windsor East Mine, File No. M-2022-042, Exhibit G - Water Information Review Memo

Ms. Mikulas,

The Division of Reclamation, Mining and Safety (Division/DRMS) reviewed the contents of Exhibit G - Water Information for the Windsor East Mine permit application, File No. M-2022-042. A copy of the review memo from Eric Scott dated October 14, 2022 is attached for review.

If you have any questions, please contact me at peter.hays@state.co.us or (303) 866-3567 Ext. 8124.

Sincerely,

Peter S. Hays
Environmental Protection Specialist

Enclosure – Review Memo

Ec: Jared Ebert; Division of Reclamation, Mining & Safety

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Division of Reclamation, Mining and Safety
Department of Natural Resources

To: Peter Hays
From: Eric Scott
Date: October 14, 2022
Re: **Summary of Adequacy Questions/Issues for Windsor East (M2022-042) Exhibit G Review**

1) What will cells B and D be backfilled with and how? The narrative implies that these areas will be as permeable as native materials and pose no impediment to GW flow when mining is completed, however if they are backfilled with wash fines, or the backfill is compacted during placement, it is much more likely that they will create a similar barrier to GW flow as the lined cells along with the same potential impacts due to mounding/shadowing.

2) There seems to be a great deal of uncertainty about the location of well 1472-R-R, up to and including what side of the river it is on. The location of this well should be field verified so that it can be accurately shown on the provided maps, and potential impacts be more accurately determined.

3) All of the baseline GW level, flow direction data, and estimated flow mapping presented in this exhibit is derived from WL data collected from the adjacent Parsons site. However, it is stated that the measuring point elevations for the Parsons wells were "estimated from topo maps". Basing this kind of data presentation on "estimated" elevations from topo maps is not consistent with industry standards or the TSOP presented in the provided exhibit. For DRMS to be able to consider water level data from the Parsons site in this review, all measuring points should be surveyed to 0.01' (and tied to the same reference elevations as the WEM wells), the historic readings recalculated, and the associated tables and figures re-created as needed.

    a. It appears that the 5 new WEM wells have been properly surveyed as the elevations are given to 0.01', however this should be confirmed.
    b. All subsequent WL readings collected at the WEM and Parsons sites should be recorded to the nearest 0.01', not just the nearest tenth of a foot as shown in the provided materials. This would also be consistent with the provided TSOP.

4) Section 1.6 of the provided materials describes a "simplified model" and states that it was calibrated/verified based on observed drawdown in one well. This model is then used to predict groundwater drawdowns due to mining after one year and 5 years of dewatering at distances up to 2640 feet. DRMS will require a substantially more rigorous modelling demonstration to predict and illustrate the maximum groundwater drawdown impacts from dewatering during mining, potential impacts to nearby wells, as well as any post-mining mounding and shadowing impacts due to the construction of impermeable or low permeability mine cells. The model should provide GW drawdown/mounding contour maps based on, and verified against all available site setting and geologic information, current and historic water level data, and the predicted size and location of mining cells (for both sites).

5) Section 2.1 of the provided exhibit states that up to 5 quarters of "baseline" GW level data will be collected for the WEM site with the exception of Cell A where dewatering will commence immediately. This is based on the rationale that GW levels in that area have already been

impacted by the adjacent Parsons dewatering activity. DRMS acknowledges that the historic GW regime has likely already been impacted to some extent by the adjacent Parsons site. However, based on the observations of significant GW drawdowns at distance from the Parsons site, allowing dewatering of Cell A while attempting to collect "baseline" water level data for the remainder of the WEM site will likely render that data useless as a "baseline" for later mining drawdown comparison. Dewatering or exposure of GW should not be allowed on the WEM site until the full 5 quarters of baseline data can be collected.

a. Mining below groundwater/dewatering of Cell A during collection of the 5 quarters of baseline data may also adversely impact the validity of the baseline analytical data results.

6) Water Quality Parameters and rationale presented in section 2.2.1 and Table 5 are acceptable as presented with the following edits.
   a. Add CN to section 2.2.1 or sample for it..
   b. WQS for U should be 0.0168 to 0.03, not 0.02 as stated in Table 5
   c. Will any QA/QC samples be collected/run to verify field and lab procedures?
   d. I note that although there are several wells on the adjacent Parsons site, no analytical data has been presented as "background" for WEM, however, that may be a subject for another discussion.

7) Section 2.2 (as well as 2.2.2) states that "regular data collection" from the 5 new GW wells will take place, but does not specify what that means. I would suggest that WL data be collected at least monthly and analytical sampling be conducted quarterly (as stated) until the 5 quarters of baseline data have been obtained. Analytical sampling intervals after the initial 5 quarters are acceptable as presented.

8) All baseline data as well as any proposed modifications to the analyte list or sampling intervals should be submitted to DRMS as a TR for review and approval.

9) Section 2.3 states that "in the event of a well owner compliant within 600' of the affected area" MM will submit a report to DRMS within 30 days. DRMS does not restrict the radius of impact to 600' and therefore will require MM to commit to reporting any complaints by well owners to DRMS within 48 hrs or less. MM will be required to initiate an investigation into the complaint immediately, and submit the results to DRMS for evaluation within 30 days.

10) Section 2.3 also states that "if a well goes dry, MM will implement mitigation measures within 7 days." In the event that a well owner reports that their well has become unusable, MM will be required to implement mitigation measures immediately (as soon as practically possible). MM will concurrently commence an investigation into the status of the complaint. The results of this investigation as well as any proposed remediation or rationale for discontinuing mitigation will be submitted to DRMS for approval within 30 days.

11) Appendix G-3: Because the analyte list and reporting levels have been identified, please identify and include the sample container type and size, preservative (if required), holding times, and analytical method to be used. This information could also be included in Table 5.

12) Field forms or logbooks should be used to record GW well purging and field sampling data consistent with industry standards.