May 8, 2025

Jocelyn Carter and Patrick Lennberg
Environmental Protection Specialist
Colorado Division of Reclamation, Mining and Safety
1313 Sherman Street, Room 215
Denver, CO 80203

Re: Technical Revisions Portland Limestone Quarry – File M-1977-344
Point of Compliance Location

Dear Ms. Carter and Mr. Lennberg:

This Technical Revision is submitted for the above referenced mine permit to revise the nature of the point of compliance (POC) from a groundwater well to a surface water location. Conditions of DRMS approval of the above referenced mine permit includes the installation of a POC well prior to mine development in Section 24 of the Red Creek Quarry. The proposed location of the POC-1 well was downgradient of mining activities based on the hydrologic data collected during the Baseline Water investigation indicating the groundwater flow was northeast towards the Arkansas River (Figure 1).

Drilling operations to install groundwater well POC-1 using air rotary methods began on April 29, 2025. The Codell sandstone was encountered in the afternoon of April 29th, however, did not produce measurable water after pausing the drilling operations for two hours. The borehole was advanced below the Codell sandstone to a total depth of 240 feet below ground surface (bgs) by repeatedly drilling 20 feet then pausing an hour to check for the presence of measurable groundwater. Measurable groundwater was not encountered over 3 days of drilling. The total depth of POC-1 is more than 170 feet below the contact between the Codell sandstone and the underlying Blue Hill shale (Figure 2).

Water level data collected from four monitoring wells completed in the Codell sandstone (Figure 3) indicate this lithological unit is low producing and recharges slowly. The wells are not able to support low-flow sampling methods using a bladder pump and must be bailed dry a day before collecting a groundwater sample for analysis. The rate of groundwater recharge is slowest in the northernmost monitoring location, Well 2N, to collect a groundwater sample after purging. Regional geological maps and observations from the drilling observations of Well 2N identify numerous faults near and within the Red Creek Quarry property (Scott 1972 and Scott et al 1976). These structures could restrict groundwater flow in the Codell sandstone. Geologically indicating that it is likely that there is no hydrologic connection between the Codell sandstone across the drainage.

Red Creek is perennial in the area south of the POC-1 well location (Figure 4). Surface water was collected as part of the Baseline Water Investigation from three locations, a groundwater seep and locations upgradient and downgradient of the seep. Surface water samples were analyzed for the same suite of analytes as the groundwater samples to make direct comparisons of the two data sets. The Baseline Water Investigation concluded that the source of surface water in Red Creek is groundwater emanating from seeps and springs. Surface water chemistry collected at the SW-RC2 location fall within the range of the groundwater chemistry data for major ions and metals/metalloids (Figures 5 and 6).

Holcim proposes to complete the well in the POC-1 location screened across the Codell sandstone (Figure 7) and monitor for the presence of groundwater as part of the quarterly monitoring program.

Water chemistry samples will be collected from SW-RC2 for both surface and groundwater analytes listed in Table 2.7.4.1-1 and 2.7.4.1-2 of the Portland Limestone Quarries (M-1977-344) permit Amendment-02 to serve as the point of compliance to monitor for potential impacts from mining activities. In the event groundwater levels rise in POC-1 to collect a water quality sample both POC-1 well and SW-RC2 will be monitored for five consecutive quarters. After five quarters of data is collected, Holcim will submit a Technical Revision to establish POC-1 well as the compliance point.

References

Scott, G.R., 1972, Reconnaissance geologic map of the Hobson quadrangle, Pueblo and Fremont Counties, Colorado, USGS

Scott, G.R., Taylor, R.B., Epis, R.C., and Wobus, R.A., 1976, Geologic map of the Pueblo 1 degree x 2 degrees quadrangle, south-central Colorado. USGS.

Please feel free to contact me directly with any questions.

Respectfully submitted,

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Cc: Hamza Mekhfi – Portland Plant Manager
Timothy Smith – Portland Plant – Quarry Manager
Dr. Angela Bellantoni – Environmental Alternatives, Inc.

Figure 1 – Approximate Location of the future POC Well
Figure 2 – POC-1 lithology log
Figure 3 – Groundwater well location map
Figure 4 – Surface water monitoring and observation locations
Figure 5 - Piper diagram of all surface and groundwater well data
Figure 6 - Scatter plots of groundwater and surface water metals/metalloid concentrations
Figure 7 – POC-1 proposed Well Completion