November 14, 2023

Mr. Phillip Courtney
Land Manager West Division
1627 Cole Boulevard, Suite 200
Lakewood, CO 80401

RE: Martin Marietta, Rich Gravel Mine, Pueblo County, Colorado – Mitigation Plan for Potential Groundwater Impacts

Dear Mr. Courtney:

The purpose of this memo is to describe the existing groundwater regime in the vicinity of the Rich Gravel Mine ("Site") and potential groundwater impacts that could result from mining and reclamation of a new mine cell at the site. The site is located in the Arkansas River Valley, east of Pueblo, Colorado, on the south side of U.S. Highway 50 in Pueblo County.

More specifically, the site is within parts of Sections 33 and 34, Township 20 South, Range 63 West and in parts of Sections 2 and 3, Township 21 South, Range 63 West of the 6th Principal Meridian.

Executive Summary

In summary, there are no pumped wells within 600 feet of the permit boundary that are likely to be impacted by mining and reclamation in the Phase I mining area. Two inactive stock wells on Martin Marietta property between 600 feet and one-half mile could be impacted. These two wells are located on Martin Marietta's adjacent property operated pursuant to Mine Permit M-2008-001 and will likely be removed in the future. The review found 15 wells mapped within 600 feet of the permit boundary and 27 wells between 600 feet and one-half mile of the permit boundary.

Existing Groundwater and Subsurface Conditions

The near surface groundwater is part of the alluvial aquifer along the Arkansas River in which permeable sand and gravel alluvium overlies relatively impermeable bedrock of the Lower Member of the Pierre Shale (Tweto, 1979). Exploratory borings drilled at the Rich Pit site encountered the following geologic units:

Overburden

Overburden was encountered in all of the borings. Overburden thicknesses range from approximately five (5) to seventeen (17) feet averaging approximately ten (10) feet. The overburden is described as ranging from silty sand to silty clay.

Sand & Gravel

The sand and gravel unit was encountered in all of the borings underlying the overburden and overlying the bedrock. This unit thicknesses ranges from approximately fourteen (14) to thirty-one (31) feet averaging approximately twenty-three (23) feet. This unit includes local clay lenses.

Bedrock

Shale bedrock was encountered in all of the borings at depths ranging from approximately twenty-seven (27) to thirty-nine and a half (39.5) feet.

Groundwater
Groundwater was encountered in all of the borings at depths ranging from approximately seven (7) to sixteen (16) feet.

The mine cells at the Rich Pit site are located on the north side of the Arkansas River where the prevailing groundwater flow direction is anticipated to be south-southeasterly roughly reflecting the site topography with some influence from the bedrock topography. Groundwater in the area is tributary to the Arkansas River located on the south part of the site. Local groundwater levels and flow directions are likely influenced by:

- The Arkansas River is located on the south part of the site. For the majority of the year, the river acts like a drainage way maintaining groundwater elevations higher than water elevations in the river. During periods of high runoff, usually in the spring, river water levels will locally recharge the alluvial aquifer.

- The Excelsior Ditch traverses the northern part of the site before leaving the north part of the site. The ditch will act like a drain during the non-irrigation season maintaining surrounding groundwater levels at or near water levels in the ditch. During the irrigation season, the ditch may serve as a source of recharge to the alluvial aquifer.

- Current dewatering at the active mine area (Figure C2) of the Rich Pit.

- Dewatering at the neighboring Stonewall Springs Quarry located to the east of the Rich Pit.

- Irrigation is practiced in the area. Applied irrigation that is not lost to evaporation and transpiration will likely recharge the alluvial aquifer.

- Minor losses to the groundwater regime will occur due to evaporation of existing mined gravel lakes locate in the plant area and the south part of the mine. Evapotranspiration will also result in minor losses to the groundwater regime.

- Alluvial Wells: Local alluvial wells are present in the area. When pumping, groundwater will be drawn to the well(s).

Mining Plan
All mining will occur north of the Arkansas River as indicated on Figure C2. The Arkansas River forms a hydraulic boundary. The mining and reclamation will not affect groundwater flows on the south side of the Arkansas River because the river forms a hydraulic barrier.

One (1) new mine cell is currently planned at the site. Dewatering at the mine cell commenced in April 2021 and continues today. The dewatering will lower groundwater levels in the area. To date Martin Marietta has not received complaints from any neighboring well owners.

Reclamation Plan

Current plans are to backfill the mined area with overburden to an elevation two (2) feet above the existing seasonal high-water table as indicated on Figure F2. The overburden will be less permeable than the mined sand and gravel. Thus, slight mounding (higher groundwater) is anticipated on the upgradient areas (north and west) of the mined area and slight shadowing (lower groundwater) is anticipated on the downgradient areas (south and east) of the mined area.

Any mounding effect on the upgradient side is anticipated to be relatively minor (on the order of a few feet or less) and will dissipate with distance from the mine. The shadowing affect will likely be minor on the order of less than a foot to a few feet and will also dissipate with distance from the reclaimed cells.

Area Wells Within Approximately 600 Feet of the Mine Permit Area

A review of mapped, permitted wells on file at the State Engineer's Office (SEO), Division of Water Resources (DWR) indicates there are fifteen (15) permitted wells mapped within approximately 600 feet of the permit boundary (Figure 1). All of these wells are or were screened in the alluvium. Nine (9) of these wells are west and north (upgradient) of the mined area (Figure C2). Four (4) of the wells are east of the mine (downgradient) of the mined area (Figure C2). Two (2) of the wells are on the south side of the river and are not discussed below as water levels at these wells will not be affected because the river forms and hydrologic boundary. In addition, several wells are within the permit area and are owned by the Martin Marietta.

Below is a discussion of off-site wells located within 600 feet of the permit boundary:

Monitoring Wells:

The following group of monitoring wells are within 600 feet of the permit boundary, but because they are not pumped, these well users are not impacted by dewatering of the Rich Pit mine area.

- Colorado Department of Agriculture (262268): This well is a monitoring well mapped to the east approximately 140 feet from the permit boundary and approximately 760 feet downgradient of the active Rich Pit mine area. This well is 29.5 feet deep with a groundwater level at 14.4 feet. This well is not pumped. Groundwater levels in this monitoring well may be affected by dewatering at the neighboring Stonewall Springs Quarry. There may be an additive effect due to dewatering during mining of the Rich Pit mine area. The additive effect will likely disappear after reclamation at the Rich Pit.

- Silman (279124): This well is a monitoring well mapped to the east approximately 110 feet from the permit boundary and approximately 1,500 feet downgradient of the active Rich Pit mine area. This well is 32 feet deep with a groundwater level at 11.4 feet. This well is not pumped. Groundwater levels in this monitoring well may be affected by dewatering at the neighboring Stonewall Springs Quarry. There may be a slight additive effect due to dewatering during mining of the Rich Pit mine area. The additive effect will likely disappear after reclamation at the Rich Pit.

- Fremont Paving and Redi-Mix (309763): This well is a monitoring well mapped to the east approximately 500 feet from the permit boundary and approximately 1,880 feet downgradient of the active Rich Pit mine area. This well is 31 feet deep with a groundwater level at 15 feet and is mapped adjacent to the Stonewall Springs Quarry. This well is not pumped. Groundwater levels in this monitoring well are likely affected by dewatering at the neighboring Stonewall Springs Quarry.

There may be a slight additive effect due to dewatering during mining of the Rich Pit mine area. The additive effect will likely disappear after reclamation at the Rich Pit.

Gravel Pit Wells

- Stonewall Springs Quarry (82714-F): This well is a gravel pit well mapped to the east approximately 450 feet from the permit boundary and approximately 2,100 feet downgradient from the active Rich Pit mine area. This pit is approximately 32 feet deep. This mine is likely dewatered. Any effects during dewatering at the Rich Pit may not be noticeable and may be considered mutually beneficial if noted. Water levels will likely be near normal after reclamation at the Rich Pit.

Wells likely not impacted due to distance from the mining area:
Due to distance from the mining area, the following wells are unlikely to be impacted due to dewatering for the Rich Pit Mine area.

- Mehring (3934): This well is a domestic well mapped to the west approximately 600 feet from the permit boundary and approximately 3,050 feet upgradient of the active Rich Pit mine area. This well was drilled in 1959 and is 40 feet deep with a groundwater level at 10.5 feet and a capacity of 10 gallons per minute (gpm). Due to the distance, groundwater levels and well capacities are unlikely to fall due to dewatering at the active Rich Pit mine area.

- Mehring (4941-F): This well is an irrigation well mapped to the west approximately 600 feet upgradient from the permit boundary and approximately 3,100 feet from the Rich Pit mine area. This well was drilled in 1963 and is 32 feet deep with a groundwater level at 7 feet and a capacity of 850 gallons per minute (gpm). Due to the distance, groundwater levels and well capacities are unlikely to fall due to dewatering at the active Rich Pit mine area.

- Levar (164222): This well is a domestic well mapped to the west approximately 280 feet west of the permit boundary and approximately 6,000 feet northwest and upgradient of the active Rich Pit mine area. This well was drilled in 1973 and is 45 feet deep with a groundwater level at 18 feet and a capacity of 15 gallons per minute (gpm). Due to the distance, groundwater levels and well capacities are unlikely to fall due to dewatering at the active Rich Pit mine area.

- AB CIG NO 2 (1409024): This well is mapped on the north side of Highway 50 approximately 440 feet from the permit boundary and approximately 5,400 feet northwest and upgradient of the active Rich Pit mine area. A well field inventory form indicates this well is inactive and was to be abandoned in 1995 but was not. Due to the distance, groundwater levels and well capacities are unlikely to fall due to dewatering at the active Rich Pit mine area.

- AB CIG NO 4 (1409025): This well is mapped on the north side of Highway 50 approximately 440 feet from the permit boundary and approximately 5,400 feet northwest and upgradient of the active Rich Pit mine area. A well field inventory form indicates this well is inactive and was to be abandoned in 1995 but was not. Due to the distance, groundwater levels and well capacities are unlikely to fall due to dewatering at the active Rich Pit mine area.

- AB CIG NO 6 (1409026): This well is mapped on the north side of Highway 50 approximately 400 feet from the permit boundary and approximately 5,400 feet northwest and upgradient of the active

Rich Pit mine area. A well field inventory form indicates this well is inactive and was to be abandoned in 1995 but was not. Due to the distance, groundwater levels and well capacities are unlikely to fall due to dewatering at the active Rich Pit mine area.

- Martin Marietta Materials (10554-R): This Martin Marietta well is an irrigation well mapped approximately 390 feet from the permit boundary and approximately 3,600 feet northwest and upgradient of the Rich Pit mine area. This well was drilled in 1934 and is 45 feet deep with a groundwater level at 16 feet and a capacity of 1,000 gallons per minute (gpm). Due to the distance, groundwater levels and well capacities are unlikely to fall due to dewatering at the active Rich Pit mine area.

Plugged and Abandoned Wells:
The following wells are shown in the DWR database as being within 600 feet, but they are plugged and abandoned.

- Southwest Ready Mix (10552-R): This well was an irrigation well mapped approximately 390 feet from the permit boundary and approximately 3,600 feet northwest and upgradient of the active Rich Pit mine area. This well was plugged and abandoned in 1999.

- Southwest Ready Mix (10553-R): This well was an irrigation well mapped approximately 390 feet from the permit boundary and approximately 3,600 feet northwest and upgradient of the active Rich Pit mine area. This well was plugged and abandoned in 1999.

Area Wells Between Approximately 600 Feet and One-Half Mile of the Mine
A review of mapped, permitted wells on file at the DWR indicates there are approximately twenty-seven (27) permitted wells between 600 feet and one-half mile of the permit boundary. All of these wells are screened in the alluvium. Twenty-five (25) of these wells are of great distance from the active Rich Pit mine area and are unlikely to be affected by dewatering and reclamation. Two (2) of the wells are mapped just beyond the 600-foot permit boundary and may be affected by site dewatering. A discussion of these twenty-seven (27) wells and their relationship to permit boundary follows.

Upgradient Wells to the West

- A total of approximately seven (7) permitted wells are mapped upgradient of the site to the west. Five (5) of these wells are domestic wells and two (2) of these wells are irrigation wells. These wells are a great distance from the active Rich Pit mine area and impacts to these wells are not anticipated.

Upgradient Wells to the North

- A total of approximately twenty (20) permitted wells are mapped upgradient of the site to the north. Two (2) of these wells are domestic, two (2) are monitoring, eleven (11) are irrigation, and five (5) are stock wells. Some of the irrigation wells are converted for use in Substitute Water Supply Plans (SWSP). Two (2) of the stock wells on Martin Marietta property are mapped just beyond the 600-foot permit boundary and may be affected by dewatering operations at the Rich

Pit mine area. These two (2), potentially affected stock wells are described as follows:

VanGalder (Permit 207-WCB): This stock well is 45 feet deep, was drilled in 1954, and has a capacity of 40 GPM. No distances from section lines are included in the permit thus, the well is mapped in the center of Section 34 on Martin Marietta owned property. The exact location of this well within the section is unknown making it difficult to address potential impacts to this well by Rich Pit dewatering.

Martin Marietta (Permit 54581): This stock well is 21 feet deep, was drilled in 1964, and has a capacity of 25 GPM. This well appears to be accurately located and appears to be approximately 665 feet from the permit boundary and approximately 800 feet from the active dewatering area of the Rich Pit. There is no record of abandonment in the file. This well is not in use. Because the well is relatively shallow, decreased capacity could be expected at this well if Martin Marietta decided to use it. Review of the aerial image shows this well to be within center pivot irrigation system.

Mitigation Plan

Dewatering for site mining shown on Figure C2 has and will continue to draw down the water table in the surrounding area potentially affecting the capacity of nearby pumping wells if present. To date, Martin Marietta has not received complaints regarding nearby wells. Based on our review of available mapped permitted wells, we do not envision impacts to the monitoring wells east of the Site. We also do not anticipate impacts to wells south of the site because the river forms a hydrologic barrier. Pumping wells to the west of the site are a great distance from the dewatered mine area and impacts to capacity are not anticipated due to the distance, the depth of the wells, and the thickness of alluvial aquifer. Similarly, impacts to pumping wells located to the north of the site are generally not anticipated for the same reasons mentioned in the previous sentence.

If, during mining or reclamation, the miner receives a complaint from any well owner within 600 feet of the permit boundary, the miner will notify the DRMS.

After the DRMS has been notified, the miner will review the data and available information and submit a report to the DRMS within 30 days of notification. The evaluation will include discussions with the well owner who has contacted the miner regarding a concern and review of available baseline data from the well and vicinity to evaluate whether changes may be due to seasonal variations, climate, dewatering during mining, or other factors. The report will identify the extent of potential or actual impacts associated with any evaluation findings. If the extent of groundwater changes due to mining or reclamation activities is determined to be a significant contributing factor that has or may create adverse impacts, the mining associated impacts will be addressed.

Martin Marietta will begin implementing one or more mitigation measures if mining and reclamation activity is determined to be a significant factor to groundwater changes requiring mitigation.

Mitigation measures may include, but are not limited to:

- Placing water in a recharge pond to raise groundwater levels around the well.
- Cleaning the well to improve efficiency.
- Providing an alternative source of water or purchasing additional water to support historic well use in terms of water quantity and quality. If needed, water quality parameters will be checked in affected wells to ensure alternative sources support historic use.
- Modifying a well to operate under lower groundwater conditions. This could include deepening the well or lowering pumps. All work would be done at the miner's expense with the exception of replacing equipment that was non-functional prior to mining.
- Providing a well with a sump. The sump would allow for sufficient storage of water to allow historic well capacities to be met.
- It existing wells cannot be retrofitted or repaired, replacing the impacted well.

Please call if you have any questions.

Sincerely,

CIVIL RESOURCES, LLC

Gary Linden, P.G.
Senior Engineering Geologist

References

Colorado Department of Natural Resources, Division of Water Resources Well Permit Map, November 6, 2023.

Tweto, O. L., 1979, "Geologic Map of Colorado", U.S.G.S. Map compiled in association with the Colorado Geological Survey.

STRUCTURE ID: 1409025
STRUCTURE ID: 1409024
STRUCTURE ID: 1409026
ID: 164222–
OVERHEAD ELECTRIC LINE
U.S. HIGHWAY 50
COLO. STATE HWY 96
QC LAB
SCALE & SCALE HOUSE
SHOP
ID: 10552R
ID: 10553R
ID: 10554–R
ALSO INCLUDED IN PERMIT M2008001
PERMIT BOUNDARY
MARTIN MARIETTA MATERIALS REAL ESTATE INVESTMENT
600' OFFSET FROM PERMIT BOUNDARY
PLANT SITE
TAMMY J PROVOST
ID: 54581
ID: 207_WCB
PROPERTY LINE
SILT PONDS (2.4 ACRES TOTAL)
NOTE: MAY INCLUDE AN ASPHALT OR READY MIX PLANT ON THIS PARCEL AT ANYTIME AS ZONED WITH PUEBLO COUNTY
CONVEYOR
B–10–20
MARTIN MARIETTA MATERIALS REAL ESTATE INVESTMENT
PHASE I MINING AREA (54.6 ACRES) WITHIN AFFECTED AREA IN AM01
ID: 262268
ID: 4941–F
JAMES M AND SCOTT MEHRING
GASLINE
B–12–20
B–6–20
B–4–20
PHASE II MINING AREA (56.7 ACRES)
TEMPORARY OVERBURDEN & TOPSOIL STORAGE AREA
EXCAVATED (2' ABOVE WATER TABLE) USED FOR RECLAMATION
WITHIN AFFECTED AREA IN AM01
ID: 309763–
ID: 82714–F
ID: 279124–
PUEBLO EAST PHASE III LLC
ID: 3934–
COLORADO INTERSTATE GAS CO
NORTH BANK OF ARKANSAS RIVER
SILT POND, WATER (16.7 ACRES)
ID: 13556–
NORTH BANK OF ARKANSAS RIVER
ALLEN FAMILY LP
PREVIOUSLY MINED & RECLAIMED WITHIN AFFECTED AREA IN AM01
600' OFFSET FROM PERMIT BOUNDARY
ID: 68472–
MORLEY COMPANIES FAMILY INVESTMENTS
NORTH
0 250 500
(IN FEET)
Know what's below. Call before you dig.

CIVIL RESOURCES
8308 COLORADO BLVD
SUITE 200
FIRESTON, CO 80504
303.833.1416
WWW.CIVILRESOURCES.COM

Martin Marietta
MARTIN MARIETTA
1627 COLE BLVD, SUITE 200
LAKEWOOD, CO 80401
720.245.6400 (p)
CONTACT: JAMES SHARN

RICH PIT - M-1985-218
DRMS TECHNICAL REVISION
PUEBLO COUNTY, COLORADO

REVISIONS

NO.	DESCRIPTION	DATE

DESIGNED BY: xxx
DRAWN BY: xxx
CHECKED BY: xxx
DATE: 11/10/2023
SCALE: AS NOTED
AS NOTED
JOB NO.: ####
DWG NAME: RICH PIT.DWG

WELL LOCATIONS

SHEET:
FIGURE 1

J:\Martin Marietta -310\310.006 Rich Pit\Drawings\Sheets\RICH PIT.dwg, 22x34, 11/10/2023 11:56:21 AM