CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER No. R2-2018-0028

WASTE DISCHARGE REQUIREMENTS

HANSON PERMANENTE CEMENT, INC.
and
LEHIGH SOUTHWEST CEMENT COMPANY

PERMANENTE QUARRY AND CEMENT PLANT
24001 STEVENS CREEK BOULEVARD
CUPERTINO, SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, hereinafter the Water Board, finds that:

OWNERSHIP AND LOCATION

1. Hanson Permanente Cement, Inc., owns and Lehigh Southwest Cement Company operates a limestone quarry and cement manufacturing plant called the Permanente Quarry and Cement Plant (hereinafter called the Site). These two parties will hereinafter be referred to collectively as the Dischargers.

2. The Site occupies 672.7 acres of a 3,510-acre property located at 24001 Stevens Creek Boulevard in Cupertino, in the unincorporated foothills of western Santa Clara County at the end of Stevens Creek Boulevard. The Site comprises the headwaters of Permanente Creek, which runs along the west, south, and eastern border of the Site. An unnamed tributary to Permanente Creek makes up the Site's northern perimeter (Figure 1).

3. The Site has undergone several changes in name, ownership, and operation, as follows:

   a. Since 1939 and until July 1, 2008, Hanson Permanente Cement, Inc., or its predecessor(s), owned and/or operated the Cement Plant, Quarry, and related property at the Site. The Permanente Corporation, was formed on February 25, 1939. The name of that corporation changed several times between 1943 and 1979 (changed to Permanente Cement Company on February 25, 1943, Kaiser Cement & Gypsum Corporation on July 2, 1964, and to Kaiser Cement Corporation on May 1, 1979). Kaiser Cement Corporation merged twice, once with Kaiser Cement Corporation of Delaware on May 4, 1982 (Kaiser Cement Corporation of Delaware survived) and then with Superlite Builders Supply, Inc., of Arizona on February 3, 1989 (Superlite Builders Supply, Inc., survived and, on the same date, changed its name to Kaiser Cement Corporation). On February 19, 1999, Kaiser Cement Corporation changed its name to Hanson Permanente Cement, Inc. On July 1, 2008, Hanson Permanente Cement, Inc., leased the Cement Plant, Rock Plant, Quarry, and property related to its corporate affiliate Lehigh Southwest Cement Company to operate.

   b. On August 10, 1995, Kaiser Cement Corporation purchased 152 acres from Kaiser Aluminum and Chemical Company (Kaiser Aluminum) where Kaiser Aluminum had previously operated its Aluminum Plant and/or other activities. From 1941 to 1990, Kaiser Aluminum used the Site for the manufacture of magnesium and aluminum foil products and for aluminum research activities. During World War II, the facility was reportedly

used to manufacture magnesium incendiary bombs. Current ownership of the former Aluminum Plant is retained by the Dischargers.

PURPOSE OF ORDER

4. The Water Board issues Waste Discharge Requirements (WDRs) to regulate discharges to land pursuant to California Code of Regulations (CCR) 27 (Title 27) and section 13263 of the California Water Code (CWC). This Order governs wastes and activities that generate waste at the Site that have the potential to impact groundwater and hydrogeologically-connected surface waters for the protection of human health and the environment. This includes current and historical disposal activities, aspects of quarrying operations that generate waste, and reclamation of disposal units. Specifically, these WDRs:

    a. Require that the Dischargers develop a Self-Monitoring Program (SMP) consistent with Title 27 to enable the detection of chemical releases from the Site and to evaluate whether groundwater and hydrogeologically-connected surface waters have been impacted by current or historical activities. In addition, it requires baseline monitoring to dictate reclamation plans, which includes expansion of the existing groundwater monitoring network and development of an updated conceptual site model;

    b. Require an Operation, Maintenance, and Contingency Plan for waste management units (WMUs) to ensure containment procedures and monitoring infrastructure are properly operated and sufficiently monitored and maintained to be effective;

    c. Require Closure and Post-Closure Maintenance Plans to ensure reclamation strategies are adequately protective and that implementation will not impact groundwater or hydrogeologically-connected surface waters; and Preliminary Closure Plans (to be updated biennially) to enable Water Board staff oversight of interim preparations and evaluation of reclamation strategies; and

    d. Require financial assurances to demonstrate that the Dischargers are capable of covering costs associated with closure and post-closure maintenance, as well as corrective actions should a release be identified.

SITE DESCRIPTION AND HISTORY

5. Limestone has been mined at the Site since approximately 1903 for use in the production of cement and/or aggregate materials. Waste materials including overburden and waste rock, as well as processing residuals, are disposed of in two areas of the Site, the West and East Materials Storage Areas (WMSA and EMSA, respectively; see Figure 2). Though this material is naturally-occurring rock, the removal of the material from its native bedrock environment renders it mining waste. Title 27 section 22480 defines mining waste as: "*Waste from the mining and processing of ores and mineral commodities. Mining waste includes: 1) overburden; 2) natural geologic material which have been removed or relocated but have not been processed (waste rock); and 3) the solid residues, sludges, and liquids from the processing of ores and mineral commodities.*"

The threat to water quality from waste rock is greater than from native bedrock. The quarrying process (blasting, excavation, crushing, etc.) transforms bedrock into particles, sized from fine silt to cobbles. This process increases the surface area that is subjected to weathering, increasing its leaching potential. For example, exposure to oxygen and water can result in the solubilization (dissolution and potential mobilization) of some metals and metalloids that would otherwise be bound in the bedrock.

6. Wastes from cement manufacturing are not currently disposed of in the WMSA and EMSA, but the WMSA was used historically for this purpose. The preparation of cement involves rock mining, crushing, and grinding of raw materials comprised of limestone, clay, sand, and iron ore (materials bearing lime, alumina, silica, and ferrite respectively); calcining the materials in a rotary kiln; cooling the resulting intermediate product called clinker; mixing the clinker with gypsum; and then finally milling, storing, and shipping or bagging the finished cement product. Cement wastes, including cement kiln dust and bricks, may contain heavy metals and have a high pH (basic), potentially contributing to alkalinity in waters that come into contact with the wastes. This is relevant because the pH of waters affects the solubility (leaching capability) of metals and metalloids, such as reducing the leachability of some metals and increasing it for some metalloids, including selenium. The WMSA was used historically for disposal of aggregate fines (very small particles) that were a waste product of aggregate production on Site. These materials are classified as designated waste in Title 27 for similar reasons as the waste rock.

7. Several historic disposal units or other potentially-contaminated sites, including the Dry Canyon Storage Area (DCSA), the Former Surface Impoundment (FSI), the Upper Level Landfill (ULL), the Former Asphalt Plant Area (FAPA), and the Former Brine Pond (FBP) are present at the Site, buried beneath the EMSA (see Figure 2). These units were used for the disposal of mining and cement manufacturing wastes; however, waste disposal practices of the time make it likely that other types of wastes may be present, for instance from the manufacture of aluminum foil or incendiary bombs as described in Finding 3.b. These units are considered part of the EMSA under these WDRs and therefore regulated as a WMU to ensure waste remains isolated.

8. **Waste Characterization**: Given the long history of use and the fact that disposal units onsite have been in operation since before recordkeeping was required or this activity was regulated, it is anticipated that the WMSA and EMSA may contain wastes other than waste rock and aggregate fines. These wastes may include kiln bricks, other mining or cement manufacturing wastes, chemical drums, or storage tanks. In addition, limestone that was not deemed sufficiently valuable to process at the time of extraction was disposed of historically. Limestone at the Site contains selenium that, under some conditions, can potentially leach into water it comes into contact with. As discussed further in the Regulatory History section below, the Dischargers conducted a waste characterization investigation of the waste piles, evaluating the solid waste for a comprehensive list of potential constituents of concern (COCs), by drilling subsurface borings. No evidence of such materials was identified.

However, this and other historical waste characterization investigations were restricted by the size and volume of wastes contained within the WMSA and EMSA, which prohibits a comprehensive in situ characterization that would definitively resolve whether other types of wastes are present (i.e., a small, discrete volume of highly contaminated waste can remain undetected). Therefore, to be adequately protective of human health and the environment it is reasonable and necessary to monitor groundwater as an exposure pathway for a broad list of potential COCs. To meet this objective, the Dischargers have been monitoring groundwater since August 2015, and Provision 3 of this Order requires the monitoring network be expanded for both Detection Monitoring (to detect a possible release to groundwater) and Evaluation Monitoring (to investigate evidence that a release may already have occurred). Additional waste characterization will be necessary and possible in the WMSA during reclamation if materials are removed from the pile for use as backfill in the Quarry Pit as is currently proposed in the Site Reclamation Plan. Provision 4 of this Order requires that the Dischargers submit Preliminary Closure Plans, and Provision 5 requires final Closure and Post-Closure Maintenance Plans to demonstrate that reclamation will not adversely impact groundwater. Provision 4 specifically requires WMSA material be further characterized prior to use as Quarry backfill material, if the Dischargers proceed with this approach.

9. **Waste Containment:** Current waste containment practices for the WMSA and EMSA consist of stormwater controls (e.g., best management practices such as berms, wattles, settling ponds, gabion basket check dams, floc logs, or active treatment for stormwater from the EMSA) to minimize the discharge of runoff that has come in contact with mining waste. Stormwater discharges from the Site are regulated under the Site's National Pollution Discharge Elimination System (NPDES) permit (see Appendix A, Regulatory History Outside the Scope of these WDRs). While this Order does not duplicate the NPDES requirements, Provision 7 requires the Dischargers to submit an Operation, Maintenance, and Contingency Plan that will describe the implementation of necessary controls to control contaminant mobility from all WMUs, including the WMSA and EMSA. Section 22470(b) of Title 27 permits the exemption of liner requirements provided that water quality monitoring is sufficient to promptly detect a release and contingencies are in place, which are addressed by Provisions 3 and 7.

10. The cement plant has been operating since 1939 and has supplied cement and other construction materials like stone, sand, and gravel to the Bay Area since 1923. Currently, 95% of the products manufactured on the Site are utilized locally in the Bay Area. Discharges to waters of the United States, including storage in surface impoundments (ponds) associated with the cement manufacturing process, are regulated under the NPDES permit and are therefore not covered under these WDRs.

Regulatory History Related to These WDRs

11. These WDRs address past, current, and future activities with the potential to impact groundwater that are not addressed by other Water Board programs (stormwater, and mining and cement manufacturing process wastewater, and surface impoundment/pond discharges are regulated under an NPDES permit). This Regulatory History section therefore is limited to historical regulatory actions taken related to the development of these WDRs. A brief description of additional regulatory history can be found in Appendix A.

12. The Site has heretofore not been regulated under Title 27 WDRs; however, Water Board staff have required multiple investigations (via letter requirements pursuant to CWC section 13267) to identify whether current or historical activities have impacted or have the potential to impact groundwater. Much of this information was also collected to develop these WDRs, specifically to generate provisions (the technical report requirements in section C of this Order) that ensure the Dischargers are operating the Site and planning future site closure/reclamation in a manner that is protective of human health and the environment. This section describes the purpose and results of historical investigations. Interpretations, conclusions, and justification for these provisions can be found in subsequent findings (18 through 34).

13. **Order No. R2-2013-1005:** Water Board staff issued a letter order pursuant to CWC section 13267 on January 22, 2013 (amended in June 2013), to require the submittal of information to initiate several regulatory actions across Water Board programs. Requirements pertaining to activities regulated by these WDRs include Site History and Potential Pollutant Source Identification Reports. The objective was to determine if the Site has the potential to impact groundwater, either due to current or historic activities. Known activities included limestone mining, cement and former asphalt plant manufacturing, and former aluminum and magnesium research and manufacturing. The 2013 order also required the submittal of chemical inventories, storage and transport information (tanks, trunks, and pipes), and documentation pertaining to past releases. However, the Site was in operation before regulation and before waste records were kept. In addition, a fire at the Site destroyed some documentation. Therefore, it was not possible to predict all potential sources of pollution, and it was therefore not possible to limit the list of potential COCs required in waste characterization and groundwater investigations.

14. **Report of Waste Discharge:** To evaluate if waste storage and disposal practices specifically could be impacting or have impacted groundwater, Water Board staff issued a letter order pursuant to CWC section 13267 on July 20, 2012, to require the Dischargers submit a Report of Waste Discharge (ROWD). This submittal is required of all disposal activities regulated under Title 27, to characterize onsite wastes as potential sources of pollution to State waters. The ROWD submitted by the Dischargers indicated that the WMSA and EMSA and ponds onsite were potential candidates for regulation under Title 27; however, further information was required to develop WDRs, prompting subsequent requirements described below.

15. **WMSA, EMSA, and Pond Waste Characterization Investigation:** In a separate letter order pursuant to CWC section 13267 on January 22, 2013, the Dischargers were required to submit

workplans and reports to characterize mining wastes onsite, including solid material extracted from the Quarry and disposed of in the WMSA and EMSA, and settled solids in onsite ponds. In addition, liquids in ponds that came into contact with solid mining wastes, which could potentially be classified as mining waste (for example, if contaminants were dissolved or entrained in the process), were also characterized. The list of potential COCs included inorganic (metals and metalloids, like selenium) and organic contaminants (including polychlorinated biphenyls or PCBs, pesticides, volatile and semi-volatile organic compounds or VOCs and SVOCs, and petroleum hydrocarbons). The results of these investigations indicated:

a. Liquid waste units: Several ponds contain concentrations of contaminants that exceed the applicable water and soil quality objectives (WQOs and SQOs, respectively) for the protection of drinking water and/or aquatic habitat. Concentrations of selenium, cadmium, molybdenum, nickel, and vanadium were elevated in samples from the water column, but were within an order of magnitude of WQOs. Mercury and total petroleum hydrocarbons (as diesel and motor oil) were greater than an order of magnitude above WQOs. In pond sediments, concentrations of metals, selenium, and arsenic exceeded several SQOs for the protection of ecological health.

   Water Board staff have subsequently determined it is appropriate to regulate surface water discharges under the NPDES and Total Maximum Daily Load (TMDL) programs and not under Title 27. Data was therefore provided to Water Board staff responsible for the NPDES permit and development of the selenium TMDL for Permanente Creek to aid regulation of surface water at the Site. Since this investigation was performed, the Dischargers have substantially modified and improved the onsite ponds. Several were excavated and lined; others were abandoned or use has been severely restricted, with flow redirected to lined ponds.

b. Solid waste units: The solid waste units consist primarily of limestone quarry overburden waste rock. Overburden waste placed in the solid waste units consists of rocks of the Franciscan Complex and Santa Clara Formation rocks, including chert, greenstone, and low-grade limestone that, at the time of quarrying, was not profitable for use in cement production. These wastes were chemically characterized and leaching tests conducted and determined to contain metals and metalloids, including arsenic, selenium, thallium, cobalt, vanadium, mercury, and copper above soil and groundwater quality objectives, the latter pursuant to leaching tests. The leaching tests suggested relatively low metal solubility in de-ionized water, which typically has a neutral or slightly acidic pH (due to reaction with the air); however, groundwater at the Site is neutral to basic (6.7-9.5). The solubility of selenium and arsenic may therefore be higher than the leaching tests indicate. These results prompted Water Board staff to require further waste characterization of the WMSA and EMSA in June 2013 (see below Waste Pile Runoff and Seep Investigations).

   These results confirmed that the WMSA and EMSA contain waste materials that have the potential to contaminate groundwater and hydrogeologically-connected surface

water, thus meeting the classification for Group B mining wastes (as defined by Title 27). These waste disposal units are therefore regulated as WMUs in these WDRs. Contaminant transport of the particulate fraction is relevant for surface water discharges, which is regulated by the Site's NPDES permit and is also being evaluated in the development of the TMDL for selenium in Permanente Creek. Potential impacts to groundwater necessitated a groundwater investigation, described below.

16. **Waste Pile Runoff and Seep Investigation:** On June 26, 2013, Water Board staff issued a letter order pursuant to CWC section 13267, in which the Dischargers were required to evaluate runoff and seeps from the WMSA and EMSA. The objective was to identify whether COCs were mobilized by contact of the wastes with stormwater (note that this analysis occurred prior to the Dischargers later implementing best management practices and interim reclamation activities designed to improve water quality). Results showed elevated concentrations of metals and metalloids, indicating particulate transport, and elevated concentrations of dissolved selenium. The results found that total (unfiltered) concentrations of mercury, copper, selenium, lead, silver, thallium, and zinc were elevated, and dissolved (filtered) selenium concentrations were above WQOs. Subsequent sampling of stormwater runoff conducted pursuant to requirements from Santa Clara County support the conclusion that selenium concentrations are elevated. This confirmed that inorganic contaminants are mobilized by stormwater running over and through the waste piles. Surface water impacts are regulated under the Site's NPDES permit; however, these results increased Water Board staff's concern about potential impacts to groundwater, prompting a hydrogeologic investigation requirement.

17. **Hydrogeologic Characterization and Groundwater Investigation:** In the same June 26, 2013 letter order, the Dischargers were required to submit a workplan and then conduct a hydrogeologic characterization and groundwater investigation, including the development of a Conceptual Site Model. The primary objectives of the characterization were to determine if the WMUs have contaminated groundwater and to characterize groundwater flow to identify potential contaminant flow pathways and receptors (including the interaction of groundwater and surface water). A groundwater well network was installed by the Dischargers during autumn 2015 (see Figure 3). Difficulty gaining access or agreements to drill and install monitoring wells offsite prohibited the installation of groundwater wells north of the Site within a reasonable timeframe; therefore, seeps from the fractured bedrock were monitored in this area. A description of the results can be found below in the Current Hydrogeological Conceptual Site Model and Monitoring Program section.

Geologic Setting

18. The Site is located within California's Coast Range geomorphic province and overlies three geologic formations as illustrated in Figure 4:

    a. The western portion of the Site (including most of the WMSA) overlies fractured bedrock of Mesozoic metavolcanics (Mzv), including andesite, rhyolite, greenstone, volcanic breccia, and other pyroclastic rocks, in part strongly metamorphosed. This

portion of the Site includes volcanic rocks of the Franciscan Complex (basaltic pillow lava, greenstone, and minor pyroclastic rocks).

b. The center of the Site (including the eastern portion of the WMSA, the Quarry Pit, and the Quarry Office/Maintenance Area) overlies Cretaceous-Jurassic marine sedimentary and meta-sedimentary rocks (KJf). These units are also part of the Franciscan Complex, including sandstone with smaller amounts of shale, chert, conglomerate, as well as the limestone that is mined for cement production. The limestone units are of limited extent and occur within a structural block that is truncated and surrounded by greenstone and greywacke.

c. The eastern portion of the Site (including the EMSA and the cement manufacturing plant) overlies Pliocene-Pleistocene non-marine (continental) sedimentary rocks of the Santa Clara Formation (QPc), which consists primarily of loosely consolidated sandstone, shale, and gravel deposits and which in turn overlie rocks of the Franciscan Complex.

Seismicity

19. The Site is located approximately two miles east-northeast of the San Andreas fault zone, which is capable of a Richter Magnitude 8 earthquake. For design purposes, ground shaking at the Site was estimated using probabilistic methods for an earthquake with a 10 percent probability of exceedance in a 50-year period. Using the 2008 Update of the United States National Seismic Hazards Maps (Peterson, et. al., 2008), which utilizes the findings of the next Generation Attenuation Relation Project, it is estimated the design peak ground accelerations for the Site are approximately 0.57g.

20. The San Andreas Fault Zone is located approximately two miles southwest of the Quarry (Figure 5). The Sargent Berrocal Fault Zone (SBFZ), part of the Santa Cruz Mountains front-range thrust fault system, parallels the San Andreas to the east and forms the eastern-most structural boundary to the Permanente Terrain. Near the Site, the SBFZ consists of two northwest-trending, sub-parallel faults, the Monta Vista Fault Zone on the northeast and the Berrocal Fault Zone on the southwest. The Monta Vista Fault Zone is located approximately one mile to the northeast of the Quarry along the northeastern boundary of the Site and forms the fundamental geologic and hydrogeologic boundary between the basement bedrock units at the Site and the much younger water-producing alluvial units downgradient of the Site in the Santa Clara Valley. A strand of the Berrocal Fault Zone extends beneath the cement plant area, south of the EMSA, and extends westward into other portions of the Site. The Monta Vista Fault Zone forms the fundamental geologic and hydrogeologic boundary between the basement bedrock units at the Site and the much younger water-producing alluvial units downgradient of the Site in the Santa Clara Valley. The fault zone redirects shallow groundwater and surface water flow from the Site north and then east, as described in the next section.

Hydrogeology and Hydrology

21. The Site is located in upland bedrock terrain that slopes eastward toward the Santa Clara Valley. Surface water and groundwater flow from the bedrock hills towards the alluvial valley. The primary groundwater basin near the Site is the Santa Clara Valley Groundwater Basin. The Site lies just to the west of the Santa Clara sub-basin (2-9.02) of the Santa Clara Valley Groundwater Basin, and the remaining portion of the Site overlies fractured bedrock that drains to these basins. The western boundary of the Santa Clara Valley Groundwater Basin is generally considered to be the contact of the alluvial valley deposits with the consolidated bedrock formations in the hills. The contact between the alluvial valley and the bedrock formations is the Monta Vista Fault Zone, which may limit hydraulic communication between the bedrock and alluvium (*Hanson, R.T., Li, Zhen, and Faunt, C.C., 2004, Documentation of the Santa Clara Valley regional ground-water/surface water flow model, Santa Clara County, California: U.S. Geological Survey Scientific Investigations Report 2004–5231*).

22. Groundwater typically occurs at depths of 80 to 120 feet in the upland hillside terrain and at shallower depths (10 ft to 40 ft) at lower elevations. Structural complexity also creates locally perched and semi-confined conditions. In general, first-encountered groundwater at the Site occurs under unconfined conditions. Groundwater occurs within the Santa Clara Formation in the eastern portion of the Site in both secondary openings (i.e., fractures, joints, shears zones, and faults) and potentially in primary pore spaces within the more permeable sandstones and conglomerates. Groundwater also occurs in the fractured bedrock in the remainder of the Site; however, the occurrence of groundwater at depth within the Franciscan bedrock is almost exclusively within secondary openings such as joints, fractures, shear zones, and faults, in contrast to primary porosity or pore spaces within the rock. Because of the limited amount of storage capacity and the relatively low permeability, the Franciscan is considered by the State Department of Water Resources (DWR) to be “nonwater-bearing” with respect to production of usable quantities of water. However, groundwater flow in the highly weathered upper portion of the Franciscan bedrock is not necessarily fracture-controlled but similar to an equivalent porous media.

23. In general, the Santa Clara Formation rocks overlie the Franciscan Assemblage, and the formations are in hydraulic communication. In some areas, the Santa Clara Formation is considered to be part of the alluvial valley deposits that make up the Santa Clara Valley Groundwater Basin. However, the portion of the Santa Clara Formation that is considered to be water-bearing is that which dips beneath the younger alluvial deposits in the large valley areas, northeast of the Monta Vista Fault, and not that portion of the formation that is located west-southwest of the Monta Vista Fault Zone. The Site is located in upland bedrock terrain west of this basin. The boundary of the Santa Clara Valley Groundwater Basin is generally considered to be the contact of the alluvial valley deposits with the consolidated bedrock formations at the surface and beneath the alluvium. As discussed above, the contact between the bedrock and the alluvium is a fundamental structural boundary formed by the Monta Vista Fault Zone that may limit hydraulic connection between the bedrock and the alluvial basins. At the Site, this contact is located just northeast of the Site property line. (Hanson USGS, 2004).

24. Figures 6 and 7 illustrate groundwater flow in wet and dry seasons in the vicinity of the WMSA and EMSA, respectively. Groundwater levels and flow directions are controlled primarily by the terrain and geology of each sub-basin of the WMSA and EMSA. The flow direction in the WMSA appears to be controlled by the ridgeline that runs from west to east, which acts as a groundwater divide to the north of all but a very small portion of the WMSA. Groundwater south of this ridgeline flows to the south and southeast toward Permanente Creek. Groundwater from the western and northern parts of the WMSA flow to the south and southeast, and, along the eastern portion of the WMSA, flow is to the south and southwest. A divide is present along the eastern limit of the WMSA that is influenced by quarry operational activities.

    The EMSA sits astride two sub-drainage basins separated by a prominent north-south trending ridge. Groundwater in this area appears to flow toward the southwest and south. The eastern portion of the EMSA is situated to the east of the north-south ridge in a separate sub-drainage basin that drains predominately to the south and east toward Permanente Creek. Along the northern ridgeline, groundwater flow is to the north and northeast.

25. In 2000, the State Water Resources Control Board (State Water Board), Division of Water Quality, created a California map identifying soil or rock conditions that may be more vulnerable to groundwater contamination. Based on information from DWR Bulletin 118-1 (Appendix A, pg. 85), the Santa Clara sub-basin has been designated as a Hydrogeologically Vulnerable Area. These areas are considered more susceptible to groundwater contamination due to hydrogeological conditions that "allow recharge at rates substantially higher than in lower permeability or confined areas in the same groundwater basin." The designation includes mountain or foothill areas of fractured rock that provide primary recharge to it; thus, the entirety of the Site is covered under this Hydrologically Vulnerable designation. A shape file and documentation of this designation can be found at https://www.waterboards.ca.gov/water_issues/programs/gama/publications.shtml.

26. The regional-scale direction of groundwater flow is interpreted to be from west to east, flowing from the topographic high at Black Mountain toward the Santa Clara Valley. Based on fundamental hydrogeologic principles and supported with hydrogeologic data collected to date, groundwater flow in the area of the main Permanente Creek drainage basin is interpreted to flow toward the north from the steep groundwater divides/ridges separating Permanente Creek from Monte Bello Creek to the south and to the south from the ridge separating Permanente Creek from Ohlone Creek (also known as Wildcat Canyon Creek) to the north. In other words, groundwater flow is generally from the main ridge crests toward the primary drainages in the region, where it subsequently discharges. Groundwater is also captured by the Quarry, which acts as a local sink due to the dewatering from mining in the Quarry and resulting head reversal from the Creek to the Quarry. That stretch of Permanente Creek is captured by the Quarry, which has been mapped and defined as part of prior investigations associated with the Reclamation Plan. Based on existing data, groundwater flow is preferentially within the more permeable limestone units; however, because the limestone units are of limited extent, the

overall basin-scale groundwater flow system is controlled by the lower permeability of the greenstone/graywacke units.

27. Recharge to the overall groundwater system is primarily by the infiltration of precipitation. The areas with flatter slopes or areas in topographic lows receive more uniform recharge, because runoff of rainfall is less than the runoff generated from the steeper slopes. Runoff from the steeper slopes can accumulate in topographically low spots, thereby focusing infiltration in these locations. Natural recharge to the Santa Clara Valley Groundwater Basin occurs primarily as infiltration from streams that exit the upland areas within the drainage basin onto the alluvium of the valley floor and from direct percolation of precipitation that falls on the valley floor. As noted below, the Santa Clara Valley Water District monitors municipal wells and has confirmed that drinking water has not been impacted by selenium, the primary COC identified at this Site.

28. The predominant drainage for the Site is Permanente Creek, which drains the vast majority of the developed portions of the Site. Permanente Creek is situated just south of the existing Site and is entrenched in limestone where it lies adjacent to the Quarry. To the west and east of the Quarry, Permanente Creek is mostly underlain by greenstone, greywacke, and undifferentiated Franciscan mélange. Permanente Creek is generally dry adjacent to the Quarry during the dry season, due to head reversal caused by mine dewatering. Otherwise, in the foothill reaches, Permanente Creek is a perennial stream that typically flows year-round both upstream of and downstream from the Quarry and is typically a gaining stream (i.e., baseflow from groundwater in the Creek sustains the perennial stream). In upland bedrock terrain such as this, the groundwater table mimics the topography with recharge in the uplands and sideslopes and discharge to drainage channels in the form of seeps, springs, and baseflow.

    Downstream, where Permanente Creek flows out onto the relatively flat alluvial plain of the Santa Clara Valley, and in particular near the mountain front where the alluvium is expected to be coarse-grained, the Creek becomes a losing stream and contributes recharge to the primary groundwater basins of the Valley. To the north of the WMSA and Quarry is Ohlone Creek, which is a tributary to the West Branch of Permanente Creek. Ohlone Creek flows intermittently, receiving overland runoff from north of the WMSA based on its current topography. Ohlone Creek runs parallel to Permanente Creek until it joins the West Branch of Permanente Creek and then Permanente Creek approximately one mile downstream from where Permanente Creek leaves the Site at the eastern edge of the property. An unnamed tributary to Permanente Creek is present just north of the EMSA, but south of the West Branch of Permanente Creek, near the Gate of Heaven cemetery. The unnamed tributary joins Permanente Creek just north of the Site after Permanente Creek makes its sharp bend to the northwest. Permanente Creek and the San Francisco Bay Estuary are currently listed as impaired due to selenium, which is identified as a COC at this Site. Permanente Creek and Stevens Creek are also listed as impaired due to toxicity, the cause of which is currently under investigation by Water Board staff working on the TMDL for selenium. It is mentioned here because a COC at the Site could be responsible.

29. The Site and surrounding foothills comprise the headlands of the Permanente Creek watershed. Permanente Creek flows for four miles along the south and east perimeter of the Site, with contributions from the West Branch of Permanente Creek tributary, Hale Creek tributary, and the unnamed creek that borders the north edge of the Site. Permanente Creek then flows approximately three more miles to the Stevens Creek Diversion channel where some or all of the flow in Permanente Creek can be diverted to Stevens Creek. Both Permanente and Stevens creeks ultimately discharge to the San Francisco Bay Estuary via either Permanente Creek (through Mountain View Slough) or Stevens Creek.

30. The regional climate is Mediterranean with the majority of precipitation occurring between November and April. Average annual precipitation is about 22 inches, consistent with the intermediate altitudes of the Santa Clara Valley, and more than 50 inches in the surrounding mountains. The climate is also temporally variable with dryer and wetter seasons from year to year. Groundwater recharge is estimated to range from about 2 to 6 inches per year based on previous work and average precipitation rates. This information is necessary to identify appropriate waste cover requirements as required by Provision 4 (Preliminary Closure Plans that include cover requirements for wastes disposed of in place, as is the current plan for the EMSA). It is potentially also useful to estimate potential loading (or flux) of COCs to groundwater and hydrogeologically-connected surface water, which is required by Provision 3. This is consistent with an Evaluation Monitoring Program, in accordance with Title 27 section 20385(a)(2).

Current Hydrogeological Conceptual Site Model and Monitoring Program

31. Geologic and hydrogeologic information for the Site was incorporated into a Conceptual Site Model (CSM) developed by the Dischargers in response to the June 26, 2013, requirement for a Hydrogeologic Characterization and Groundwater Investigation (Finding 17 in Regulatory History section). The Dischargers concluded that results of the investigation support their proposed CSM, in which groundwater flows primarily through weathered and fractured bedrock following historical topography and discharges primarily to surface waters that surround the Site. However, an update is necessary to ensure the subsurface is sufficiently characterized to predict and prevent deleterious impacts of reclamation, particularly backfilling the Quarry Pit with waste from the WMSA, as is currently proposed, and recognizing the complexity of characterizing groundwater flow through fractured bedrock. Provision 3 of these WDRs requires the Dischargers to develop a Self-Monitoring Program (SMP), including an update to the CSM.

32. Evaluations to date do not indicate drinking water impacts from the Site. No domestic water supply wells were identified within a two-mile radius of the Site in a search of the Groundwater Ambient Monitoring and Assessment Program (GAMA) database. The nearest water supply well is located more than two miles northeast of the Site. The Santa Clara Valley Water District monitors municipal wells and has confirmed that drinking water has not been impacted by selenium, which is the primary COC from the Site.

However, historical waste handling activities, including the disposal of mining waste, aluminum and magnesium foil manufacturing and research wastes, and potentially unknown wastes disposed of prior to Site regulation, and the current disposal of mining waste, have the potential to impact groundwater. The June 26, 2013, requirement included a hydrogeologic investigation (Finding 17 in Regulatory History section), with groundwater evaluated for a list of potential COCs that included inorganic (metals and metalloids, like selenium) and organic contaminants (including PCBs, VOCs, and petroleum hydrocarbons). Results of this investigation indicated that some metals are present at elevated concentrations, primarily in unfiltered groundwater samples (meaning they are attached to particles above 45um and may have limited mobility). Selenium concentrations are elevated in filtered and unfiltered samples (and selenium is therefore anticipated to be more mobile). In general, COC concentrations in groundwater decrease as groundwater moves from within, beneath, then away from the WMUs towards surface waters. This may be explained by attenuation of metals and metalloids via sorption and possibly precipitation as groundwater migrates through the subsurface.

Paired groundwater and surface water sampling locations suggest that groundwater containing elevated selenium may be discharging to Permanente Creek but at lower concentrations (and likely volumes) than observed in surface water discharges (as monitored by the NPDES and TMDL programs at the Water Board and Santa Clara County). Regardless, the contribution from groundwater may be significant. Provision 3 of these WDRs requires an estimate of loading (or flux) of COCs to groundwater and hydrogeologically-connected surface waters (including drinking water aquifers, if impacts are possible) as part of an SMP. This constitutes an Evaluation Monitoring Program, one of the three types of monitoring outlined in Title 27 section 20385:

a. Detection Monitoring: To identify (or detect) a release from a WMU, which will be required by the SMP;

b. Evaluation Monitoring: To investigate whenever there is evidence of a release from a WMU, which will also be required by the SMP due to elevated concentrations of COCs in groundwater at perimeter wells; and

c. Corrective Action Monitoring: To evaluate the efficacy of corrective actions taken when Evaluation Monitoring confirms a release from a WMU, which will be required at the Site if remediation is deemed necessary based on conclusions from Detection and Evaluation Monitoring.

33. Potential COCs from solid or liquid wastes listed in the historical documents and investigations summarized above include selenium and arsenic; mercury, cadmium, chromium, aluminum, nickel, copper, cobalt, vanadium, zinc, lead, and potentially other metals; petroleum hydrocarbons; chlorinated solvents such as tetrachloroethylene (PCE) and trichloroethylene (TCE); VOCs and SVOCs such as acetone, toluene, xylene, methylene chloride, and naphthalene; fluoride and cyanide from potliner waste; pesticides such as DDD and DDE; and salts (magnesium, chloride, sulfide, etc.) associated with brine. Most of these compounds have not been detected in Site groundwater; however, they may be present in the subsurface and

should therefore be considered COCs in the development of the SMP, as required by Provision 3.

34. The wastes characterized in these studies are classified as Group B mining wastes, as defined in Title 27 section 22480, because they "consist of or contain nonhazardous soluble pollutants of concentrations which exceed water quality objectives for, or could cause, degradation of waters of the State".

Waste Management Units (WMUs)

35. **Current WMUs:** The WMSA and EMSA (and the units buried beneath the EMSA) are classified as WMUs and regulated as such by these WDRs because they are temporary or permanent solid waste disposal units that have the potential to impact groundwater. In accordance with Title 27 section 22470 (a) and (b), extensive monitoring procedures will be required in lieu of siting, construction, liner, and leachate collection and removal system requirements for all WMUs, unless it is determined via the SMP that they are necessary to protect groundwater. Title 27 section 22490 (d) and (h) requires registered professionals to design and supervise construction of containment structures and specifies precipitation and drainage controls.

    a. West Materials Storage Area (WMSA): The WMSA is an approximate 172.6-acre area that stores approximately 48 million tons of wastes, primarily waste rock. However, fines from aggregate production (crushing of non-limestone materials mined from the Quarry Pit) were disposed of here when the Rock Plant was in operation. Cement kiln dust was reportedly disposed of in unspecified areas from 1950 to 1981, and kiln bricks may also be present. This disposal unit has been in operation since approximately 1903, and it is therefore anticipated that unknown wastes, possibly from former aluminum and magnesium manufacturing and research, may also be present within the waste mass. Waste characterization studies suggest that metals and metalloids are COCs; however, additional potential COCs remain a concern because comprehensive in situ evaluation of the waste was infeasible due to size/volume of the waste mass. Provision 3 of these WDRs requires monitoring of groundwater and hydrogeologically connected surface waters downgradient of the WMSA. Provision 7 requires submittal of an Operation, Maintenance, and Contingency Plan to ensure actions necessary to contain waste are being implemented. Provision 8 requires the Dischargers demonstrate the financial capability to close the Site in accordance with approved reclamation and closure plans; to monitor and maintain the Site after closure; and to implement corrective actions should waste migration be detected.

    The Dischargers plan to use wastes in the WMSA as backfill for the Quarry Pit to reclaim the Site. These WDRs include several requirements to address concerns about potential impacts to groundwater and hydrogeologically-connected surface waters in this process:

        i. Provision 4 requires Preliminary Closure Plans, which include characterization of wastes prior to disposal in the Quarry Pit, as well as an adequate evaluation regarding preventative measures necessary to immobilize COCs in the Quarry Pit

(for example, amendments to sorb reactive COCs or adjust geochemical conditions to prevent dissolution of COCs), should these methods be employed.

ii. Provision 3 requires the development of an SMP that expands the current groundwater monitoring network to include the entire perimeter of the Site, including the Quarry Pit. Monitoring must be conducted prior to reclamation to establish a baseline and to inform modelling/predictions with respect to waste or contaminant mobility associated with closure plans and activities.

iii. Provisions 5 and 6 require final Closure and Post-Closure Maintenance Plans and completion reports.

b. East Materials Storage Area (EMSA): The EMSA is an approximate 75.2-acre area that is designed to hold up to 6.5 million tons of wastes, primarily waste rock. However, fines from aggregate production are stored here as well. This disposal unit has been operating in its current capacity since approximately 2012. The EMSA overlies or is adjacent to several areas of concern as potential sources of contamination due to historic use and/or results of investigations. These include:

i. *Dry Canyon Storage Area (DCSA)*: The DCSA occupies approximately 0.6 acres and is now buried beneath the EMSA. This disposal unit contains concrete manufacturing and mining wastes. The general location of this and other former disposal units in the area was investigated in the 1990s, where elevated concentrations of PCBs, VOCs, total petroleum hydrocarbons (TPH), metals, and metalloids were found in some soil samples.

ii. *Former Surface Impoundment (FSI)*: The FSI occupies approximately 0.5 acres, and is also located beneath the EMSA. This disposal unit contains liquid and sludge wastes from cement manufacturing. The general location of this and other former disposal units in the area was investigated in the 1990s and was found to contain elevated concentrations of PCBs, TPH, metals, and metalloids in some soil samples.

iii. *Upper Level Landfill*: The dimensions of this unit, which is buried beneath the EMSA, are unknown. However, previous investigations have indicated various COCs, including acetone, chromium associated with the disposal of cement kiln bricks, metals associated with cement kiln dust, and TPH.

iv. *The Former Asphalt Plant Area*: Reportedly abandoned in the 1950s and buried beneath a landslide, this area was not investigated but may contain TPH.

v. *The Former Brine Pond*: The presence of a brine pond was reported in this general location but was not identified in previous investigations. COCs associated with this type of unit would typically be salts.

The above units are buried beneath the EMSA and are considered a potential threat only to groundwater as no other migration pathway is possible under the current land use and Site reclamation plans.

vi. *The Aluminum Plant Area*: This area contained mercury, TPH, and pesticides, but was addressed in 1990-91; its underground storage tanks were removed and closed in 1988.

Waste characterization studies suggest that metals and metalloids are COCs from the EMSA and the units beneath it; however, additional potential COCs remain a concern because comprehensive in situ evaluation of the waste was prohibited due to its size/volume. Groundwater monitoring conducted recently indicated localized impacts to groundwater from VOCs, SVOCs, and cyanide likely from the units beneath the EMSA but generally at concentrations below WQOs. These COCs are not observed in downgradient wells, suggesting that COCs may be relatively immobile; however, it is necessary for the Dischargers to ensure wastes are adequately isolated. Therefore, Provision 3 of these WDRs requires monitoring of groundwater and hydrogeologically-connected surface waters beneath and downgradient of the EMSA.

The Runoff and Seep investigation required in June 2013 described in the Regulatory History section confirmed that the EMSA is a source of inorganic COCs to stormwater and potentially groundwater. To address this, an interim cover is being installed of non-limestone waste material, which is expected to be of less concern than the limestone material with respect to selenium content and mobility. The Dischargers have completed vegetation studies to determine whether soil amendments are necessary to adequately revegetate and stabilize slopes. Final cover must sufficiently reduce not only selenium but other inorganic COCs in stormwater and groundwater.

Provision 4 requires a Preliminary Closure Plan that includes evaluation of the interim cover and proposed final cover. Provision 5 requires final Closure and Post-Closure Maintenance Plans and completion reports. A proposal, with supporting analysis, will be required for a final cover that protects human health and the environment. Models exist to adequately predict infiltration given site-specific climate, geologic, and hydrologic factors.

36. **Future WMUs**: As the Site is reclaimed, additional disposal units will become WMUs and be regulated by these WDRs. This includes the Quarry Pit and potentially onsite process wastewater and stormwater ponds currently regulated under an NPDES permit. Other areas of potential contamination identified in Site History and Potential Pollutant Source Identification Reports include the former Aluminum Plant Area that had a research building, an underground storage tank, and a substation; the current cement process area that formerly contained an emergency generator underground storage tank and service station; and the Rock Plant area that contains fill with cement kiln bricks and dust. The Aluminum Plant Area has been clean closed and the substation removed. Provision 4 requires Preliminary Closure Plans and Provision 5 final Closure and Post-Closure Maintenance Plans for disposal units that it is currently known will become WMUs, including the Quarry Pit. It is possible that additional future WMUs will be created or identified. Therefore, Provision 4 requires reporting of all historic, current, and planned future solid and liquid waste disposal units, to identify whether these units may require closure, which will also be addressed by Provision 5.

37. The above findings demonstrate the need for technical reports to ensure groundwater quality, and therefore human health and the environment, are protected from mining and reclamation activities. The burden, including costs, of the requirements bears a reasonable relationship with the need and benefits obtained.

BASIN PLAN

38. The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) is the Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives. The Basin Plan was duly adopted by the Water Board and approved by the State Water Board, the Office of Administrative Law, and U.S. EPA, where required.

ANTIDEGRADATION POLICY

39. Title 40 of the Code of Federal Regulations, part 131.12, requires that state water quality standards include an anti-degradation policy consistent with federal policy. The State Water Board established California's anti-degradation policy through State Water Board Resolution 68-16, which is deemed to incorporate the federal anti-degradation policy where the federal policy applies. Resolution 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal anti-degradation policies. This Order is consistent with both the State and federal anti-degradation policies because it does not allow degradation.

BENEFICIAL USES

40. The Order protects the following existing beneficial uses of Permanente Creek and Stevens Creek, tributaries to San Francisco Estuary (Bay), via Mountain View Slough:

    a. Fish spawning;
    b. Wildlife habitat;
    c. Water contact recreation;
    d. Non-contact water recreation;
    e. Industrial service supply;
    f. Ocean, commercial, and sport fishing;
    g. Estuarine habitat;
    h. Fish migration;
    i. Preservation of rare and endangered species;
    j. Cold freshwater habitat;
    k. Warm freshwater habitat;
    l. Navigation; and
    m. Groundwater recharge (Stevens Creek only).

41. The Order protects the following existing and potential beneficial uses of the groundwater in the Santa Clara sub-basin (Basin No. 2-9.02) of the Santa Clara Valley Groundwater Basin, which underlies the east portion of the Site and receives recharge from Site surface water drainages, including Permanente Creek:

    a. Municipal and domestic supply
    b. Industrial process and service supply, and
    c. Agricultural water supply.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

42. Adoption of this Order is exempt from CEQA pursuant to CEQA Guidelines sections 15061(b)(3) and 15306. CEQA applies only to projects that have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA. This Order requires the Dischargers to continue Site monitoring and maintenance activities, and these will not result in any additional actions that may have an effect on the environment beyond the existing baseline conditions. The CEQA Guidelines recognize that information collection does not result in a major disturbance to environmental resources. In addition, this action is an Order pertaining to an existing facility. There is no expansion of use beyond that existing under prior orders. For these reasons, the project is also exempt from the application of CEQA pursuant to CEQA Guidelines section 15301.

43. It is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This Order promotes that policy by requiring discharges to meet maximum contaminant levels designed to protect human health and ensure that water is safe for domestic use and by prohibiting discharges that cause or contribute to exceedances of maximum contaminant levels in receiving water.

NOTICE AND MEETING

44. The Water Board has notified the Dischargers and interested persons of its intent to issue WDRs for the Site and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

45. The Water Board, at a public meeting, heard and considered all comments pertaining to this issuance of WDRs for the Site.

IT IS HEREBY ORDERED pursuant to the authority in CWC sections 13263 and 13267 and Title 27 that the Dischargers shall meet the applicable provisions contained in Title 27 and shall comply with the following:

A. PROHIBITIONS

1. The treatment, discharge, or storage of waste or other materials that may impact the beneficial uses of groundwater or surface water shall not be allowed to create a condition of pollution, contamination or nuisance as defined in CWC section 13050, nor degrade the quality of waters of the State or of the United States.

2. Migration of pollutants through subsurface transport to waters of the State is prohibited.

3. There shall be no discharge of wastes to surface waters except as permitted under the Site's NPDES permits.

4. Excavation within or reconfiguration of any WMU is prohibited without prior concurrence of Water Board staff (for instance, via an acceptable Operation, Maintenance, and Contingency Plan as required by Provision 7). Minor excavation or reconfiguration activities, such as the installation of signs or minor routine maintenance and repair, do not require prior Water Board staff concurrence.

5. There shall be no discharges to an unregulated surface impoundment, and any residual liquids and sludge shall be removed expeditiously if it is determined that any surface impoundment is leaking or there is a failure that causes a threat to groundwater quality.

6. If it is determined that a WMU or surface impoundment is leaking or there is a failure that causes a threat to water quality, there shall be no discharges to that WMU or surface impoundment, and any residual liquids and sludge shall be removed expeditiously.

7. The creation of any new WMU is prohibited without prior Water Board amendment of these WDRs.

8. The relocation of wastes to or from WMUs is prohibited without prior Water Board staff written concurrence (for instance, via the Operation, Maintenance, and Contingency Plan required by Provision 7) and shall not create a condition of pollution or nuisance as defined in CWC section 13050(l) and (m). Wastes shall not be relocated to any location where they can be discharged into waters of the State or of the United States.

9. The discharge of hazardous waste at the Site is prohibited. For the purpose of this Order, the term "hazardous waste" is as defined in Title 27, section 20164.

10. The discharge of leachate or wastewater (including from surface impoundments, process waters, and runoff from the Site's operation areas) is prohibited, unless permitted under the Site's NPDES permit, where that leachate or wastewater:

a. Has the potential to cause corrosion or decay, or otherwise reduce or impair the integrity of the containment structures;

b. If mixed or commingled with other wastes in the unit, could produce a violent reaction including heat, pressure, fire, explosion, or the production of toxic by-products;

c. Requires a higher level of containment than provided by the unit; or

d. Is "restricted hazardous waste".

11. Activities associated with subsurface investigations and cleanup that will cause significant adverse migration of pollutants are prohibited.

12. Wastes shall not be disposed in any position where they may migrate from the disposal site to adjacent geologic materials, waters of the State, or waters of the United States during disposal operations, closure, and the post-closure maintenance period.

13. The Dischargers shall not cause the following conditions to exist in waters of the State at any place outside of the Site:

    a. **Surface Waters**

        i. Floating, suspended, or deposited macroscopic particulate matter or foam;

        ii. Bottom deposits or aquatic growth;

        iii. Adversely altered temperature, turbidity, or apparent color beyond natural background levels;

        iv. Visible, floating, suspended, or deposited oil or other products of petroleum origin; or

        v. Toxic or other deleterious substances to be present in concentrations or quantities that may cause deleterious effects on aquatic biota, wildlife, or waterfowl, or that render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentrations.

    b. **Groundwater**

        i. Degradation of groundwater quality; and

        ii. Subsurface migration of pollutants associated with the Dischargers' operations to waters of the State.

B. SPECIFICATIONS

1. The Dischargers shall comply with all applicable requirements of Title 27 that are not specifically referenced in this Order.

Reporting Specifications

2. All technical reports submitted pursuant to this Order shall be prepared under the supervision of and signed under penalty of perjury by a California registered civil engineer, registered geologist, and/or certified engineering geologist.

3. The Dischargers shall implement any Self-Monitoring Program (SMP) issued by the Executive Officer. The purpose of the SMP is to detect, at the earliest opportunity, any unauthorized discharge of waste constituents from surface impoundments or mining waste or any unreasonable impairment of beneficial uses associated with the Site's past or present activities.

4. The Dischargers shall manage WMUs to isolate wastes and wastewater from waters of the State and to prevent a statistically-significant monitoring parameter concentration from existing in the waters passing through points of compliance, as defined in Title 27, sections 20405 and 20420.

5. The existing containment, drainage, and monitoring systems at the Site shall be maintained for as long as the wastes and leachate pose a threat to water quality. The Dischargers shall continue the water quality monitoring program, pursuant to Title 27, section 20410, as long as the threat of a release from WMUs exists.

6. At any time, the Dischargers may file a written request (including supporting documentation) with the Executive Officer, proposing modifications to any SMP. If the proposed modifications are acceptable, the Executive Officer may issue a letter of approval that incorporates the proposed revisions into the SMP.

7. The Dischargers shall notify the Water Board immediately of any waste containment system failures occurring at the Site. Any failure that potentially compromises the integrity of containments structures shall be promptly corrected after approval of the method and schedule by the Executive Officer.

8. The Dischargers shall notify the Water Board at least 180 days prior to beginning any intermediate or final closure activities. This notice shall include a statement that all closure activities will conform to the most recently approved closure plan and that the plan provides for Site closure in compliance with all applicable regulations.

WMU Specifications

9. Closure of all WMUs shall be in compliance with the requirements of Title 27, section 21400.

10. If the Water Board determines that any WMU is polluting or threatening to pollute State waters, the Water Board may require the Dischargers to immediately cease the discharge.

11. Title 27, section 20310, requires that construction of new Class II surface impoundments be designed and constructed to prevent migration of wastewater from the impoundment to

adjacent geologic materials, groundwater, or surface water during operations, closure, and the post-closure maintenance periods.

12. As required by Title 27, section 20370 (seismic design), the Dischargers ensure that all WMU engineered structures (including, but not limited to, containment structures) shall have a foundation capable of: 1) providing support for the structures; 2) withstanding hydraulic pressure gradients; and 3) preventing failure due to settlement, compression, or uplift and all effects of ground motions including the maximum credible earthquake event.

13. New WMUs shall be designed, constructed, and operated to withstand ground accelerations associated with the maximum credible earthquake without damage to the foundation, the containment structures, or other structures which control wastewater, surface drainage, or erosion.

14. All new WMUs must isolate wastewater from waters of the State. In most cases, this is accomplished by a low permeability liner.

15. The Dischargers must isolate and contain all Class B mining wastes to prevent migration of COCs to adjacent geologic materials, groundwater, or surface water during operations, closure, and the post-closure maintenance periods. The containment systems must be designed to isolate leachate from the waters of the State. All containment structures must be maintained to preclude failure as a result of potential rapid geologic changes.

16. The Dischargers shall operate waste containment systems to prevent the migration of contamination. They shall be designed and operated to function without clogging and shall be inspected a minimum of three times per week when operating. The Dischargers shall operate and maintain WMUs according to a detailed operating, maintenance, and contingency plan, which will include at a minimum, procedures for routine inspections, investigations of the impact of any detected releases, and prompt notifications of agencies. Provision 7 of this Order requires the Dischargers to update the Site's Operation, Maintenance, and Contingency Plan for this purpose.

17. The Dischargers shall maintain final low-permeability caps over closed WMUs to minimize infiltration. Provisions 4 and 5 of this Order require that the Dischargers evaluate cover requirements to protect human health and the environment upon closure. The Site's Operation, Maintenance, and Contingency Plan, which includes requirements for maintenance of the mining waste WMUs, will be updated as disposal units are closed and WMUs are created.

18. WMUs at the Site shall be protected from any washout or erosion of wastes or covering material. Final cover systems for WMUs shall be graded and maintained to promote lateral runoff and prevent ponding and infiltration of water.

19. The Dischargers shall notify the Water Board immediately of any failure that threatens the integrity of any containment and/or control facilities, structures, or devices. Any such failure

shall be promptly corrected after approval of the method and schedule by the Executive Officer.

20. The Dischargers shall maintain the WMUs so as to prevent a statistically significant increase in water quality protection standards (WQPS) at points of compliance as provided in Title 27 and in any SMP.

21. The Dischargers shall have continuing responsibility for correcting any problems that arise in the future as a result of waste discharge or related operations or site use.

Monitoring Specifications

22. If the Executive Officer determines the existence of an imminent threat to the beneficial uses of surface or subsurface waters of the State, the Dischargers may be required to perform additional monitoring and/or undertake corrective action measures, including submittal of a site investigation report.

23. The Dischargers shall install, maintain in good working order, and operate efficiently any monitoring system necessary to assure compliance with these WDRs.

24. If it is determined by the Executive Officer that water quality at or beyond the point of compliance wells becomes degraded, the Dischargers will be required to submit and implement a site-specific groundwater corrective action proposal.

25. The Dischargers shall conduct monitoring activities according to the approved groundwater monitoring workplan from October 2014, until an SMP (as required by Provision 3) is submitted and approved. The Executive Officer may amend the SMP to verify the compliance of WMU with updated WQPS.

26. Any additional monitoring wells installed at the Site shall be constructed in a manner that maintains the integrity of the drill hole, prevents cross-contamination of saturated zones, and produces representative groundwater samples from discrete zones within the groundwater zone each well is intended to monitor.

27. All borings for monitoring wells shall be continuously cored unless prior concurrence of another boring/logging method is provided by Water Board staff. The drill holes shall be logged during drilling under the direct supervision of a California professional geologist whose signature appears on the corresponding well log. Logs of monitoring wells shall be filed with DWR and uploaded to GeoTracker. All information related to well construction shall be submitted to the Water Board upon well completion.

28. The groundwater sampling and analysis program shall ensure that groundwater quality data are representative of the groundwater in the area that is monitored.

29. All samples shall be analyzed by State-certified laboratories, or laboratories accepted by the Water Board, using approved U.S. EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control records for Water Board review. This provision does not apply to analyses that can only be reasonably performed onsite (e.g., pH). Exceptions may be made for atypical, but potentially useful methodologies, such as speciation analysis or sequential extraction.

Soil Contamination

30. The Dischargers shall notify the Water Board of any soil contamination not previously identified in subsurface investigations that is discovered during any subsurface investigation or excavation work conducted on the Site that may potentially adversely impact water quality.

C. PROVISIONS

1. **Compliance:** The Dischargers shall comply immediately, or as prescribed by the time schedule below, with all Prohibitions, Specifications, and Provisions of this Order. All required submittals must be acceptable to the Executive Officer. Violations may result in enforcement actions, including Water Board orders or court orders requiring corrective action or imposing civil monetary liability.

2. **Authority:** All technical and monitoring reports required by this Order are requested pursuant to CWC section 13267. Failure to submit reports in accordance with schedules established by this Order or failure to submit a report of sufficient technical quality to be acceptable to the Executive Officer may subject the Dischargers to enforcement action pursuant to CWC section 13268.

3. **Develop and Implement Self-Monitoring Program (SMP):** The Dischargers shall submit technical reports necessary to develop and implement a SMP to demonstrate that wastes are contained and groundwater and hydrogeologically-connected surface waters have not been and will not be impacted by the storage and disposal of wastes onsite. This SMP shall meet all requirements of a Detection Monitoring Program (DMP), pursuant to Title 27 section 20385, for groundwater beneath the Site as well as Evaluation Monitoring consistent with section 20385, where data indicates a release to groundwater has or is currently occurring. Specifically, the Dischargers shall submit:

   a. Conceptual Site Model (CSM) Update Workplan - A workplan, acceptable to the Executive Officer, to update the CSM to sufficiently characterize the subsurface of the Site, including groundwater flow directions and rates and potential receptors/exposure pathways. Characterization must be sufficient to predict and prevent deleterious impacts due to current mining operations as well as reclamation activities. An evaluation of potential impacts to surface water and drinking water must be included, including an estimate of loading of COCs to groundwater and hydrogeologically-connected surface waters.

      COMPLIANCE DATE: September 30, 2018

b. CSM Update Report and SMP Proposal – Submit a technical report that describes the results of the CSM update and uses this information to support a proposed SMP, acceptable to the Executive Officer, and, in accordance with Title 27 section 20385 through 20430, includes, at a minimum:

   i. A proposal for Water Quality Protection Standards, including a comprehensive list of COCs, regular Monitoring Parameters, and Concentration Limits, as defined by Title 27 section 20390;

   ii. A plan to monitor groundwater along the entire perimeter of the Site and downgradient of WMUs, as feasible, establishing monitoring points and points of compliance as defined by Title 27 section 20390. This will require defining the extent of waste;

   iii. A plan to monitor groundwater / surface water interaction;

   iv. A plan for facilities inspections for waste containment and monitoring facilities not covered under the Operation, Maintenance, and Contingency Plan (Provision 7); and

   v. A proposal for monitoring and reporting schedule, followed by immediate implementation, including at a minimum quarterly sampling and semi-annual reports, and confirming that the SMP will be implemented upon concurrence by Water Board staff.

   COMPLIANCE DATE: March 31, 2019 (or 6 months after Water Board staff concurrence with Workplan, whichever is later)

4. **Preliminary Closure Plans:** A Reclamation Plan was approved by Santa Clara County on January 7, 2012, in accordance with the Surface Mining and Reclamation Act. While reclamation and closure is not imminent, the Dischargers must ensure the approach (including reclamation implementation and methods) adequately protects water quality and complies with laws, policies, and regulations promulgated by the Water Board. The Dischargers are therefore required to submit preliminary closure plans, acceptable to the Executive Officer and updated periodically, that describe planned reclamation and closure methodologies and demonstrate that they will be adequately protective of water quality. The plans must include the following:

   a. A report and waste characterization of all historical, current, and future planned solid and liquid disposal units and a schedule of anticipated closure;

   b. A report detailing historical or ongoing reclamation activities;

   c. A description of planned or draft reclamation activities and closure methods, an evaluation of potential impacts to water quality, and an assessment of methods that could be employed to mitigate potential impacts or alternatives; and

   d. An evaluation of potential groundwater impacts from the interim cover currently installed on the EMSA.

The current reclamation plan proposes to cap the EMSA in place and use WMSA waste materials to backfill the Quarry Pit. If these (or similar) approaches are implemented, the following are also required:

e. Characterization of wastes that may be used for backfill of the Quarry Pit;

f. A proposal for final cover for the EMSA (and any waste materials that will remain at the surface post-closure) with a demonstration that impacts to surface and groundwater quality will be prevented; and

g. An evaluation of the Quarry Pit as a potential source of pollutants to groundwater and hydrogeologically-connected surface waters, including a fate and transport analysis of potential COCs, for example from any waste materials that may be proposed for use as fill. This evaluation shall also include an evaluation of potential methods to immobilize contaminants, if necessary.

The plans should include a proposal to model groundwater flow, surface water interaction, potential contaminant transport, and potential mitigation measures, as well as include results of a literature search to identify potentially applicable case studies for backfilling a Quarry Pit in proximity to a surface water body.

COMPLIANCE DATE: June 30, 2019 and updated every two years

5. **Closure and Post-Closure Maintenance Plans**: The Dischargers shall submit a Closure and Post-Closure Maintenance Plan for the closure of all current and future WMUs, acceptable to the Executive Officer, as outlined in Title 27, sections 21090-21200. This notice shall include a statement that all closure activities will conform to the most recently approved closure plan and that the plan provides for site closure in compliance with all applicable regulations.

   COMPLIANCE DATE: A minimum of:

   - **WMSA and Quarry Pit – 3 years prior to closure**
   - **EMSA – 2 years prior to closure**
   - **Other WMUs – 1 year prior to closure**

6. **Closure Completion Report**: A completion report, acceptable to the Executive Officer, shall be submitted within 60 days of closure to demonstrate the disposal unit was closed and reclaimed in accordance with approved plans and to confirm initiation of post-closure maintenance and monitoring.

   COMPLIANCE DATE: Within 60 days of closure of each unit

7. **Operation, Maintenance, and Contingency Plan**: The Dischargers shall develop, submit, and implement an Operation, Maintenance, and Contingency Plan, acceptable to the Executive Officer. The objectives are to demonstrate that quarrying and disposal activities are performed in a manner that is protective of State waters (including groundwater) and to demonstrate that waste containment infrastructure for all WMUs is being maintained and operated in a manner that will minimize the potential for discharge of wastes or waste contaminants to State waters. The Plan shall also identify what actions the Dischargers will take to respond to discharges to

waters of the State, such as a waste release from a mining waste containment unit. The Plan must include the following, at a minimum:

a. The scheduled periodic inspection and maintenance of waste containment features and monitoring infrastructure;

b. A contingency plan in the event of a release due to mining or disposal activities from any unit regulated by these WDRs, including plans for notification of agencies and actions required to initiate an investigation, if necessary; and

c. A description of operations that could that generate waste (solid and liquid) and a demonstration that State waters are being protected. This must include at a minimum the WMSA, EMSA, and the Quarry Pit, and includes permanent, semi-permanent, or temporary placement of fill or waste.

COMPLIANCE DATE: December 31, 2018, and updated every two years thereafter or whenever a new WMU is created (a disposal unit is closed)

8. **Financial Assurance**: In accordance with Title 27 section 22510(f), the Dischargers are required to provide adequate funding to pay for the costs of closure and post-closure maintenance. The Dischargers shall submit to the Water Board evidence of an irrevocable post-closure fund acceptable to the Executive Officer, to ensure monitoring, maintenance, and any necessary remediation actions for all wastes onsite with the potential to impact waters of the State that are regulated by these WDRs. Every five years, for the duration of the post-closure monitoring period, the Dischargers shall submit a report that includes an outline of the financial assurance mechanism and verification that the fund has been created. The fund value shall be supported by calculations, to be included with this submittal, providing cost estimates for all post-closure monitoring, maintenance, repair and replacement of WMU or waste containment, cover, and monitoring systems, including activities associated with monitoring and maintenance. The cost estimates and funding shall be updated to reflect change to monitoring systems as they occur. The post-closure maintenance period shall extend as long as the wastes within the WMU pose a threat to water quality.

   If a lead agency acting under the authority of section 2774(a) of the Public Resources Code requires assurances of financial responsibility, these assurances can be used to fulfill all comparable requirements, under certain circumstances outlined in Title 27 section 22510(g).

   Additionally, cost estimates must be provided for corrective action for known or reasonably foreseeable releases, consistent with contingency plans required in Provision 7. The fund value shall be based on the sum of these estimates.

COMPLIANCE DATE: October 15, 2018, and updated every five years with an annual update for inflation

9. **Change in Discharge:** In the event of a material change in the character, location, or volume of a discharge, the Dischargers shall file with the Water Board a new Report of Waste Discharge. A material change includes, but is not limited to, the following:

   a. Addition of a major industrial waste discharge to a discharge of essentially domestic sewage or the addition of a new process or product by an industrial facility resulting in a change in the character of the waste;

   b. Significant change in disposal method, e.g., change from a land disposal to a direct discharge to water or change in the method of treatment that would significantly alter the characteristics of the waste;

   c. Significant change in the disposal area, e.g., moving the discharge to another drainage area, to a different water body, or to a disposal area significantly removed from the original area, potentially causing different water quality or nuisance problems;

   d. Increase in flow to a WMU or water body beyond that specified in the WDRs; or

   e. Increase in area or depth to be used for solid or liquid waste disposal beyond that specified in the WDRs.

   COMPLIANCE DATE: 120 days prior to any material change

10. **Availability**: A copy of these WDRs shall be maintained by the Dischargers and shall be made available by the Dischargers to all employees or contractors performing work (maintenance, monitoring, repair, construction, etc.) at the WMUs.

11. **Notification for Projects that Might Impact Subsurface Mining Waste**: In the event of any proposed project the Dischargers become aware of that might disturb subsurface mining waste regulated by these WDRs or associated infrastructure, the Dischargers are required to notify the Water Board division responsible for the remediation project (currently, the Groundwater Protection Division). The notification must include the nature of the project and describe how mining waste or associated infrastructure could be impacted, contact information of project responsible parties, and a satellite image indicating the potentially affected area and property ownership information.

    COMPLIANCE DATE: 180 Days prior to project implementation (sooner is recommended to obtain Water Board staff input)

12. **Change in Ownership**: In the event of any change in control or ownership of the Site presently owned or controlled by the Dischargers, the Dischargers shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be forwarded to the Water Board upon a final change in ownership. To assume operation of this Order, the succeeding owner or operator must apply in writing to the Executive Officer within 30 days of the change of ownership. Any change in the Dischargers named on this Order requires an update or amendment to the WDRs by action of the Water Board. The request must contain the requesting entity's full legal name, mailing address, electronic address, and telephone

number of the persons responsible for contact with the Water Board. Failure to submit the request shall be considered a discharge without WDRs, a violation of CWC section 13260.

COMPLIANCE DATE: 30 days after a change in Site control or ownership

13. **Revision**: This Order is subject to Water Board review and updating, as necessary, to comply with changing State or federal laws, regulations, policies, or guidelines; changes in the Basin Plan; or changes in discharge characteristics. The Water Board will review this Order periodically and may revise its requirements when necessary.

14. **Submittal Revisions**: Where the Dischargers become aware that they failed to submit any relevant facts in a Report of Waste Discharge or submitted incorrect information in a Report of Waste Discharge or in any report to the Water Board, they shall promptly submit such facts or information.

15. **No Vested Rights**: This Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, do not protect the Dischargers from liability under federal, State, or local laws, nor do they create a vested right for the Dischargers to continue the waste discharge.

16. **Severability**: Provisions of these WDRs are severable. If any provisions of these requirements are found to be invalid, the remainder of these requirements shall not be affected.

17. **Operations and Maintenance**: The Dischargers shall, at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Dischargers to achieve compliance with conditions of this Order. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Order.

18. **Reporting Requirements**: All reports submitted pursuant to this Order must be in accordance with the State Water Board-adopted regulations requiring electronic report and data submittal to the State's GeoTracker database (CCR Title 23, §§3890-3895). Email notification should be provided to Water Board staff whenever a file is uploaded to GeoTracker. In addition, the Dischargers shall submit hard copies of reports to Water Board staff, if requested. The Dischargers are responsible for submitting the following via GeoTracker:

    a. All chemical analytical results for soil, water, and vapor samples;

    b. The latitude and longitude of any sampling point for which data is reported, accurate to within 1 meter and referenced to a minimum of two reference points from the California Spatial Reference System, if available, unless specified in the SMP;

    c. The surveyed elevation relative to a geodetic datum of any permanent sampling point;

d. The elevation of groundwater in any permanent monitoring well relative to the surveyed elevations;

e. A site map or maps showing the location of all sampling points;

f. The depth of the sampling point or depth and length of screened interval for any permanent monitoring well;

g. PDF copies of boring logs; and

h. PDF copies of all reports, workplans, and other documents (the document, in its entirety [signature pages, text, figures, tables, etc.] must be saved to a single PDF file) including the signed transmittal letter and professional certification by a California professional civil engineer or a professional geologist.

19. Upon request, monitoring results shall also be provided electronically in Microsoft Excel® to allow for ease of review of site data and to facilitate data computations and/or plotting that Water Board staff may undertake during the review process. Electronic tables shall include the following information:

    a. Well designations;

    b. Well location coordinates (latitude and longitude);

    c. Well construction (including top of well casing elevation, total well depth, screen interval depth below ground surface, screen interval elevation, and a characterization of geology of subsurface the well is located in);

    d. Groundwater depths and elevations (water levels);

    e. Current analytical results by constituent of concern (including detection limits for each constituent);

    f. Historical analytical results (including the past five years unless otherwise requested); and

    g. Measurement dates.

20. **Reporting of Hazardous Substances Release**: If any hazardous substance is discharged in or on any waters of the State, or discharged or deposited where it probably will be discharged in or on any waters of the State, the Dischargers shall:

    a. Report such discharge, as soon as it is safe to do so, to the following:

        i. The Water Board by calling (510) 622-2369 during regular office hours (Monday through Friday, 8 a.m. – 5 p.m.); and

        ii. The California Office of Emergency Services (Cal OES) at (800) 852-7550.

    b. A written report shall be filed with the Water Board within five working days. The report shall describe:

        i. The nature of the waste or pollutant;

        ii. The estimated quantity involved;

iii. The duration of the incident;

iv. The cause of the release;

v. The estimated size of the affected area, and nature of the effect;

vi. The corrective actions taken or planned and a schedule of those measures; and

vii. The persons/agencies notified.

This reporting is in addition to reporting to Cal OES as required by the Health and Safety Code.

21. **Reporting Releases to Cal OES**: Except for a discharge that is in compliance with these WDRs, any person who, without regard to intent or negligence, causes or permits any hazardous substance or sewage to be discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, shall immediately notify Cal OES of the discharge in accordance with the spill reporting provision of the State toxic disaster contingency plan adopted pursuant to Article 3.7 (commencing with section 8574.7) of the Government Code and immediately notify the Water Board of the discharge as soon as:

    a. That person has knowledge of the discharge;

    b. Notification is possible; and

    c. Notification can be provided without substantially impeding cleanup or other emergency measures.

    This provision does not require reporting of any discharge of less than a reportable quantity as provided for under subdivisions (f) and (g) of CWC section 13271 unless the Dischargers are in violation of a prohibition in the Basin Plan.

22. **Release Reporting Requirements to Water Board**: In the case of a release (as defined in Provision 20), the following must be provided to the Water Board within five days of knowledge of the release:

    a. Site map illustrating location and approximate size of impacted area;

    b. Photographs of the impacted area before and after remediation; and

    c. A report detailing the remediation method chosen and its efficacy and illustrating that the release contingency plan was effective, or else proposing modifications to the contingency plan to increase its effectiveness.

23. **Endangerment of Health or the Environment**: The Dischargers shall report any noncompliance that may endanger human health or the environment. Any such information shall be provided orally to the Executive Officer, or authorized representative, **within 24 hours** from the time the Dischargers become aware of the circumstances. A written submission

shall also be provided within five days of the time the Dischargers become aware of the circumstances. The written submission shall contain:

a. A description of the noncompliance, and its cause;

b. The period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected; and

c. The anticipated time it is expected to continue and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

The Executive Officer, or an authorized representative, may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

24. The Dischargers shall immediately notify the Water Board and the Local Enforcement Agency if additional groundwater contamination or potential contamination is detected. The Dischargers shall immediately initiate corrective action to stop and contain the migration of pollutants from the surface impoundment or mining waste.

25. The Dischargers shall notify the Water Board of any previously unknown soil or groundwater contamination discovered during any subsurface investigations conducted at the Site, which may potentially have an adverse impact on ground or surface waters.

26. **Entry and Inspection**: The Dischargers shall allow Water Board staff, or an authorized representative upon the presentation of credentials and other documents as may be required by law, to:

    a. Enter upon the Dischargers' premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Order;

    b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order;

    c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and

    d. Sample or monitor at reasonable times, for the purposes of assuring compliance with this order or as otherwise authorized by the CWC, any substances or parameters at any location.

27. **Discharges to Navigable Waters**: Any person discharging or proposing to discharge to navigable waters from a point source (except for discharge of dredged or fill material subject to §404 of the federal Clean Water Act and discharge subject to a general NPDES permit) must file an NPDES permit application with the Water Board (40 Code of Federal Regulations or CFR §122.21).

28. **Monitoring Devices**: All monitoring instruments and devices used by the Dischargers to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy.

Unless otherwise permitted by the Executive Officer, all analyses shall be conducted at a laboratory certified for such analyses by the State Water Board's Division of Drinking Water. The Executive Officer may allow use of an uncertified laboratory under exceptional circumstances, such as when the closest laboratory to the monitoring location is outside State boundaries and therefore not subject to certification. All analyses shall be required to be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants" (40 CFR Part 136) promulgated by U.S. EPA.

29. **Treatment**: In an enforcement action, it shall not be a defense for the Dischargers that it would have been necessary to halt or to reduce the permitted activity in order to maintain compliance with this Order. Upon reduction, loss, or failure of the treatment facility, the Dischargers shall, to the extent necessary to maintain compliance with this Order, control production or all discharges, or both, until the facility is restored or an alternative method of treatment is provided. This provision applies, for example, when the primary source of power of the treatment facility fails, is reduced, or is lost.

30. **Document Distribution**: Copies of correspondence, technical reports, and other documents pertaining to compliance with this Order shall be provided to the Water Board and any other interested agencies.

31. **General Prohibition**: Neither the treatment nor the discharge of waste shall create a pollution, contamination, or nuisance, as defined by CWC §13050, CWC §13263, and Cal. Health & Safety Code §5411.

32. The Dischargers shall remove and relocate any wastes that are discharged at this Site in violation of these WDRs.

33. The Dischargers shall immediately notify the Water Board of any flooding, equipment failure, slope failure, or other change in Site conditions that could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures. Any such failure shall be promptly corrected after approval of the method and schedule by the Executive Officer.

34. **Earthquake Inspection**: The Dischargers shall submit a detailed Post Earthquake Inspection Report, acceptable to the Executive Officer, in the event of any earthquake generating ground shaking of Richter Magnitude 6.5 or greater at or within 30 miles of the Site. The report shall describe the containment features, groundwater monitoring, and control facilities potentially impacted by the static and seismic deformations of any WMU or waste containment system. Damage that may result in discharge or threatened discharge to State waters must be reported immediately to the Executive Officer.

COMPLIANCE DATE: Verbally as soon as the data becomes available and in writing within two weeks of a triggering seismic event. Any damage that may cause negative impacts to waters of the State must be reported immediately upon discovery to the Water Board's Spill Hotline at (510) 622-2369 and by sending an email to Rb2SpillReports@waterboards.ca.gov. In addition, report to Cal OES at (800) 852-7550.

35. **Maintenance of Records**: The Dischargers shall retain records of all monitoring information including all calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this order. Records shall be maintained for a minimum of five years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Executive Officer. Records of monitoring information shall include:

    a. The date, exact place, and time of sampling or measurements;
    b. The individuals who performed the sampling or measurements;
    c. The date(s) analyses were performed;
    d. The individuals who performed the analyses;
    e. The analytical techniques or method used; and
    f. The results of such analyses.

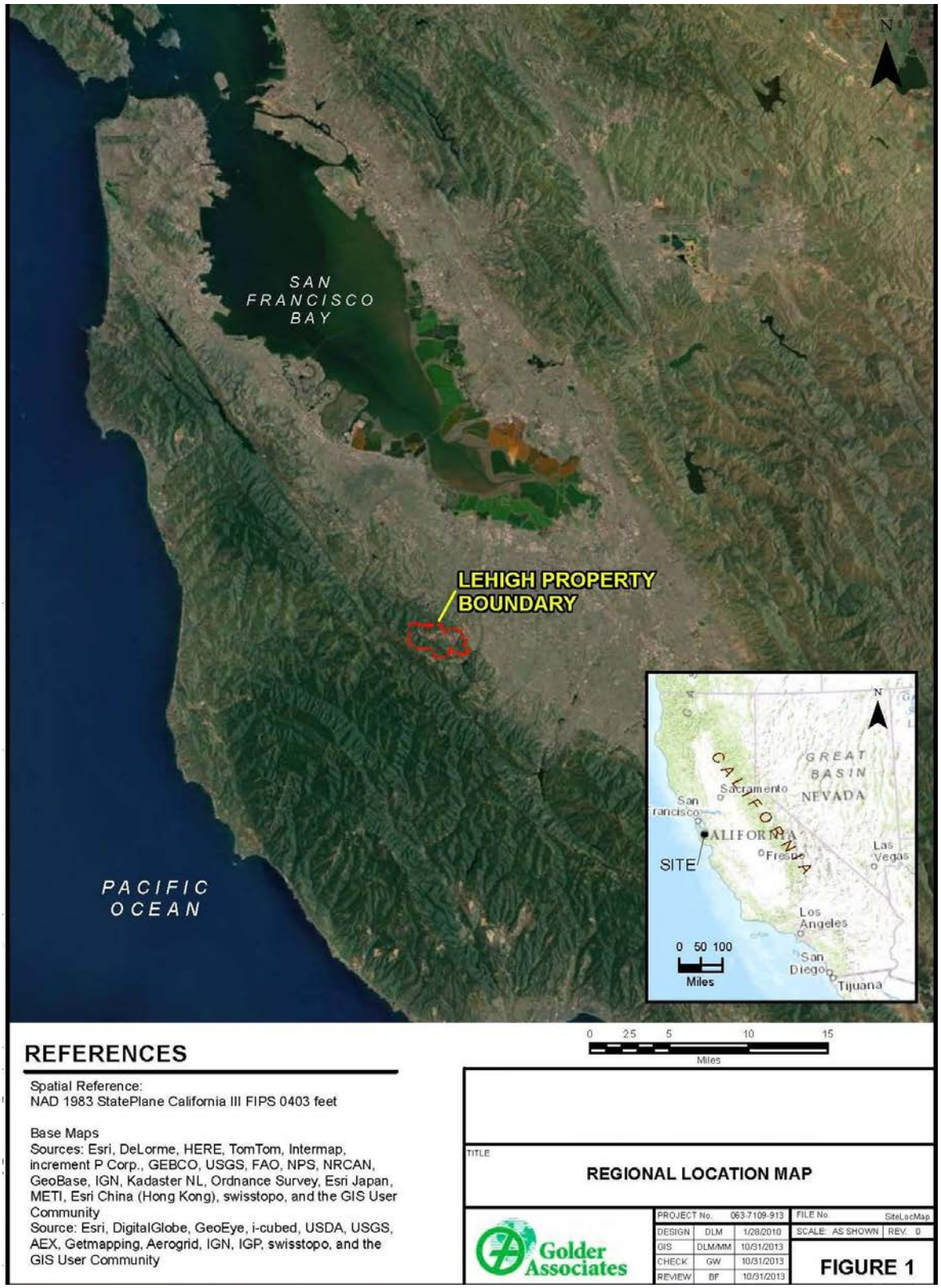
36. This Order is subject to Water Board review and updating, as necessary, to comply with changing State or federal laws, regulations or policies, or guidelines; changes in the Water Board's Basin Plan; or changes in discharge characteristics.

I, Bruce H. Wolfe, Executive Officer, do hereby certify that the foregoing is a full, complete, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on June 13, 2018.

_____
Bruce H. Wolfe
Executive Officer

Attachments:

Figure 1 - Site Location
Figure 2 - Site Plan
Figure 3 – Current Groundwater Monitoring Well Network
Figure 4 – Site Geology


N
SAN FRANCISCO BAY
LEHIGH PROPERTY BOUNDARY
PACIFIC OCEAN
N
GREAT BASIN
CALIFORNIA
NEVADA
Sacramento
San Francisco
SITE
Fresno
Las Vegas
Los Angeles
San Diego
Tijuana
0 50 100
Miles
0 2.5 5 10 15
Miles
REFERENCES
Spatial Reference:
NAD 1983 StatePlane California III FIPS 0403 feet
Base Maps
Sources: Esri, DeLorme, HERE, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
TITLE
REGIONAL LOCATION MAP
Golder Associates
PROJECT No. 063-7109-913
FILE No. SiteLocMap
DESIGN DLM 1/28/2010
SCALE: AS SHOWN REV: 0
GIS DLM/MM 10/31/2013
CHECK GW 10/31/2013
REVIEW BF 10/31/2013
FIGURE 1

LEGEND

- Stream
- Ponds (Ponds 1, 4a, 11, 17, 20, 1250 are lined)
- Property Boundary
- Area outline (Approximate)
- Former Aluminum Plant/Research Building Area (clean closed 1991, Peregren Environmental Group)

Potential Areas of Concern:

1) Former Dry Canyon Storage Area
2) Former Upper Landfill Area
3) Former Asphalt Plant Area
4) Former Brine Pond
5) Former Surface Impoundment

NOTES

1) Locations based on conversion from local coordinates or Google Earth placement.

REFERENCES

1)Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
2) Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
3) Potential Areas of Concern locations are based on Figure 2 from EMCON's Environmental Evaluation Report, Kaiser Aluminum & Chemical Corporation Permanente Facility, 1993.
4) February 13, 1991, "Cleanup and Facility Decommissioning Report for Kaiser Aluminum and Chemical Corporation 23333 Stevens Creek Boulevard, Cupertino, California, Peregren Environmental Group

1,200 0 1,200
Feet

PROJECT

PERMANENTE QUARRY
SANTA CLARA COUNTY, CALIFORNIA

TITLE

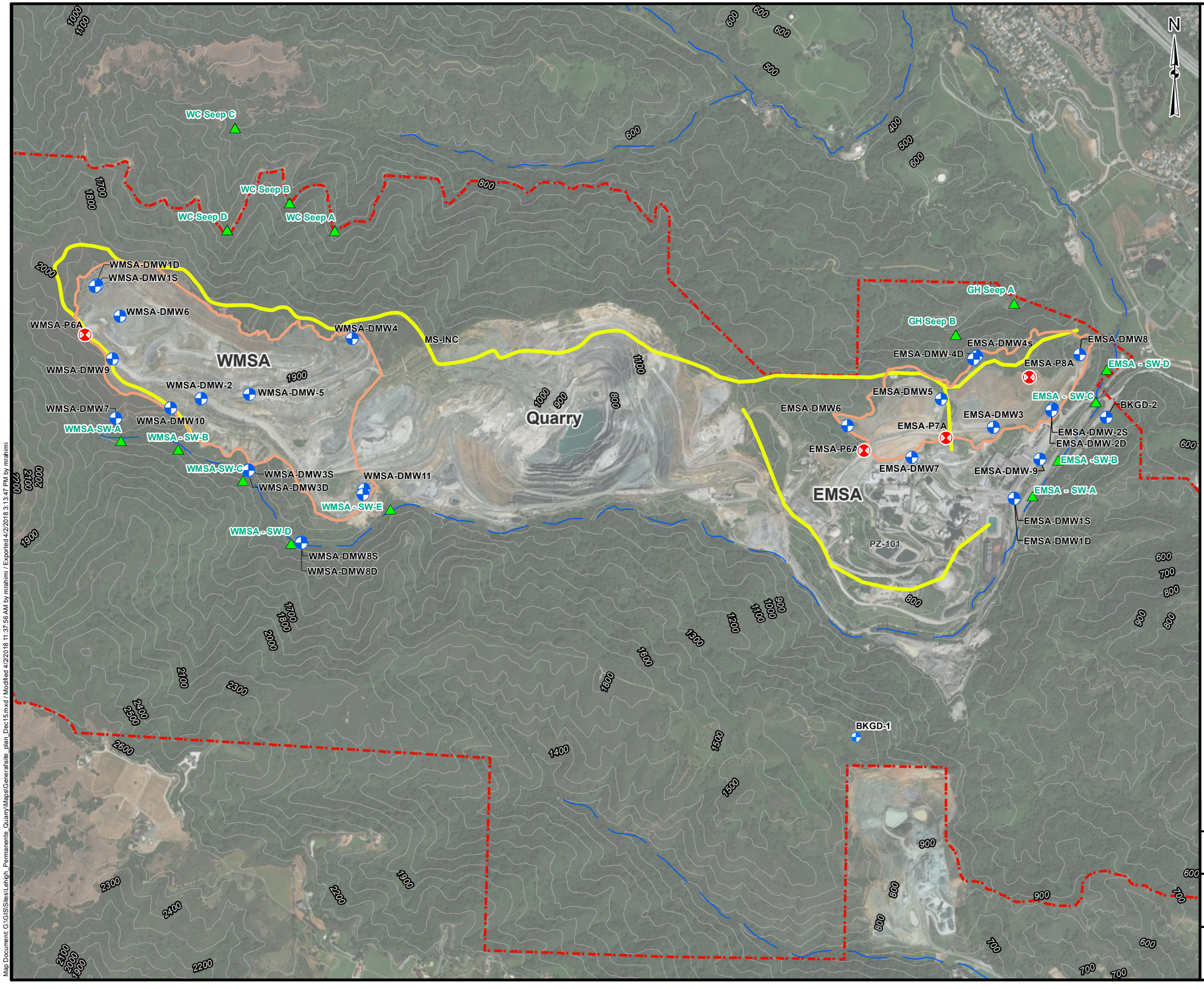
SITE OVERVIEW

GOLDER

PROJECT No.		063-7109	FILE No.		SitePlan.mxd
DESIGN	DZF	10/31/2013	SCALE:	AS SHOWN	REV. 0
GIS	DZF	4/17/2018			
CHECK	GW	4/17/2018			
REVIEW	GW	4/17/2018			

FIGURE 2

Map Document: G:\GIS\Sites\Lehigh_Permanente_Quarry\Maps\General\SitePlan.mxd / Modified 4/17/2018 11:45:22 AM by mrahimi / Exported 4/17/2018 11:54:59 AM by mrahimi



LEGEND

Well Type

- Monitoring Well
- Piezometer
- Seep and Surface Water Sample Location
- 100 ft surface elevation contour
- Former Ridgecrest
- Property Boundary
- EMSA/WMSA Boundary (Approximate)

REFERENCES

1) USGS 1/9th Arc NED DEM based off of 2006 LIDAR Survey
2) Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3) Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
4) Former Ridgecrest created from 1952 Cupertino and 1955 Mindego Hills Quadrangle USGS Topographic Maps.

1,200 0 1,200 Feet

1 in = 1,300 feet

PROJECT

PERMANENTE QUARRY
SANTA CLARA COUNTY, CA

TITLE

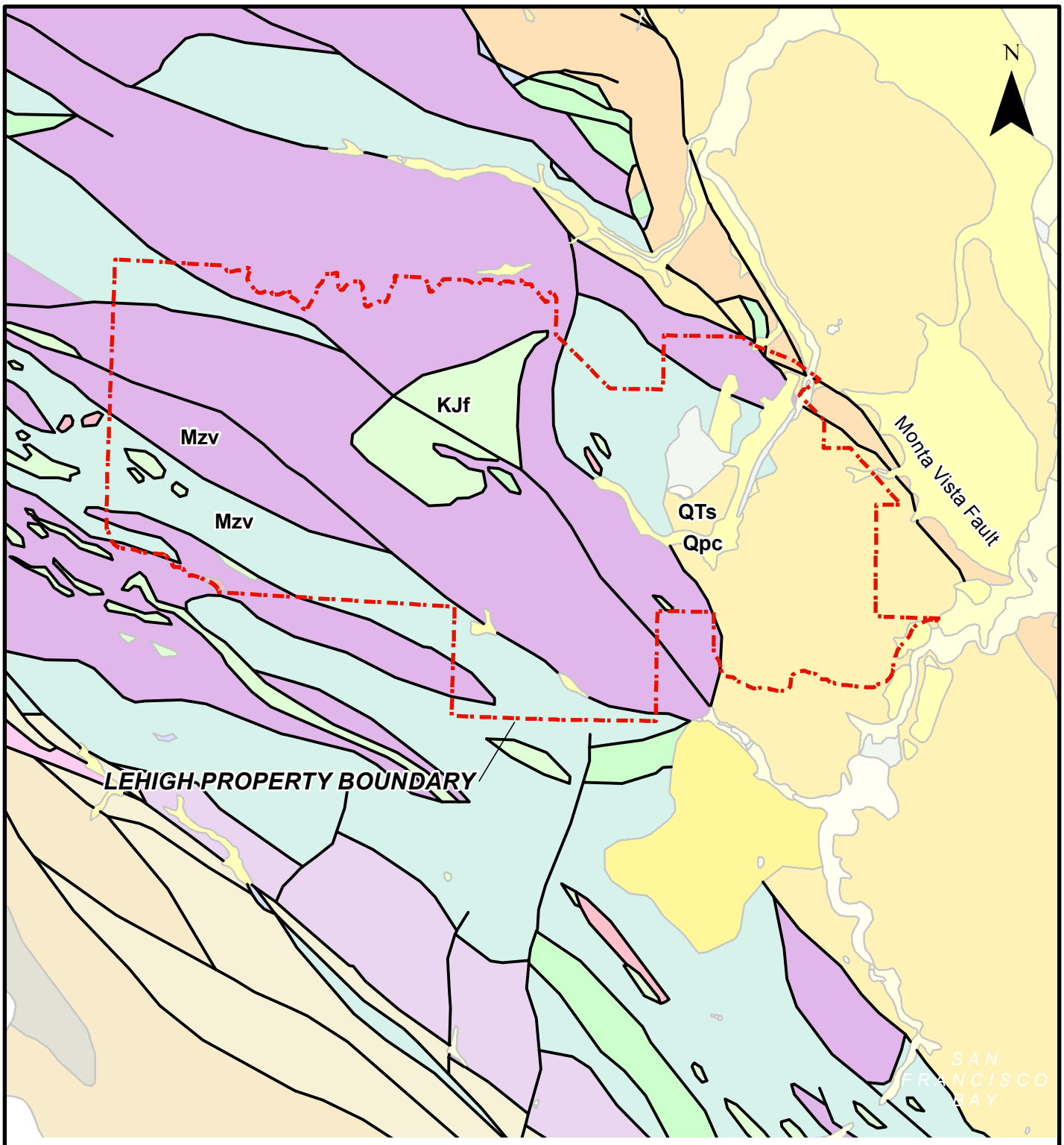
SITE PLAN

GOLDER

PROJECT No.	063-7109-914		FILE No.	site_plan_Dec15.mxd
DESIGN	MM	4/2/2013	SCALE: 1:15,600	REV. 0
GIS	MR	4/2/2018		
CHECK	GW	4/2/2018		
REVIEW	GW	4/2/2018		

FIGURE 3

Map Document: G:\GIS\Sites\Lehigh_Permanente_Quarry\Maps\General\site_plan_Dec15.mxd / Modified 4/2/2018 11:37:56 AM by mrahimi / Exported 4/2/2018 3:13:47 PM by mrahimi



0 0.5 1
Miles

REFERENCES

US Geological Survey, Geologic Map and Map Database of the Palo Alto 30' x 60' Quadrangle, California; Brabb, E.E., R.W.Graymer, and D.L., Jones, 2000. MF Studies Map MF-2332.
(http://pubs.usgs.gov/mf/2000/mf-2332/mf2332m.pdf)

PROJECT

PERMANENTE QUARRY
SANTA CLARA COUNTY, CALIFORNIA

TITLE

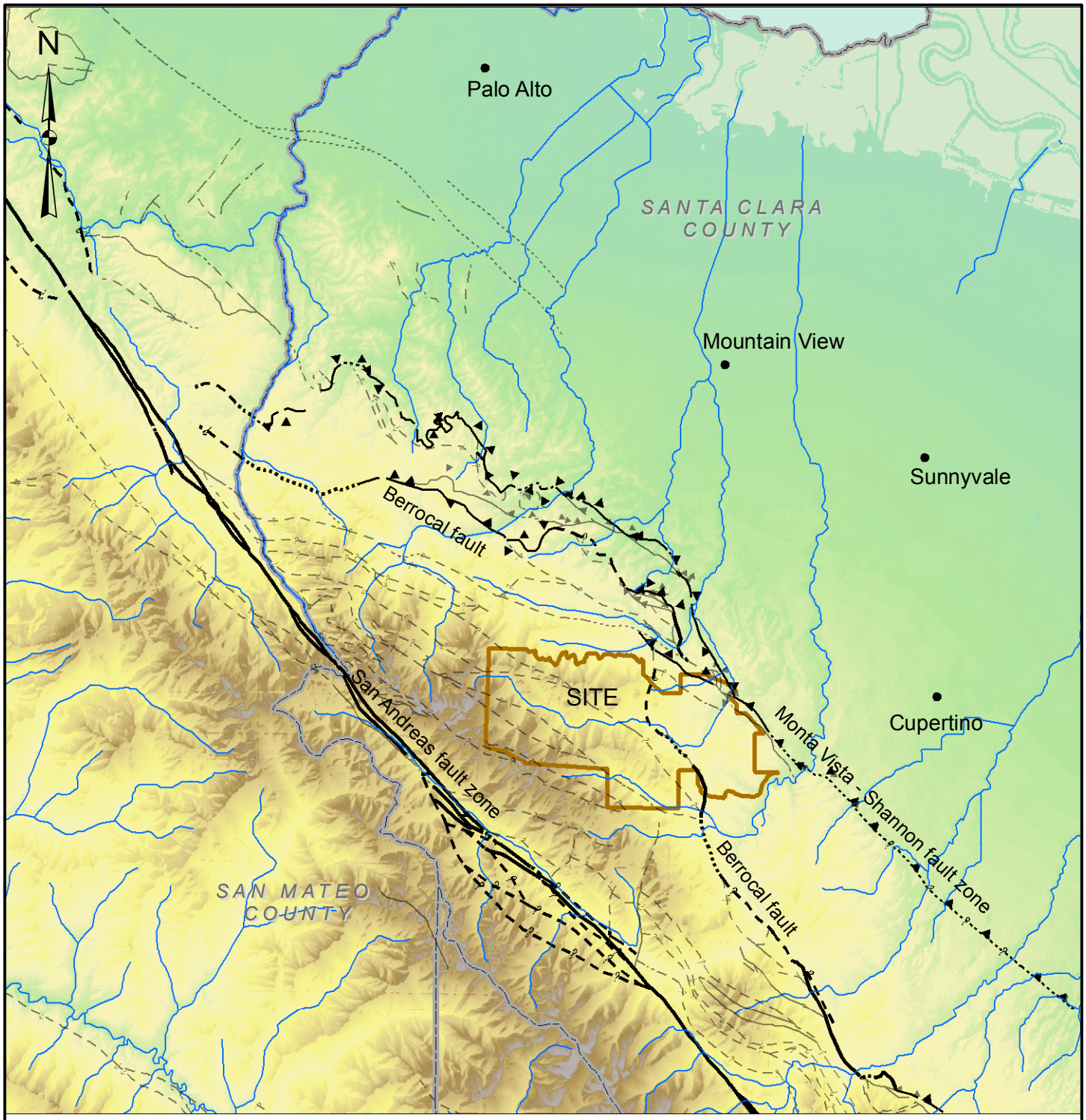
REGIONAL GEOLOGIC MAP

GOLDER

PROJECT No.		063-7109	FILE No.	
DESIGN	MR	04/03/2018	SCALE: AS SHOWN	REV. 0
GIS	MR	04/03/2018		
CHECK	GW	04/03/2018		
REVIEW	WLF	04/03/2018		

FIGURE 4

Map Document: G:\GIS\Sites\Lehigh_Permanente_Quarry\Maps\General\H_Regional\GeologicMap.mxd / Modified 4/3/2018 10:11:39 AM by mrahimi / Exported 4/3/2018 10:11:47 AM by mrahimi



Legend

- Stream
- *Fault (surface expression):*
- Certain
- Concealed
- Inferred
- Thrust (teeth in dip direction)

Dashed where approx., querried where uncertain; dotted where concealed.

Fault source: Brabb, et. al. (2000)
Faults discussed in text have heavier line weight.

PROJECT

PERMANENTE QUARRY
SANTA CLARA COUNTY, CA

TITLE

REGIONAL GEOTECTONIC SETTING

GOLDER
Sunnyvale, CA

PROJECT No.		063-7109	FILE No.
DESIGN	MR	4/02/2018	SCALE: AS SHOWN REV. 0
GIS	MR	4/02/2018	
CHECK	GW	4/02/2018	**FIGURE 5**
REVIEW	GW	4/02/2018	

G:\Projects\063-7109 (Hanson Permanente Quarry\GIS\Hanson_geotectonic_map_20Mar2009.mxd

WC Seep D
WC Seep A
N
WMSA-DMW-1D
(1742.22)
WMSA-DMW-1S
(1739.23)
1800
WMSA-DMW-6
(1644.38)
WMSA-P6A
(1855.32)
WMSA-DMW-4
(1771.66)
MS-INC
WMSA-DMW-9
(1793.65)
1700
1600
WMSA-DMW-2
(1479)
WMSA-DMW-5
(1522.09)
1500
WMSA-DMW-7
(1568.54)
WMSA-DMW-10
(1556.36)
WMSA-SW-A
WMSA - SW-B
1400
WMSA-SW-C
WMSA-DMW-3D
(1356.71)
WMSA-DMW-3S
(1366.87)
WMSA-DMW-11
(1400.94)
WMSA - SW-E
WMSA-DMW-8D
(1283.54)
1300
WMSA-DMW-8S
(1283.83)
WMSA - SW-D

LEGEND

Well Type

- Monitoring Well
- Piezometer
- VWT Piezometer
- Surface Water Sample Location
- Groundwater elevation Contour (03/2017)
- Former Ridgecrest
- Property Boundary
- EMSA/WMSA outline

NOTES

- Deep groundwater monitoring wells not used in contouring.

REFERENCES

1) USGS 1/9th Arc NED DEM based off of 2006 LIDAR Survey
2) Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3) Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
4) Former Ridgecrest created from 1952 Cupertino and 1955 Mindego Hills Quadrangle USGS Topographic Maps.

500 0 500 Feet
1 in = 524 feet

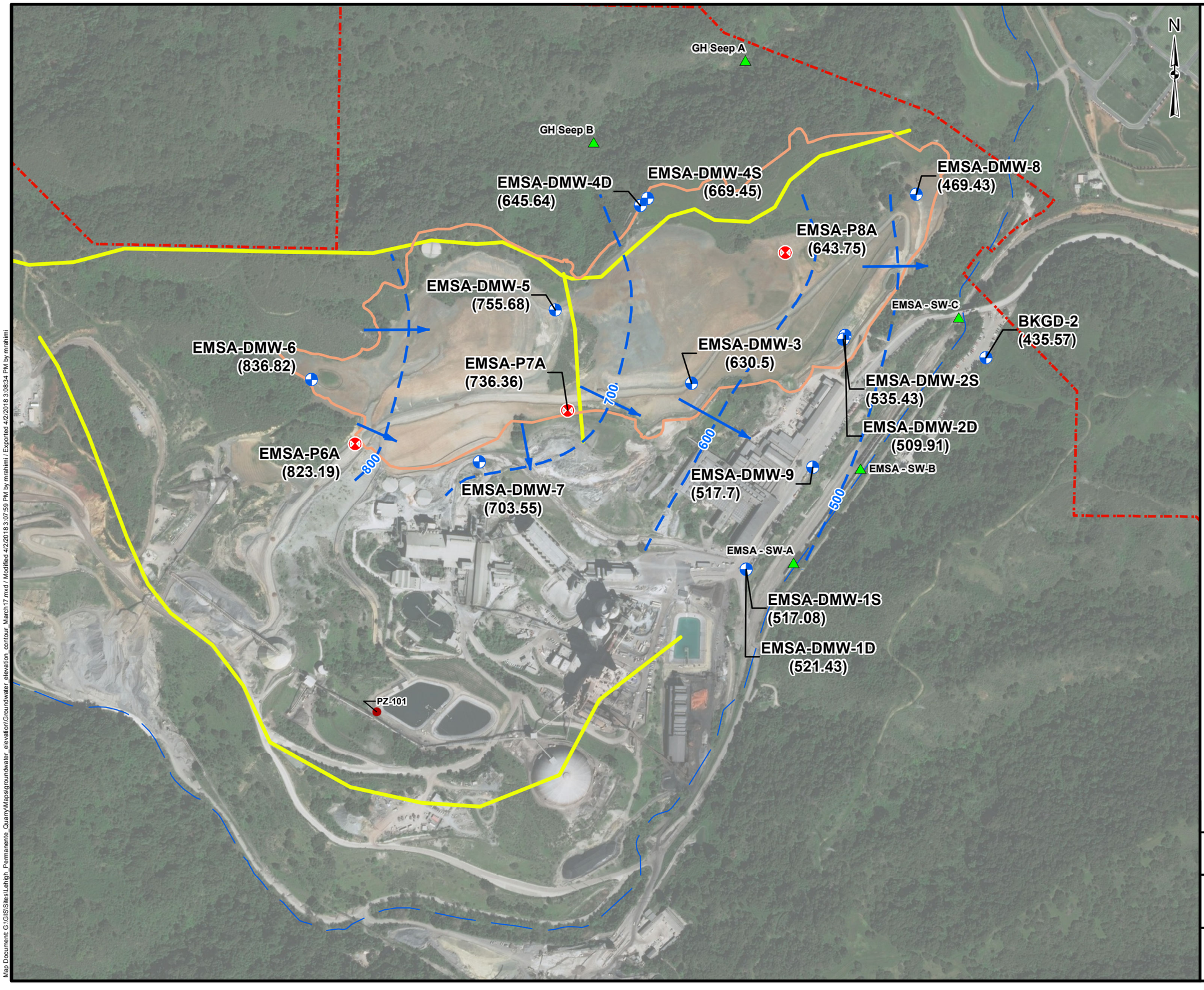
PROJECT
PERMANENTE QUARRY
SANTA CLARA COUNTY, CA

TITLE
WMSA GROUND WATER ELEVATION CONTOUR MARCH 2017

GOLDER

PROJECT No.	063-7109-914		FILE No.	Groundwater_elevation_contour_March17.mxd
DESIGN	MM	4/2/2013	SCALE: 1:6,290	REV. 0
GIS	MR	4/2/2018		
CHECK	GW	4/2/2018	**FIGURE 6**	
REVIEW	GW	4/2/2018		

Map Document: G:\GIS\Sites\Lehigh_Permanente_Quarry\Maps\groundwater_elevation\Groundwater_elevation_contour_March17.mxd / Modified 4/2/2018 3:07:59 PM by mrahimi / Exported 4/2/2018 3:09:11 PM by mrahimi



Map Document: G:\GIS\Sites\Lehigh_Permanente_Quarry\Maps\groundwater_elevation\Groundwater_elevation_contour_March17.mxd / Modified 4/2/2018 3:07:59 PM by mrahimi / Exported 4/2/2018 3:08:34 PM by mrahimi

LEGEND

Well Type

- Monitoring Well
- Piezometer
- VWT Piezometer
- Surface Water Sample Location
- Groundwater elevation Contour (03/2017)
- Former Ridgecrest
- Property Boundary
- EMSA/WMSA outline

NOTES

- Deep groundwater monitoring wells not used in contouring.

REFERENCES

1) USGS 1/9th Arc NED DEM based off of 2006 LIDAR Survey
2) Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3) Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
4) Former Ridgecrest created from 1952 Cupertino and 1955 Mindego Hills Quadrangle USGS Topographic Maps.

500 0 500 Feet

1 in = 499 feet

PROJECT

PERMANENTE QUARRY
SANTA CLARA COUNTY, CA

TITLE

EMSA GROUND WATER ELEVATION CONTOUR MARCH 2017

GOLDER

PROJECT No.	063-7109-914		FILE No.	Groundwater_elevation_contour_March17.mxd
DESIGN	MM	4/2/2013	SCALE: 1:5,990	REV. 0
GIS	MR	4/2/2018		
CHECK	GW	4/2/2018		
REVIEW	GW	4/2/2018		

FIGURE 7

APPENDIX A

Regulatory History Outside the Scope of these WDRs

1. **Santa Clara County Regulation:** Santa Clara County regulates the Site under the Surface Mining and Reclamation Act (SMARA) under the oversight of the California Department of Conservation's Office of Mine Reclamation (Mine ID# 91-43-0004). The County also regulates the Site under the Department of Environmental Health Hazardous Materials Program and Local Oversight Programs.

2. **Water Reclamation Requirements:** Water Board Order No. 94-038 was adopted for Kaiser Cement Corporation, permitting the use of reclaimed water from the Wastewater Treatment Facility. Order No. 94-038 allows treated and disinfected sewage to be reused in the cement manufacturing processes and for dust compaction.

3. **Treated Wastewater and Stormwater Discharges:** Stormwater discharges at the Site have been regulated by the Water Board since August 1974, when Kaiser Cement and Gypsum Corporation was issued Waste Discharge Requirements Order No. 74-65, which was rescinded by Order No. 97-061 when the Site obtained coverage under the State Water Board's General Permit for Stormwater Discharges Associated with Industrial Activity (Industrial General Permit). General stormwater permits are standard for quarry sites; however in 2012, Water Board staff began developing individual NPDES permits for the Site's surface water discharges, due to the identification of constituents of concern beyond those typical for quarries, chiefly selenium.

   The Site's mining and cement manufacturing process water and stormwater discharges are regulated under NPDES Permit CA0030210, Order No. R2-2014-0010, which was amended in July 2017 by Order No. R2-2017-0030. Industrial process water from cement manufacturing and stormwater from process and storage areas (including seepage collected from the EMSA from a french drain) are collected, reused, and/or treated for selenium, metals, suspended solids and pH by the Upper Final Treatment System (formerly the pilot treatment system) and discharged to Permanente Creek. The Lower Final Treatment System, which is under construction as of the date of this Order, is anticipated to treat and discharge to the creek additional stormwater, as needed. The combined capacity of the Final (Upper and Lower) Treatment System will be 2.7 MGD, and stormwater exceeding this capacity will be stored in the Quarry until treatment is feasible. Remaining stormwater discharges are regulated with Best Management Practices to reduce suspended solids, settleable solids, and pH. All current site ponds that discharge to Permanente Creek are covered under the NPDES permit and are not regulated by these WDRs.

   Historical permits for the Site include the Industrial General Permit, which required that the Dischargers develop and implement a Storm Water Pollution Prevention Plan. This order superseded the Site's individual permits (Order No. 97-061 and Order No. 74-65), which have been rescinded. Site stormwater was regulated under the Industrial General Permit until February 2011, when the Water Board determined that the Industrial General Permit was insufficient to protect water quality and required that Lehigh apply for an individual NPDES permit. Site discharges were covered under the General Permit for Aggregate Mining and Sand

Washing/Offloading, Order No. R2-2008-0011, as an interim measure pending adoption of Order No. R2-2014-0010.

4. **Permanente Creek Selenium TMDL:** A Total Maximum Daily Load (TMDL) is in development for Permanent Creek due to its impairment by selenium, which exceeds applicable water quality objectives in the water column. Water Board staff have evaluated selenium concentrations in creek water and sediment, as well as in Lehigh's wastewater and stormwater discharges, and identified that these discharges are a major source to the watershed. It is expected that onsite runoff control measures and water treatment systems in place and planned for the future, as required by the NPDES permit, will remove most selenium in the discharge, resulting in substantial improvements in creek water and sediment quality.

5. **Cleanup and Abatement Order and Section 401 Water Quality Certification**: In 1999, the Water Board issued Cleanup and Abatement Order (CAO) 99-018 to the Lehigh Southwest Cement Company to address excessive inputs of sediment to Permanente Creek associated with Quarry operations, cement manufacturing operations, and disposal areas for mining overburden. CAO 99-018 required several modifications to operations at the facility to provide off-channel settling basins, to direct stormwater runoff away from direct discharge to Permanente Creek, and to reduce the contribution of overburden deposits to in-creek turbidity. In addition, the CAO required that Lehigh provide a long-term restoration plan for Permanente Creek. Per the CAO, Lehigh prepared and submitted creek restoration plans that were evaluated by Water Board staff, who required revisions in several iterations. Prior to settling on a final creek restoration plan, the Sierra Club sued for completion of the plan to advance creek restoration, and the final long-term restoration plan was ultimately set forth in a Consent Decree. The Water Board and other environmental agency staff provided significant input to ensure the plan is sustainable and appropriate for the setting and minimizes impacts to threatened species. Permit applications for the restoration project have been submitted, and the project is undergoing environmental review to support future permitting. Once the environmental review process is complete, the Water Board may issue a Water Quality Certification pursuant to section 401 of the federal Clean Water Act (i.e., "401 Certification") for reclamation and creek restoration activities.