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MEMORANDUM

date July 13, 2018

to **Christopher Hoem, AICP, Senior Planner**
Rob Eastwood, AICP, Planning Manager
Department of Planning and Development
County of Santa Clara

from Peter Hudson, CEG
Sutro Science, LLC

Subject Technical Peer Review: *Status Report on East Material Storage Area (EMSA)*
Permanente Quarry
Prepared by: Lehigh Southwest Cement Company
July 6, 2018

Sutro Science LLC (Sutro) has prepared this memorandum to provide technical peer review comments on the latest submittals from Lehigh Southwest Cement Company (Lehigh) for its Permanente Quarry in Cupertino, California. Sutro reviewed these three documents:

Permanente Quarry, Mine ID# 91-43-0004
Status Report on East Material Storage Area
Prepared by: Erika Guerra, Environmental Director, Lehigh
July 6, 2018

EMSA Stormwater Runoff Evaluation Update, Lehigh Permanente Facility, Santa Clara, CA
Prepared by Golder Associates Inc. for Lehigh
June 26, 2018

EMSA Sediment Sampling, Lehigh Permanente Quarry Facility
Prepared by Golder Associates, Inc. for Lehigh
November 3, 2017

Sutro understands that this technical peer review memorandum will supplement the County's staff report, which is currently being prepared for the Santa Clara County Planning Commission hearing on July 26, 2018. In this memorandum, we summarize the recent actions taken by Lehigh at the EMSA and Lehigh's proposed plans to address selenium runoff from the EMSA. We then provide conclusions based on our technical peer review of the documents listed above.

In its May 27, 2017 hearing, the Santa Clara County Planning Commission (Planning Commission) directed Lehigh to complete by September 1, 2017 five measures that address selenium concentrations in stormwater runoff from the EMSA and Pond 30. The measures were:

- Collect and analyze samples of sediment from the bottom of Pond 30 to determine whether the sediments contribute to selenium concentrations in the stormwater runoff detained by Pond 30,
- Extend the existing French drain approximately 100-feet to collect additional seepage from the slope adjacent to Pond 30,
- Install an additional 60-gallon per minute (gpm) pump to capture water from the French drain collection system,
- Enhance the pipeline system to transfer water from the French drain system to the treatment plant, and
- Expand the surface water monitoring program into the 2017/2018 rainy season to continue accessing the quality of the water entering Pond 30 and the performance of the non-limestone cover.

In addition, the Planning Commission directed Lehigh to remove the existing sediment from Pond 30 and install a liner to eliminate subsurface seepage. This was to occur within four months of the California red-legged frog (CRLF) clearance from the US Fish and Wildlife Service.

Summary of Lehigh's Recent Actions at the EMSA

This section discusses the actions that Lehigh has completed at the EMSA in response to the Planning Commission directives listed above.

Sediment Sampling at Pond 30

Lehigh sampled Pond 30 sediments in May 2017 and May 2018. The 2017 sampling event included 5 sampling locations: 3 from Pond 30 and 2 from the swale that conveys runoff to Pond 30. Samples were collected from the surface and at a depth of 1 foot at each location. Due to safety concerns in Pond 30, the 2018 sampling event only collected three samples from the Pond 30 swale. The sediment samples were analyzed by a certified laboratory for total selenium (EPA Method 6020). Based on the results, three sediment samples from each sampling event were analyzed for the selenium solubility using the Soluble Threshold Limit Concentration (STLC) CAM Extraction Test (WET). This test is used to measure how much selenium would become soluble in water and thus contribute to the concentration of selenium in the Pond 30 stormwater discharge.

Analysis of the sediment samples collected in 2017 and 2018 detected selenium ranging from below the detection limit of 0.11 milligrams per kilogram (mg/kg) to 0.87 mg/kg. The highest concentration in Pond 30 was 0.87 mg/kg from a sample obtained at a depth of 1-foot near the outlet pipe. The highest concentration in the drainage swale was 0.85 mg/kg in a sample collected at the surface. Three samples from each year with the highest total selenium concentrations were then submitted for STLC analysis. STLC results indicated soluble selenium concentrations ranging from 0.60 micrograms per Liter (µg/L) to 4.3 µg/L. These concentrations are below the Basin Plan Water Quality Objective for total recoverable selenium of 5 µg/L.

French Drain Extension and Improvements

Rather than extend the French drain 100 additional feet, make improvements to its pumping capacity, and install a conveyance pipeline to the treatment plant, Lehigh opted to enhance the Pond 30 drainage system

to capture stormwater from Pond 30 and convey it to Pond 11 instead of allowing it to discharge to Permanente Creek. The existing French drain collection system was also plumbed into this system. Lehigh constructed a concrete vault between the Pond 30/Permanente Creek discharge outfall and equipped the vault with two 440-gpm pumps and a 12-inch pipeline that extends from the vault to Pond 11 and the Final Treatment System (FTS). The downgradient discharge pipe to Permanente Creek was cut and plugged. These improvements provide treatment of Pond 30 runoff and eliminate the discharge of selenium-bearing stormwater to Permanente Creek.

Surface Water Monitoring Program

Lehigh conducted surface water sampling during rain events that occurred on March 1, March 16, and April 7. These sampling events were conducted in a similar manner to those in previous years and included sample locations from the 2016/2017 events. In the 2018 sampling events, Lehigh's consultant, Golder Associates, Inc. (Golder), targeted areas with runoff and/or sheet flow on the non-limestone cover, on areas where water was seeping at the slope toe, and in the swale that conveys water to Pond 30. More samples were collected where stormwater had accumulated on the cover material than from areas where water was seeping out of the base of the EMSA slopes. Golder observed that seepage from the slopes appeared to be less than previous years and attributed it to a reduced amount of rainfall in the 2018 season. Rainfall near the Lehigh facility for the 2017/2018 rainy season was 10 inches, as recorded at the Santa Clara Valley Water District gauge at Maryknoll Fields. A total of 18.3 inches of rain was recorded at this gauge in the 2015/2016 rainy season and over 30 inches were recorded during the 2016/2017 rainy season.

A total of 24 surface and seepage samples were collected during the three rain events. Laboratory analysis detected selenium in these samples ranging from 0.40 µg/L to 17 µg/L. In general, selenium concentrations in the surface water have decreased compared to previous years. The Basin Plan Water Quality Objective for total recoverable selenium of 5 µg/L was exceeded in 5 of the 24 samples collected during the three sampling events. The highest exceedance was that of 17 µg/L found in a cover sample from the March 1 sampling event; resampling at this location on April 7 indicated a concentration of 1.9 µg/L. A concentration of 13 µg/L was found at the point where the upper pond flows into Pond 30. The 5 µg/L water quality objective was also exceeded (6 µg/L and 6.4 µg/L) in two cover samples, however, these concentrations decreased to below 5 µg/L during the April 7 sampling event. Selenium was detected at 9.2 µg/L in one sample from the Pond 30 swale during the April 7.

Conclusions from the Technical Peer Review

In general, Sutro continues to be encouraged by results of the stormwater sampling and supports Lehigh's efforts to eliminate the discharge of selenium-laden stormwater to Permanente Creek.

Sutro concurs with methodology Golder used to evaluate the sediment in Pond 30 and agrees that the sediments do not appear as a major source of selenium in the Pond 30 discharge. However, it is our opinion that selenium-bearing sediments do represent a contributing source and therefore, we support Lehigh's proposed efforts to remove the sediment from Pond 30 and install a liner in the Pond 30 basin and adjacent drainage swale.

Sutro concurs with and strongly supports Lehigh's retrofit of the Pond 30 discharge system that captures stormwater in the vault and reroutes it to Pond 11 and the FTS. Eliminating Pond 30 discharges to Permanente Creek through this method represents a viable solution that will be beneficial to water quality

in Permanente Creek. Connecting the French drain discharge to this system was also an advantageous solution to reduce selenium-containing seepage discharge into Pond 30.

Sutro supports Lehigh's efforts to continue and expand the EMSA water sampling program and agrees with the water sampling methodology employed by Golder. The results of the sampling program demonstrate that, in general, selenium concentrations in the stormwater runoff and slope-toe seeps on the EMSA are decreasing when compared to previous wet years. However, this may be due in part to lower rainfall during the 2017/2018 wet season. Detected selenium concentrations in the swale and Pond 30 also indicate that the French drain system is reasonably effective in capturing selenium-bearing seepage water from the slope adjacent to Pond 30. It should be noted that the concentrations of selenium in the surface runoff, seeps, and in Pond 30 are occurring on a non-limestone cover, which is an interim cover representing the underlying base layer of the final growth medium and vegetative layer that will constitute the next step in the reclamation process.

Recommendations

- Sutro recommends that Lehigh continue to pursue its proposal to remove the sediment that is currently in Pond 30 and the drainage swale and install a geomembrane (or similar) liner along the bottom of these features. A liner would facilitate pond maintenance and periodic removal of sediments that accumulate during the wet season and would reduce the time that retained storm water contacts selenium-bearing sediment. A liner would also reduce seepage of selenium-bearing surface water to the underlying groundwater system. We understand that negotiations with the US Fish and Wildlife Service regarding clearance for the California red-legged frog are still underway.

- Sutro recommends that Lehigh continue to implement the wet season surface water monitoring program at the EMSA consistent with the sampling procedures and protocols from previous years to fully characterize the performance of the interim non-limestone cover and to evaluate water quality in the runoff flowing to and being captured in Pond 30. Lehigh should adapt and, if necessary, expand the monitoring program accordingly if conditions at the EMSA change, such as: 1) significant events (manmade or through natural processes) that alter conditions or observed performance of the non-limestone cover, 2) years with higher-than-normal or record rainfall (e.g. winter of 2016-2017), 3) field observation made during sampling that indicate a previously undocumented stormwater accumulation or flow condition, and/or 4) laboratory data that indicate anomalously elevated concentrations of selenium in ponded stormwater runoff or toe-slope seepage flows.