

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER R5-2017-0077

WASTE DISCHARGE REQUIREMENTS  
FOR

LEHIGH SOUTHWEST CEMENT COMPANY  
CALAVERAS CEMENT COMPANY  
CALAVERAS CEMENT PLANT  
CALAVERAS COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Central Valley Water Board) finds that:

1. Lehigh Southwest Cement Company and Calaveras Cement Company (hereafter jointly Discharger or Lehigh), owns and operates the Calaveras Cement Plant (hereafter Calaveras Cement or facility or site) about 2.5 miles south of San Andreas, CA. The Discharger's property is located in the northern parts of Sections 29, 30, 31 and 32, and southern parts of Sections 19 and 20, T4N, R12E, MDB&M. The facility is a Group B mining waste management site regulated under authority given in Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 et seq.) and the Mining Waste Management Regulations in California Code of Regulations, title 27, section 22470 et seq. (Title 27).
2. Mining activities at the facility were originally regulated by National Pollutant Discharge Elimination System Order No. CA0003891 which regulated the discharge of cooling waters into the Calaveritas Creek. This order was rescinded in 1979 after the Discharger made a material change in the disposal method with the reuse of cooling water. Since mining and processing activities ceased in 1982, the Board has updated Waste Discharge Requirements (WDRs) for closure of this site on three separate occasions: WDRs Orders No. 87-213, 97-011, and 98-095 reflect those periodic updates. This Order supersedes all prior WDRs Orders.
3. The following documents are attached to this Order and hereby incorporated into and made a part of this Order by reference:
  - a. Attachment A – Site Location Map
  - b. Attachment B – Site Map
  - c. Attachment C – CKD-1 Groundwater Contours and Groundwater and Surface Water Monitoring Network
  - d. Attachment D – CKD-3 Groundwater Contours and Groundwater and Surface Water Monitoring Network
  - e. Attachment E – CKD-3 Cross Section
  - f. Attachment F – CKD-3 Preliminary Closure Design: Regrade and Cover with Subsurface Drainage

4. The following acronyms are used throughout this Order:

CKD	Cement Kiln Dust
COC	Constituents of Concern
COD	Chemical Oxygen Demand
EC	Electric Conductivity
EFS	Engineering Feasibility Study for Corrective Action
LCRS	Leachate Collection and Removal System
TDS	Total Dissolved Solids
MCL	Maximum Contaminant Level
MRP	Monitoring and Reporting Program
MU	Mining Unit
ROWD	Report of Waste Discharge
TDS	Total Dissolved Solids
WDR	Waste Discharge Requirements
WQPS	Water Quality Protection Standards

5. The facility is located on a 250-acre property at the cross-section of the Pool Station Road and the Cement Plant Road 2.5 miles south of San Andreas as shown on Attachment A. As shown in Attachment B, the facility is comprised of Assessor's Parcel Numbers (APN) 44-001-011, 44-001-012, 44-001-024, 44-001-046, 44-001-47, 44-008-004, 44-008-008, 44-008-009, 44-008-010, 44-008-011, 44-008-024, 44-008-025, 44-008-026, 44-008-027, 44-008-028, 44-008-031, 44-008-032, 44-008-042, 044-008-059, 44-008-064, and 44-008-065.
6. The facility opened in 1926 as the Calaveras Cement Company. It quarried limestone from the Quarry Pit and produced cement for over 50 years. While the facility was in operation from 1926 to 1982, cement kiln dust (CKD) and waste rock were discharged to three cement kiln dust piles (CKD-1, CKD-2, CKD-3) and two waste rock piles (West Rock Storage Area & East Rock Storage Area) shown on Attachments A and B. Cement production ceased in 1983. Manufacturing facilities have since been decommissioned and demolished.
7. These WDRs address the Closure and post-Closure Maintenance of the following mine waste containment facilities (mining units):
- Cement Kiln Dust Pile 1 (CKD-1) shown on Attachments B and C is a Group B mining unit (MU) that was closed pursuant Title 27 requirements in 1998.
  - Cement Kiln Dust Pile 3 (CKD-3) shown on Attachments B-F is a Group B MU that is currently in corrective action due to the hexavalent chromium and other constituents of concern identified in surface water and groundwater downgradient of the CKD pile. The Discharger has proposed closure with a low permeability cover and a leachate collection and removal system (LCRS) as shown on Attachment F.
  - The former Quarry Pit shown on Attachments A and B is filled with groundwater and has been used for transfer of leachate from CKD-1. Water pumped from the CKD-1

LCRS had been measured as essentially zero through November 2016 after changes and improvements were made to the CKD-1 LCRS during summer 2016. Between mid-December 2016 and mid-March 2017, approximately 300,000 gallons of water per month had been pumped.

- d. The West Waste Storage Area and the East Waste Storage Area as shown on Attachments A and B are waste rock stockpiles, and are both classified as Group C mining waste.
- e. The Calaveras Materials Inc., an aggregate processing facility, is an active subsidiary of Lehigh Southwest Cement Company currently mining rock in the West Rock Storage area as shown on Attachment B.

Constituents of concern within CKD-1 and CKD-3 include high pH, high electrical conductivity (EC), total dissolved solids (TDS), chemical oxygen demand (COD), aluminum, copper, total and hexavalent chromium, lead, molybdenum, manganese, and mercury.

- 8. On 16 December 2016, the Discharger submitted an updated Report of Waste Discharge (ROWD), which has been used in revising this Order. The ROWD and supporting documents contain proposed facility changes including:
  - a. Conceptual plan and cost estimates for closure of CKD-3;
  - b. Continued removal of leachate from CKD-1 and transfer to the Quarry Pit<sup>1</sup>;
  - c. Future removal of leachate from CKD-3 and transfer to the Quarry Pit<sup>2</sup>;
  - d. Implementation of post-closure maintenance of the site;
  - e. Plans for continued waste rock reuse for aggregate production.
- 9. This Order implements the applicable regulations for discharges of solid waste to land through Prohibitions, Specifications, Provisions, and Monitoring and Reporting requirements. Prohibitions, Specifications, and Provisions are listed in Sections A through H of these WDRs below, and in the Standard Provisions and Reporting Requirements (SPRRs), dated April 2016 included as Attachment G. Monitoring and Reporting requirements are included in the Monitoring and Reporting Program (MRP) R5-2017-0077 and in the SPRRs. In general, requirements that are either in regulation or otherwise apply to all facilities regulated under Title 27 are considered to be "standard" and are therefore in the SPRRs. Any site-specific changes to a requirement in the SPRRs are included in the applicable section (A through H) of these WDRs, and requirements in the WDRs supersede the requirement in the SPRRs.

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<sup>1</sup> Following tentative WDR review, Lehigh agreed to discontinue transfer and develop an alternate leachate disposal method in 180 days from adoption of this Order.

<sup>2</sup> Lehigh agreed to develop an alternate leachate disposal method as a part of CKD-3 design plan.

## WASTE CLASSIFICATION AND UNIT CLASSIFICATION

10. The facility consists of five MUs classified as containing either a Group B or Group C mining waste. The mining wastes have been classified as Group B or Group C mining wastes based on an assessment of the potential risk of water quality degradation posed by each waste and in accordance with Title 27, § 22480, which states, in part:

**Group B – mining waste of Group B is either:**

- a. *mining wastes that consist of or contain hazardous wastes, that qualify for a variance under Chapter 11 of Division 4.5, of Title 22 of this code, provided that the [regional water quality control board] finds that such mining wastes pose a low risk to water quality; or*
- b. *mining wastes that consist of or contain nonhazardous soluble pollutants of concentrations which exceed water quality objectives for, or could cause, degradation of waters of the state; or*

**Group C – mining wastes from Group C are wastes from which any discharge would be in compliance with the applicable water quality control plan, including water quality objectives other than turbidity.**

Group B mining waste can be discharged only at Group B Mining Units which comply with Title 27 Mining Waste Management Regulations and have been approved by the Regional Board for containment of the particular kind of waste to be discharged.

11. The existing MUs authorized by this Order are described as follows:

MU (Size)	Title 27 Waste Classification – Description and COC	Liner/LCRS <sup>1</sup> Components	Status
CKD-1 (16 acres)	<p><u>Group B solid waste:</u> 472,000 cubic yards of highly alkaline cement kiln dust</p> <p><u>Group B liquid waste – leachate</u></p> <p><u>Constituents of concern:</u></p> <ul style="list-style-type: none"><li>– pH</li><li>– TDS</li><li>– EC</li><li>– COD</li><li>– Aluminum</li><li>– Total chromium</li><li>– Hexavalent chromium</li><li>– Copper</li><li>– Lead</li><li>– Molybdenum</li><li>– Manganese</li><li>– Mercury</li></ul>	<p><u>Final Cover:</u></p> <ul style="list-style-type: none"><li>– One-foot thick vegetative cover</li><li>– One-foot thick compacted layer with a permeability <math>1 \times 10^{-6}</math> cm/s or less</li><li>– Two-foot thick compacted soil foundation layer</li></ul> <p><u>LCRS:</u></p> <ul style="list-style-type: none"><li>– Leachate collection trench at the base of the landfill</li><li>– Primary leachate sump</li></ul> <p><u>Base Liner System:</u></p> <ul style="list-style-type: none"><li>– 2 feet of compacted CKD</li></ul>	<u>Closed in 1998.</u>

MU (Size)	Title 27 Waste Classification – Description and COC	Liner/LCRS <sup>1</sup> Components	Status
CKD-3 (8 acres)	<u>Group B solid waste:</u> Estimated 430,000 cubic yards of highly alkaline cement kiln dust  <u>Group B Liquid waste – leachate:</u>  <u>Constituents of concern:</u> <ul style="list-style-type: none"> <li>– pH</li> <li>– TDS</li> <li>– EC</li> <li>– COD</li> <li>– Aluminum</li> <li>– Total chromium</li> <li>– Hexavalent chromium</li> <li>– Molybdenum</li> </ul>	<u>Final Cover (proposed):</u> <ul style="list-style-type: none"> <li>– High Density Polyethylene (HDPE) or linear low density polyethylene (LLDPE) combined with additional cover, drainage layer (if required), and a vegetative soil layer.</li> </ul> <u>LCRS (proposed):</u> <ul style="list-style-type: none"> <li>– Leachate collection trenches</li> <li>– Pumps</li> </ul> <u>Base Liner System:</u> <ul style="list-style-type: none"> <li>– None</li> </ul>	<u>Corrective Action:</u> <u>Conceptual closure plan</u> <ul style="list-style-type: none"> <li>– Regrade, cover with low permeability cover</li> <li>– install LCRS</li> </ul>
<b>East Rock Storage Area (18 acres) (previously considered to be a part of CKD-3)</b>	<u>Group C solid waste:</u> Waste rock, mostly limestone and dolostone  <u>Constituents of concern:</u> <ul style="list-style-type: none"> <li>– turbidity</li> </ul>	<u>Final Cover and Base Liner System:</u> <ul style="list-style-type: none"> <li>– Not required</li> </ul>	<u>Inactive:</u> <ul style="list-style-type: none"> <li>– Future mining for aggregate</li> </ul>
<b>West Rock Storage Area (50 acres)</b>	<u>Group C solid waste:</u> Waste rock, mostly limestone and dolostone  <u>Constituents of concern:</u> <ul style="list-style-type: none"> <li>– turbidity</li> </ul>	<u>Final Cover and Base Liner System:</u> <ul style="list-style-type: none"> <li>– Not required</li> </ul>	<u>Active:</u> <ul style="list-style-type: none"> <li>– Current mining for aggregate production by Calaveras Materials Inc.</li> </ul>

12. Since the previous WDRs were adopted, the Discharger has completed the following activities at the site:
- Removed CKD from CKD-2 and relocated it to CKD-1.
  - Closed CKD-1 pursuant Title 27 requirements in 1998.
  - Demolished cement plant buildings and removed waste piles.
  - Installed two groundwater monitoring wells (MW-7 and MW-8) and several piezometers (PZ-1 to PZ-7) at CKD-3 as shown on Attachment D.
  - Graded CKD-3 top-deck to prevent ponding.
  - Constructed a perimeter drainage channel along the east side of CKD-3.
  - Completed CKD-3 investigations and prepared a conceptual plan for CKD-3 closure.
  - Continued to reuse waste rock for aggregate.

### CKD-1 and CKD-3

13. WDRs Order No. 98-095 classified cement kiln dust left behind by cement production as Group B mining waste. These WDRs continue that classification.
14. The Discharger used a wet production process wherein a mixture of 85% limestone plus shale, sand, and iron ore was crushed and reduced in size by a wet grinding process, then delivered to kilns where the water was evaporated and calcination occurred. This process produced cement clinker, which was then ground to very fine powdered cement. A portion of the kiln dust collected by electrostatic precipitators was recycled into the kilns during operations. Highly alkaline dust collected from the final stage precipitator was removed and stockpiled on the property.
15. CKD consists of a mixture of unreacted raw feed, clinker dust, and ash. Chemically, it consists mainly of calcium carbonate, calcium oxide, silicon dioxide, and other metal-oxides. Its chemically dehydrated nature, resulting from exposure to high kiln temperatures, can cause CKD to have a high tendency to absorb water. The CKD in both CKD-1 and CKD-3 units has been in place for many decades and has been hydrated during that period. Hydration drives the chemical reaction to "harden" cement, and thus the CKD now resembles concrete more than cement. This also makes the material less chemically reactive.
16. During early production, CKD generated onsite was stockpiled at CKD-1 and CKD-2. During reclamation and closure, approximately 72,000 cubic yards of CKD from the former CKD-2 location (see Attachment A) were transferred into CKD-1, as required by WDR Order No. 87-213. CKD-2 was restored and regraded to natural contours. After reclamation, an existing spring-fed stream was reestablished through the CKD-2 location. CKD-1 was closed in accordance with Title 27 requirements in 1998.
17. Closure of the CKD-1 Group B Mining Unit in 1998 served as a corrective action under Article 5 of Chapter 15 (Chapter 15 was a predecessor to Title 27). Groundwater monitoring data at the time Order No. 98-095 was prepared indicated that CKD-1 waste pile had impacted the groundwater by elevating the concentrations of pH, TDS, and several dissolved metals. COC included aluminum (52,000 µg/l), cadmium (32.4 µg/l), chromium (150 µg/l), lead (up to 43.2 µg/l), mercury (3.5 µg/l), and nickel (223 µg/l). Closure of CKD-1 as corrective action was successful and resulted in decrease of concentrations of these COC closer to or below water quality protection standards (WQPS) in groundwater monitoring wells.
18. Significant amounts of CKD were also discharged at CKD-3. A 3-D model presented in the 30 June 2016 *Engineering Feasibility Study for Corrective Action* (EFS) estimates that there are approximately 430,000 cubic yards of CKD in CKD-3. CKD in CKD-3 is a fairly contiguous unit of white to light gray, non-plastic fine grained sediment with relatively high pH (10-12 standard pH units). In some locations, the unit contains some fine to coarse sub angular gravel in a fine grained matrix.

19. Over 10 years ago, CKD-3 was graded and covered with soil to prevent direct exposure and erosion of the CKD. Stormwater best management practices have been maintained to minimize surface water impacts. As shown on Attachment B, CKD is limited to an area of approximately 8 acres in the central and southern portions of CKD-3 top-deck and the lower area upslope from the containment berm; the rest of what was previously considered CKD-3 has been designated in the ROWD as the East Rock Storage Area.
20. EFS investigations of leaching of hexavalent chromium from CKD confirmed that CKD in CKD-3 is the source of hexavalent chromium in the downgradient detection groundwater monitoring well MW-8. Groundwater in MW-8 is also impacted by pH, EC, TDS, COD, and total chromium and molybdenum.
21. This WDRs Order classifies CKD leachate generated by CKD MUs as **Group B** liquid waste based on historical concentrations of COC in groundwater monitoring well MW-4 prior to CKD-1 closure (see Attachment C for MW-4 well location). Monitoring and Reporting Program accompanying WDRs Order No. 98-095 listed groundwater monitoring well MW-4, located at the toe of CKD-1, as a leachate sampling location until the groundwater quality in MW-4 met the established water quality protection standards. Concentrations of COCs representative of the composition of leachate from CKD are based on historical MW-4 data from 1990 to 1998 as follows: pH ranged from 11 to 12; EC from 8,000 to 25,000 µmhos/cm; COD from 100 to 400 mg/l; aluminum from 18,000 to 53,000 µg/g; total chromium from 20 to 150 µg/g; and copper from 20 to 120 µg/g.

### Quarry Pit

22. Calaveras Cement mined limestone from the Quarry Pit to a depth of about 230 feet. After mining ceased, the quarry filled up with groundwater. Estimated storage volume of the Pit is 1,775 acre feet. WDRs Order No. 98-095 allowed leachate from CKD-1 to be transferred and discharged into the Pit. The Discharger proposed in the ROWD to continue to transfer mine waste impacted leachate from MU CKD-1 into the Quarry Pit and to start the transfer of mine waste impacted leachate from MU CKD-3 into the Quarry Pit after closure.
23. After changes and improvements were made to the CKD-1 LCRS during summer 2016, water pumped from the CKD-1 LCRS had been measured as essentially zero through November 2016. During an excessively wet winter between mid-December 2016 and mid-March 2017, approximately 300,000 gallons of water per month had been pumped to the Quarry pit. The Discharger believes this increase is due to the location of the unlined leachate trench near the Calaveritas Creek. The Discharger proposes to correct this issue by separating creek flow from the LCRS trench and requested to develop an appropriate CKD-1 leachate management strategy to be submitted for Board approval within 180 days after adoption of this Order.
24. The Quarry Pit is the former limestone quarry that is filled with groundwater. This groundwater is a water of the State of which the beneficial uses include municipal and domestic water supply agricultural supply, industrial service supply, and industrial

process supply. Thereby, this Order prohibits the discharge of leachate into the Quarry Pit to protect the beneficial uses of groundwater.

25. The Quarry Pit is located in a limestone quarry and contains water that has been in continuous contact with exposed limestone on the pit walls and floor. Limestone influenced waters typically exhibit a near neutral to alkaline pH and slightly elevated TDS and EC levels due to the calcium carbonate nature of the rock. This water quality is unlikely to have adverse environmental impacts because the water quality of the Quarry Pit is demonstrative of the natural contact of water with native, in-place limestone.

Quarry Pit water quality data show EC and TDS values resemble groundwater WQPS. The average post-CKD-1 closure values of EC and TDS for the Quarry Pit are shown in the table below. Surface water WQPS, and groundwater WQPS for CKD-1 and CKD-3 are provided for comparison.

Average Quarry Pit Water Quality Compared to Surface Water and Groundwater WQPS

Constituent	Units	Quarry Pit 1999-2016 Average (SW-3)	Surface water WQPS (SW-1)	CKD-1 Groundwater WQPS	CKD-3 Groundwater WQPS
EC	µmhos/cm	787	373	679	700
TDS	mg/l	583	213	559	255

### Waste Rock Storage Areas

26. During active mining operations, waste rock was discharged into the East and West Rock Storage Areas (see Attachment B). Between 1992 and 2007, waste rock was re-mined for saleable aggregate materials from the East Rock Storage Area forming a large excavation pit on the east side of CKD-3. Oversize materials were sorted and pushed to the side. Useable material was processed by sorting and washing on the top of CKD-3. Approximately 200,000 tons of waste rock was removed from East Rock Storage Area during this period.
27. Current aggregate operations conducted by Calaveras Materials Inc., a subsidiary of Lehigh Southwest Cement Company, is mining and processing waste rock in the West Rock Storage Area for saleable materials (see Attachment B). The Discharger plans to continue this operation and move it to the East Waste Rock Storage Area after the West Waste Rock Storage Area is mined out. This order acknowledges the Discharger's plans to continue to mine and process waste rock at the site.
28. This WDR Order concurs with the Discharger's Mining Waste Characterization Report for Calaveras Materials Inc. Aggregate Mining Operation included in the ROWD which proposes Group C classification for waste rock in the East and West Rock Storage Areas and haul-back cement processed at the aggregate mining operation. The results of the acid-base accounting analysis (ABA) indicated that the acid neutralization potential of limestone waste rock samples far exceeds the acid generation potential. The concentrations of total and leachable metals in waste rock remained below regulatory

thresholds and in most cases below water quality objectives. Dissolved barium and chromium concentrations were slightly above the primary MCL for drinking water for the two haul-back cement samples. The report suggests that the haul-back cement pile is temporary and unlikely to cause degradation to waters of the state.

### SITE DESCRIPTION

29. The site is located in the foothills west of the high mountains of the Sierra Nevada and east of the Central Valley. Surface waters from the facility drain to the Calaveritas Creek and the South Fork of the Calaveras River which flows to the Calaveras River thence to the San Joaquin River.
30. Land uses within one mile of the facility include agricultural preserve, rural residential, single and multiple family residential, general commercial, light industrial, and general industrial.
31. According to public resources available from the Calaveras County and United States Geological Survey, there are no municipal, domestic, industrial, or agricultural groundwater supply wells within one mile of the facility.
32. The geology of the area is structurally complex and is situated in the westerly portion of the Foothills Fault System, which is characterized by strong strike-faulting and shearing which has resulted in a series of prominent northwestward trending ridges underlain by metamorphic rocks that are folded and faulted. In addition, numerous granitic intrusions have occurred. The eastern portion of the valley is underlain by Paleozoic sedimentary rocks, and greenschist rocks. Primary lithologies in the site vicinity include Paleozoic metasedimentary rocks including quartzite, pelitic schist, limestone, and dolostone, as well as the Calaveras Complex consisting mainly of interbedded limestone, recrystallized limestone and dolostone. Foliation of the bedrock is generally oriented in a northwest-southeast direction with nearly vertical bedding, as are the major faults in the area. The bases of the valleys are covered by alluvial sediments situated on bedrock. The bedrock is characterized by a weathered zone which can extend to depths of 20 to 50 feet or more below the original metamorphic contact with alluvial sediment. The alluvial sediments in the facility vicinity tend to be shallow.
33. The facility receives an average of 28.5 inches of precipitation per year as determined from the isohyetal map of 30-year (1981-2010) average rainfall information obtained from Prism Climate Group, Oregon State University. The 100-year wet season was calculated to be 59.98 inches based on data from the historical records obtained from the Department of Water Resources DWR for the San Andreas 2S Station (B20 7702 00) located approximately 1.8 miles from the Site. The mean pan evaporation is 55.9 inches per year as measured at the Plymouth Station (Station ID 227).
34. The site lies partially within a 100-year flood plain based on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, Community-Panel Number 06009C040W. The lowermost edges of CKD-1 and CKD-3 are located adjacent to and may slightly encroach upon the 100 year floodplain of Calaveritas Creek.

## SURFACE WATER AND GROUNDWATER CONDITIONS

35. The *Water Quality Control Plan for Sacramento and San Joaquin River Basins, Fourth Edition*, revised April 2016 (hereafter Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.
36. Surface water drainage from the site is to Calaveritas Creek thence to the South Fork Calaveras River which drains to the Calaveras River which is a tributary to the San Joaquin River and the Sacramento-San Joaquin Delta.
37. The Basin Plan does not specifically identify designated beneficial uses for the Calaveritas Creek and the South Fork Calaveras River, but it does identify the existing beneficial uses for the Calaveras River from the source to the New Hogan Reservoir, which also apply to all upstream tributaries (Basin Plan, page II-2.00). These existing beneficial uses are Water Contact Recreation; Non-contact Water Recreation; Warm Freshwater Habitat; Cold Freshwater Habitat; Migration of Aquatic Organisms, Warm; Spawning, Reproduction, and/or Early Development; and Wildlife Habitat. The beneficial uses of the Sacramento-San Joaquin Delta are: Municipal and Domestic Supply; Agricultural Supply; Industrial Process Supply; Industrial Service Supply; Water Contact Recreation; Non-contact Water Recreation; Warm Freshwater Habitat; Cold Freshwater Habitat; Migration of Aquatic Organisms; Spawning, Reproduction, and/or Early Development; Wildlife Habitat; and Navigation.
38. At CKD-1, the first encountered groundwater occurs at approximately 80 feet below the surface at the upslope boundary of the unit and at approximately 10 feet below the surface at the toe of the unit. Groundwater elevation measurements from the piezometers and wells and the groundwater contours shown on Attachment C indicate the groundwater gradient in the vicinity is generally to the northwest toward the Kentucky House Reservoir. The estimated average groundwater gradient is 0.02 feet per foot. Groundwater elevation data show that the base of the waste material is not in contact with groundwater beneath CKD-1.
39. The canyon where CKD-3 is located forms a small groundwater sub-basin with a drainage area of approximately 130 acres. The valley does not appear to be hydraulically connected to areas east, west, and north of CKD-3. Depths to groundwater range between 4.4 feet below ground surface along the southern toe of CKD-3 to 91.6 feet below ground surface on top of CKD-3. Groundwater is monitored in a number of wells and piezometers which are screened in alluvium, CKD, or underlying bedrock, depending on their location in relation to the unit. As shown on attachment D, groundwater elevation measurements from the piezometers and wells in the vicinity of CKD-3 indicate the groundwater gradient in the vicinity is generally to the south. The estimated average groundwater gradient is 0.11 feet per foot following topography.

The Discharger states that groundwater downgradient of CKD-3 exists in two chemically different aquifers. A shallow aquifer, approximately 20 feet deep and apparently ending just downgradient from MW-8, shows influence from CKD-3. Sample results from a

discrete hydro-punch sample identified a deeper water bearing zone below 20 feet, which apparently extends down the CKD-3 valley shows no sign of impact from CKD-3.

Attachment E shows that groundwater is present in CKD-3. There is evidence of a seepage area at the southern toe of CKD-3. The small amount of seepage flows into the unnamed drainage channel in the canyon in which CKD-3 is situated.

40. The designated beneficial uses of the groundwater, as specified in the Basin Plan, are domestic and municipal water supply, agricultural supply, industrial service supply, and industrial process supply.

### **GROUNDWATER AND SURFACE WATER MONITORING**

41. The existing groundwater monitoring network for CKD-1 consists of upgradient background monitoring well MW-9, detection/corrective action monitoring wells MW-4 and MW-6, and groundwater elevation monitoring well MW-2 as shown on Attachment C and detailed in MRP R5-2017-0077. MW-4 and MW-6 are located directly downgradient of the unit. MW-4 monitors the first encountered groundwater, and MW-6 monitors a deeper water bearing zone. This existing groundwater monitoring network at CKD-1 is not sufficient to monitor the groundwater flow, direction, and water quality. This Order requires the Discharger to add a minimum of one additional groundwater monitoring well to the CKD-1 Mining Unit.
42. The existing groundwater monitoring network for CKD-3 consists of upgradient background monitoring well MW-7, a downgradient detection/corrective action monitoring well MW-8, and seven piezometers to monitor groundwater elevations (PZ-1 to PZ-7) as shown on Attachment D and detailed in MRP R5-2017-0077.
43. Surface water monitoring at the Site occurs at the following locations, as shown on Attachments B-D and detailed in MRP R5-2017-0077:
  - a. SW-1 is located in Calaveritas Creek upstream from CKD-1 and upstream of where the un-named drainage below CKD-3 would join with Calaveritas Creek. SW-1 is representative of background water quality conditions for Calaveritas Creek.
  - b. SW-2 is located downstream from CKD-1 in Calaveritas Creek.
  - c. SW-3 is the Quarry Pit water.
  - d. SW-4 is located in the retention pond on the surface of the lower deck of CKD-3.
  - e. SW-5 is located in the upstream portion of the runoff diversion ditch around the northeast of CKD-3 and represents background surface water conditions for CKD-3.
  - f. SW-6 is located in the Calaveritas Creek upstream from CKD-1 and downstream of the location where the unnamed drainage would flow into Calaveritas Creek.
44. The Discharger submitted Water Quality Protection Standards (WQPS) reports on 31 July 2000, 31 March 2005, and 15 September 2006, proposing statistical data analysis methods to calculate concentration limits for each monitored constituent in

accordance with Title 27. The WQPS report proposed to use intrawell data analysis to calculate tolerance limits for the monitored constituents. The WQPS and approved data evaluation methods are included in MRP R5-2017-0077.

## **GROUNDWATER DEGRADATION AND CORRECTIVE ACTION**

### **CKD-1**

45. Closure of the CKD-1 Group B Mining Unit in 1998 served as a corrective action under Article 5 of Chapter 15. Chapter 15 was the predecessor to Title 27. Groundwater monitoring data at the time Order No. 98-095 was prepared indicated that CKD-1 waste pile has impacted the groundwater by elevating the concentrations of pH, TDS, and several dissolved metals. Constituents of concern included aluminum (52,000 µg/l), cadmium (32.4 µg/l), chromium (150 µg/l), lead (up to 43.2 µg/l), mercury (3.5 µg/l), and nickel (223 µg/l). Closure of CKD-1 resulted in gradual decrease of the concentrations of these COCs in groundwater monitoring wells.
46. In 2015, following the review of MRP reports, staff requested an investigation into the causes of increasing volumes of leachate removed from CKD-1 and the exceedances of several COCs in compliance groundwater monitoring wells MW-4 and MW-6. The Discharger's CKD-1 investigation report submitted on 2 February 2016 did not find conclusive evidence for a potential release from the unit, but found evidence for partial erosion of the cover system and problems with the integrity of LCRS. The Discharger repaired the erosion of the cover, investigated the integrity of LCRS and proposed and completed modifications to LCRS. The Discharger discontinued pumping from secondary sump to the main collection sump and reconfigured and replaced the flow measurement and recording system.
47. However, as shown by the 2016 Annual Monitoring Report, the exceedances of several COCs in the compliance groundwater monitoring wells continue to exceed their respective WQPS. These include TDS, EC, COD, total and hexavalent chromium, and copper.

### **CKD-3**

48. At the time Order No. 98-095 was prepared, the Discharger was investigating the nature, volume, and extent of the material in CKD-3. After initial investigations, two groundwater monitoring wells and seven piezometers were installed at the unit as shown in Attachment D. Dissolved molybdenum and hexavalent chromium analyses were added to the monitoring parameters list for surface and groundwater on 2 January 2001.
49. After the 2014 monitoring report review which indicated CKD-3 may have impacted groundwater and surface water downgradient from the unit, staff requested that the Discharger evaluate and interpret monitoring data to ascertain whether they show a measurably significant evidence of a potential release.

50. On 16 December 2014, the Discharger submitted notification of a measurably significant evidence of a release from CKD-3 observed in the monitoring data. TDS, pH, aluminum, total chromium, hexavalent chromium, and molybdenum concentrations in groundwater in compliance well MW-8 exceeded WQPS. Historical MRP surface water monitoring data indicated periodic WQPS exceedances at SW-6 for EC, TDS, molybdenum, and manganese.

The Discharger submitted a partial *Amended Report of Waste Discharge* on 17 February 2015 and an *Engineering Feasibility Study (EFS) for Corrective Action* on 30 June 2016. The EFS was amended on 28 September 2016. Staff concurred with the conceptual closure plan for CKD-3 on 6 October 2016 and requested submittal of detailed closure technical design plans and construction quality assurance (CQA) plans in compliance with Title 27 siting and construction requirements for Group B waste. The design plans for CKD-3 are due within 180 days of adoption of these WDRs.

51. The Discharger is proposing to close CKD-3 with a low permeability cover system as shown in Attachment F. Currently, it is projected that the low-permeability cover will consist of an impermeable geomembrane such as high density polyethylene (HDPE) or linear low density polyethylene (LLDPE) and a soil and/or rock cover layer. Additional analyses will be completed to determine the type and thickness of additional cover components such as a bedding layer, drainage layer (if required), and vegetative soil layer.
52. The proposed CKD-3 LCRS will consist of a collection trench along the lower deck of CKD-3 to allow interception of seepage. The leachate shall be pumped to appropriate container(s) and either disposed offsite, or treated on-site and discharged to land under an appropriate discharge to land permit or general order. As included in the Prohibitions Section, this Order prohibits the discharge of leachate or any waste to the Quarry Pit.
53. Proposed calculations to support the final design will include completion of the Revised Universal Soil Loss Equation to verify that cover erosion is not excessive, slope stability analyses to confirm that the proposed grades are stable under static and dynamic loading, and completion of hydraulic calculations for surface water controls to verify they can convey the minimum design storm of a 100-year, 24 hour storm.

### **CLOSURE AND POST-CLOSURE MAINTENANCE OF MINING UNITS**

54. The Discharger included preliminary closure of CKD-3 and post-closure monitoring and maintenance for CKD-1 and CKD-3 information in the December 2016 ROWD. Conceptual design for closure of CDK-3 is outlined in the Groundwater and Corrective Action section.
55. Post-closure maintenance plans for CKD-1 and CKD-3 include inspection and monitoring activities for 30 years after the closure of entire site or until the site is no longer a threat to water quality.

## FINANCIAL ASSURANCES

56. California Code of Regulations Title 27, section 22510 requires the discharger to provide for adequate funding to pay for the costs of closure and post closure maintenance as required by this article. The discharger shall provide assurance of financial responsibility, acceptable to the regional water quality control board, pursuant to Chapter 6 of this title, and the regional water quality control board shall periodically review financial assurances and shall modify them as necessary. The Discharger's 16 December 2016 ROWD included a CKD-3 Preliminary Closure and Post Closure Maintenance Plans for CKD-1 and CKD-3 (PC/PCMP) for closure and post closure maintenance for CKD-1, CKD-3, and the Quarry Pit. The PC/PCMP includes a cost estimate for CKD-3 closure in the amount of **\$1,125,687 in 2016 dollars** and the post-closure costs for 30 years in the amount of **\$2,440,339 in 2016 dollars**. As of 2016, the balance of the closure fund was **\$3,566,026**. Staff concurs with these closure and post-closure cost estimates for CKD-1 and CKD-3. Future financial assurances need to include all mining units. This Order requires that the Discharger maintain financial assurance with the Central Valley Water Board in at least the amount of the closure cost estimate.

## CEQA AND OTHER CONSIDERATIONS

57. The action to revise waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality Act (CEQA), Public Resource Code section 21000, et seq., and the CEQA guidelines, in accordance with Title 14, section 15301.
58. This order implements:
- *The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition.*
  - The prescriptive standards and performance goals of California Code of Regulations, Title 27, Mining Waste Management Regulations, section 22470 et seq.
59. Based on the threat and complexity of the discharge, the facility is determined to be classified **2B** as defined below:
- Category 2 threat to water quality**, defined as, “Those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short-term violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance.”
- Category B complexity**, defined as, “Any discharger not included in Category A that has physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal), or any Class 2 or Class 3 waste management units.”
60. Water Code section 13267(b) provides that: “In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to

discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports."

61. The technical reports required by this Order and the attached "Monitoring and Reporting Program R5-2017-0077" are necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.

### **PROCEDURAL REQUIREMENTS**

62. The Central Valley Water Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
63. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.
64. Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date that this Order becomes final, except that if the thirtieth day following the date that this Order becomes final falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:  
[http://www.waterboards.ca.gov/public\\_notices/petitions/water\\_quality](http://www.waterboards.ca.gov/public_notices/petitions/water_quality)  
or will be provided upon request.

**IT IS HEREBY ORDERED**, pursuant to California Water Code sections 13263 and 13267, that **WDRs Order No. 98-095** is rescinded except for purposes of enforcement, and that Lehigh Southwest Cement Company and Calaveras Cement Company, their agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

#### **A. PROHIBITIONS**

1. The discharge of hazardous waste, designated waste, and mining waste is prohibited other than as described in these WDRs. For the purposes of this Order, the terms hazardous waste, designated waste, and mining waste are as defined in California Code of Regulations Title 27.

2. Other than materials from the sand and gravel or asphalt concrete operations to be recycled at the Calaveras Materials Inc., the discharge or deposit of waste from any other sources is prohibited. Processing<sup>3</sup> recycled materials such as cured concrete or asphalt pavement, which can be used to produce saleable materials, is consistent with the existing activities at the site, and is acceptable.
3. Discharge of processing water and separated solids produced at the Calaveras Materials Inc. to surface water or surface water drainage courses is prohibited.
4. The discharge or transfer of leachate, or any liquid or solid waste to the Quarry Pit is prohibited.
5. The Discharger shall comply with all Standard Prohibitions listed in Section C of the Standard Provisions and Reporting Requirements dated April 2016 (SPRRs).

## B. DISCHARGE SPECIFICATIONS

1. The discharge shall not cause a condition of pollution or nuisance as defined by Water Code section 13050.
2. The discharge shall not cause degradation of any water supply.
3. The Discharger shall use best management practices for management of process water and temporary discharges of materials to be recycled at the Calaveras Materials Inc. to prevent surface water and groundwater degradation.
4. The Discharger shall maintain site security throughout the closure period. Perimeter fences, locked gates and signs shall be maintained to exclude public entry to the site. Locks, gates, signs and fences shall be inspected quarterly; damaged security features shall be repaired or replaced immediately.
5. The Discharger shall comply with all Standard Discharge Specifications listed in Section D of the SPRRs dated April 2016.

## C. FACILITY SPECIFICATIONS

1. Annually, prior to the anticipated rainy season but no later than **15 October**, any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed and reported in compliance with MRP R5-2017-0077.
2. The Discharger shall expand their existing Storm Water Pollution Prevention Plan and Monitoring Program and Reporting Requirements in accordance with State Water Board

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<sup>3</sup> Processing includes receiving, storage, and the physical manipulation required to manufacture saleable products. Physical manipulation may include crushing, washing to remove fines, and screening. Processing also includes accepting uncured Portland cement or concrete, or washout from uncured Portland cement or concrete handling equipment (includes mixer trucks, pumps, concrete molds, etc.).

Order No. 2014-0057-DWQ (Industrial General Permit) or most recent general industrial storm water permit to cover the entire site, or retain all storm water on-site.

3. The Discharger shall comply with all Standard Discharge Specifications listed in Section E of the SPRRs dated April 2016.

### **CKD-1 and CKD-3**

4. The Discharger will develop an appropriate CKD-1 leachate management strategy to be submitted for Board approval within 180 days after adoption of this Order. In the interim period for 180 days after these WDRs are adopted, the Discharger will be required to monitor the level of leachate in the CKD-1 LCRS, but will not be required to pump or transfer the accumulated leachate into containers for disposal.
5. CKD-3 shall be closed per Title 27 requirements after all applicable construction quality assurance plans have been approved by Executive Officer.
6. The Discharger will develop an appropriate CKD-3 leachate management strategy as a part of CKD-3 closure design plans to be submitted for Board approval within 180 days after adoption of this order.

## **D. DESIGN AND CONSTRUCTION SPECIFICATIONS**

1. Mining units shall be designed and constructed pursuant Title 27, Section 22470 et seq. requirements.
2. Containment structures and precipitation and drainage control systems shall be constructed and maintained to prevent, to the greatest extent possible, inundation, erosion, slope failure, and washout under 100-year, 24-hour precipitation conditions.
3. Mining units shall be designed, constructed and operated to prevent inundation or washout due to flooding events with a 100-year return period.
4. Materials used to construct liners shall have appropriate physical and chemical properties to ensure containment of discharged wastes over their operating life.
5. Materials used to construct LCRSs shall have appropriate physical and chemical properties to ensure the required transmission of leachate.
6. The LCRSs shall be designed, constructed, and maintained to collect twice the anticipated daily volume of leachate generated by the Mining Unit. The LCRS extraction system shall be capable of removing this volume of leachate.
7. The depth of the fluid in any LCRS sump shall be kept at the minimum needed for safe pump operation without excessive pump cycling that could damage the pump.

8. The Discharger shall submit a design report including plans, specifications, and a construction quality assurance plan for review and approval prior to construction work related to the MU containment and cover systems.
9. The Discharger shall submit a final report documenting construction work related to the MU containment systems and cover for review and approval.
10. The Discharger shall comply with all Standard Design and Construction Specifications listed in Section F of the SPRRs dated April 2016.
11. The Discharger shall comply with all Storm Water Provisions listed in Section L of the SPRRs dated April 2016.

## E. CLOSURE AND POST-CLOSURE MAINTENANCE SPECIFICATIONS

1. The eight-acre MU CKD-3 closure design shall consist of a low permeability cover, LCRS, and stormwater controls. The unit shall be graded and closed pursuant to Title 27 requirements. Prior to construction, the Discharger shall submit Design Report with construction drawings and specifications. All applicable construction quality assurance plans shall be approved in writing by the Executive Officer.
2. The Discharger shall comply with all Closure and Post-Closure Maintenance Specifications listed in Section G of the SPRRs dated April 2016.

## F. FINANCIAL ASSURANCE

1. By **1 June 2018**, pursuant to Title 27, the Discharger shall establish an irrevocable acceptable financial mechanism as specified in Title 27, Section 22228 in the amount of **\$3,566,026 in 2016 dollars for closure and post-closure fund** with the Central Valley Water Board named as beneficiary. The issuing institution shall become liable under the terms of the financial mechanism if the Executive Officer determines that the Discharger has failed or is failing to perform closure or post-closure maintenance or corrective action activities as guaranteed by the mechanism in a timely manner. Prior to any exercise of remedies, Central Valley Water Board staff will provide the Discharger with written notice of the Discharger's noncompliance with any provisions of these WDRs.
2. By **1 June** of each year, the Discharger shall submit a report to the Central Valley Water Board that reports the balance of both the closure and corrective action funds or the amounts of the Guarantees and the adjustments to account for inflation.
3. The Discharger shall comply with all Standard Financial Assurance Specifications listed in Section H of the SPRRs dated April 2016.

## G. MONITORING SPECIFICATIONS

1. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, and in accordance with Monitoring and Reporting Program (MRP) R5-2017-0077, and the Standard Monitoring Specifications listed in Section I of the SPRRs dated April 2016.
2. The Discharger shall, for any mining unit in a corrective action monitoring program, comply with the corrective action monitoring program provisions of Title 27, MRP R5-2017-0077, and the Standard Monitoring Specifications listed in Section I of SPRRs dated April 2016.
3. The Discharger shall comply with the Water Quality Protection Standards for surface water and groundwater as specified in this Order, MRP R5-2017-0077, and the SPRRs dated April 2016.
4. The concentrations of the constituents of concern in waters passing the Point of Compliance (defined pursuant to Title 27, section 20164 as a vertical surface located at the hydraulically downgradient limit of the mining unit that extends through the uppermost aquifer underlying the unit) shall not exceed the concentration limits established pursuant to MRP R5-2017-0077.
5. For each monitoring event, the Discharger shall determine whether the mining unit is in compliance with the Water Quality Protection Standards using procedures specified in MRP R5-2017-0077 and the Standard Monitoring Specifications in Section I of the SPRRs dated April 2016.
6. The Discharger shall comply with all Standard Monitoring Specifications and Response to a Release specifications listed in Sections I and J of the SPRRs dated April 2016.

## H. PROVISIONS

1. The Discharger shall comply with the Standard Provisions and Reporting Requirements, dated April 2016, which are attached hereto and made part of this Order by reference. The Standard Provisions and Reporting Requirements contain important provisions and requirements with which the Discharger must comply. A violation of any of the Standard Provisions and Reporting Requirements is a violation of these waste discharge requirements.
2. Pursuant to Water Code section 13267, the Discharger shall comply with Monitoring and Reporting Program R5-2017-0077, which is attached to and made part of this Order. A violation of Monitoring and Reporting Program R5-2017-0077 is a violation of these waste discharge requirements.
3. The Discharger shall maintain a copy of this Order at the facility and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.

4. The Discharger shall maintain legible records of the volume of leachate discharged into the Quarry Pit. These records shall be available for review by representatives of the Central Valley Water Board and of the State Water Resources Control Board, and copies of these records shall be sent to the Central Valley Water Board upon request.
5. The Discharger shall comply with all applicable provisions of Title 27 that are not specifically referred to in this Order.
6. The Discharger shall immediately notify the Central Valley Water Board of any flooding, equipment failure, slope failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.
7. In the event of any change in control or ownership of the facility or disposal areas, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office. To assume operation as Discharger under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory paragraph of General Provision K.2.e in the Standard Provisions and Reporting Requirements and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved by the Executive Officer.
8. The Discharger shall provide proof to the Central Valley Water Board **within sixty days after completing final closure** that the deed to the facility property, or some other instrument that is normally examined during title search, has been modified to include, in perpetuity, a notation to any potential purchaser of the property stating that:
  - a. The parcel has been used for disposal of wastes.
  - b. Land use options for the parcel are restricted in accordance with post-closure land uses set forth in any post-closure plan (if applicable).
  - c. In the event that the Discharger defaults on carrying out either any corrective action needed to address a release, groundwater monitoring, or any post-closure maintenance (if applicable), then the responsibility for carrying out such work falls to the property owner.
9. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code sections

6735, 7835, and 7835.1. As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

10. The following reports and work plans shall be submitted pursuant to Section 13267 of the California Water Code and shall be prepared by a California-registered civil engineer or certified engineering geologist:

<u>Task</u>	<u>Compliance Date</u>
<b>A. Updated Sample Collection and Analyses Plan</b>  Submit an updated Sample Collection and Analyses Plan for groundwater, surface water, and leachate water quality monitoring and reporting.	<b>31 August 2017</b>
<b>B. Workplan for an Additional Groundwater Monitoring Well and an Additional Surface Water Sampling Point</b>  Submit a work plan to install an additional detection groundwater monitoring well at CDK-1. The workplan shall also identify an additional surface water monitoring point in the drainage west and downstream of the Calaveras Material Inc. settling pond.	<b>31 August 2017</b>
<b>C. CKD-3 Design Report with Construction Drawings and Specifications and Construction Quality Assurance Plans</b>  Submit a design report with construction drawings and specifications and construction quality assurance plan for review and approval (see all Construction Specifications in Section D, above and Section F of the SPRRs.). The report shall include a proposal for construction of a new compliance groundwater monitoring well. The Discharger will submit updates 60 and 120 days after the adoption of this Order.	<b>Within 180 days after the adoption of this Order</b>
<b>D. CKD-1 Leachate Management Plan</b>  Submit the results of CKD-1 investigations and an alternate leachate management plan.	<b>Within 180 days after the adoption of this order</b>

<u>Task</u>	<u>Compliance Date</u>
<b>E. Complete Closure of MU CKD-3 and Submit Final Closure Construction Quality Assurance Report</b>  Complete closure of CKD-3 and submit a construction quality assurance (CQA) report for review and approval upon completion demonstrating construction was conducted in accordance with approved construction plans (see Standard Construction Specifications in Section F of the SPRRs).	<b>31 December 2018</b>
<b>F. Final Closure and Post-Closure Maintenance Plan</b>  Submit an Updated Final Closure and Post-Closure Maintenance Plan including inspection, maintenance, and monitoring of the facility during the post-closure maintenance period, a post-closure maintenance cost estimate for the entire facility including Calaveras Materials Inc., and proof of the post-closure fund mechanism with the Central Valley Water Board listed as a beneficiary as detailed in Financial Assurances F.1. The plan will be implemented for a minimum period of 30 years or until the waste no longer poses a threat to water quality, whichever is greater.	<b>31 March 2019</b>

11. The Central Valley Water Board will review this Order periodically and may revise requirements when necessary.
12. This Order shall take effect upon the date of adoption.
13. The Discharger shall comply with all General Provision listed in Section K of the SPRRs dated April 2016.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 9 June 2017.

ORIGINAL SIGNED BY  
PAMELA C. CREEDON, Executive Officer

NJV/WMH

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2017-0077

FOR

LEHIGH SOUTHWEST CEMENT COMPANY0077  
CALAVERAS CEMENT COMPANY  
CALAVERAS CEMENT PLANT  
CALAVERAS COUNTY

This monitoring and reporting program (MRP) is issued to Lehigh Southwest Cement Company and Calaveras Cement Company (Discharger), pursuant to California Water Code section 13267 and incorporates requirements for groundwater and surface water monitoring and reporting; facility monitoring, maintenance, and reporting; and financial assurances reporting contained in California Code of Regulations, Title 27 (hereafter Title 27), Waste Discharge Requirements (WDRs) Order R5-2017-0077, and the Standard Provisions and Reporting Requirements dated April 2016 (SPRRs).

Compliance with this MRP is ordered by the WDRs and the Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Central Valley Water Board or the Executive Officer. Failure to comply with this MRP, or with the SPRRs, constitutes noncompliance with the WDRs and with Water Code Section 13267, which can result in the imposition of civil monetary liability.

**A. MONITORING**

The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater and surface water in accordance with Standard Monitoring Specifications in SPRRs.

All compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard. All detection monitoring program groundwater monitoring wells, leachate, Quarry Pit water, and surface water monitoring points shall be sampled and analyzed for monitoring parameters and constituents of concern (COCs) as indicated and listed in Tables 1 through 5.

The Discharger shall use USEPA test methods with the lowest achievable detection limit for that constituent taking any matrix interferences into account. The reporting limit shall be no higher than the practical quantitation limit. The Discharger shall report all trace concentrations that are between the detection limit and the practical quantitation limit. All metals analyses shall be for dissolved metals.

The monitoring program of this MRP includes:

<u>Section</u>	<u>Monitoring Program</u>
A.1	Groundwater Monitoring
A.2	Surface Water Monitoring
A.3	LCRS Monitoring and Annual LCRS Testing
A.4	Facility Monitoring

## 1. **Groundwater Monitoring**

The Discharger shall operate and maintain a groundwater detection monitoring system that complies with the applicable provisions of Title 27, sections 20415 and 20420. The detection monitoring system shall be certified by a California-licensed professional civil engineer or geologist as meeting the requirements of Title 27.

The current groundwater monitoring network consists of the following:

<u>Well</u>	<u>Status</u>	<u>Zone</u>	<u>Units Being Monitored</u>
MW-9	Background	Shallow	CKD-1
MW-4	Detection/Corrective Action	Shallow	CKD-1
MW-6	Detection/Corrective Action	Deep	CKD-1
MW-7	Background	Shallow	CKD-3
MW-8	Detection/Corrective Action	Shallow	CKD-3

Groundwater monitoring well MW-2 near CKD-1 and piezometers PZ-1 through PZ-7 are used to measure groundwater elevation. Groundwater monitoring well MW-3 is not being utilized in the current groundwater monitoring network.

The current groundwater monitoring detection monitoring system does not meet the requirements of Title 27, sections 20415 and 20420. The current groundwater detection monitoring systems for CKD-1 is inadequate to evaluate the distribution of potential contamination in groundwater. The Provisions Section of the WDRs requires the Discharger to install an additional detection groundwater monitoring well in a location that will allow more accurate spatial assessment of groundwater flow, gradient, and water quality. The Discharger shall add all new monitoring points to the site groundwater monitoring network.

Groundwater samples shall be collected semiannually from the background wells, detection monitoring wells, and any additional monitoring points added as part of the approved groundwater monitoring system. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan. Depth to groundwater shall be

measured to the nearest 0.01 feet.

Samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in the following table:

<b>Table 1: Groundwater Monitoring</b>			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<u>Field Parameters</u>			
Groundwater Elevation	Ft. & hundredths, MSL	Quarterly <sup>1</sup>	Semiannually
Temperature	°F	Semiannually	Semiannually
Electrical Conductivity	umhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
Turbidity	NTU	Semiannually	Semiannually
<u>Monitoring Parameters</u>			
Lab pH	pH units	Semiannually	Semiannually
Total Dissolved Solids	mg/L	Semiannually	Semiannually
Total Alkalinity	mg/L	Semiannually	Semiannually
Chemical Oxygen Demand	mg/L	Semiannually	Semiannually
Chloride	mg/L	Semiannually	Semiannually
Sulfate	mg/L	Semiannually	Semiannually
Calcium	mg/L	Semiannually	Semiannually
Sodium	mg/L	Semiannually	Semiannually
Magnesium	mg/L	Semiannually	Semiannually
Aluminum	µg/L	Semiannually	Semiannually
Cadmium	µg/L	Semiannually	Semiannually
Chromium, Total	µg/L	Semiannually	Semiannually
Chromium, Hexavalent	µg/L	Semiannually	Semiannually
Copper	µg/L	Semiannually	Semiannually
Iron	µg/L	Semiannually	Semiannually
Lead	µg/L	Semiannually	Semiannually
Mercury	µg/L	Semiannually	Semiannually
Nickel	µg/L	Semiannually	Semiannually
Manganese	µg/L	Semiannually	Semiannually
Molybdenum	µg/L	Semiannually	Semiannually

<sup>1</sup> The Discharger shall measure the groundwater elevation in each well and each piezometer **quarterly**, determine groundwater flow direction, and estimate groundwater flow rates in the uppermost water bearing zone and in any zones of perched water and in any additional portions of the zone of saturation monitored. The results shall be reported semiannually, including the times of expected highest and lowest elevations of the water levels in the wells, pursuant to Title 27, section 20415(e)(15).

## 2. Surface Water Monitoring

The Discharger shall operate a surface water detection monitoring system for any facility where runoff from mining unit areas flows or could flow to waters of the United States. The monitoring system shall comply with the applicable provisions of Title 27, sections 20415 and 20420.

- a. Runoff from CKD-1 areas flows to plunge pools at the base of the unit and periodically discharges into the Calaveritas Creek.
- b. Runoff from CKD-3 flows to a retention basin at the toe of the unit that periodically discharges into the unnamed drainage.

The current surface water monitoring points for the facility are:

<u>Monitoring Points</u>	<u>Status/Location</u>
SW-1	Background/Upstream from the Site
SW-2	Detection/Downstream from CKD-1
SW-3	Detection/Quarry Pit water
SW-4	Detection/Retention Pond at the toe of CKD-3
SW-5	Background/Upstream from CKD3
SW-6	Detection/Calaveritas Creek downstream from CKD-3 and upstream from CKD-1

The discharger shall identify another surface water monitoring point in the unnamed drainage downstream from the Calaveras Material Inc. settling pond and add it to the surface water monitoring network.

For surface water detection monitoring, a sample shall be collected at each monitoring point location and analyzed for the monitoring parameters and constituents in accordance with the methods and frequency specified in Table 3.

**Table 3: Surface Water Monitoring**

<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<u>Field Parameters</u>			
Temperature	°F	Semiannually	Semiannually
Electrical Conductivity	umhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
Turbidity	NTU	Semiannually	Semiannually
<u>Monitoring Parameters</u>			
Lab pH	pH units	Semiannually	Semiannually
Total Dissolved Solids	mg/L	Semiannually	Semiannually
Total Alkalinity	mg/L	Semiannually	Semiannually
Chemical Oxygen Demand	mg/L	Semiannually	Semiannually
Aluminum	µg/L	Semiannually	Semiannually
Cadmium	µg/L	Semiannually	Semiannually
Chromium, Total	µg/L	Semiannually	Semiannually
Chromium, Hexavalent	µg/L	Semiannually	Semiannually
Copper	µg/L	Semiannually	Semiannually
Iron	µg/L	Semiannually	Semiannually
Lead	µg/L	Semiannually	Semiannually
Mercury	µg/L	Semiannually	Semiannually
Nickel	µg/L	Semiannually	Semiannually
Manganese	µg/L	Semiannually	Semiannually
Molybdenum	µg/L	Semiannually	Semiannually

### **3. LCRS Monitoring and Annual LCRS Testing**

**LCRS Monitoring:** The Discharger shall operate and maintain leachate collection and removal system (LCRS) sumps, record removed leachate volumes, and conduct annual testing of each LCRS component in accordance with Title 27 and this monitoring program.

The Discharger will develop an appropriate CKD-1 leachate management strategy to be submitted for Board approval within 180 days after adoption of the WDRs. In the interim period for 180 days after these WDRs are adopted, the Discharger will be required to monitor the level of leachate in the CKD-1 LCRS, but will not be required to pump or transfer the accumulated leachate into containers for disposal.

The current and future LCRS leachate sump monitoring points are:

<u>Monitoring Point</u>	<u>Unit Where Sump is Located</u>
CKD-1 Primary	CKD-1
CKD-3	CKD-3 after closure

All LCRS sumps shall be inspected monthly for the presence of leachate, and flow shall be recorded in accordance with the following table. Leachate shall be analyzed as specified below.

<b>Table 5: LCRS Monitoring</b>			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<u>Field Parameters</u>			
Presence of Leachate	observation	Monthly	Semiannually
Leachate Volume <sup>1</sup>	gallons/day	Monthly	Semiannually
Electrical Conductivity	umhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
<u>Monitoring Parameters</u>			
Total Dissolved Solids	mg/L	Semiannually	Semiannually
Total Alkalinity	mg/L	Semiannually	Semiannually
Chemical Oxygen Demand	mg/L	Semiannually	Semiannually
Aluminum	µg/L	Semiannually	Semiannually
Cadmium	µg/L	Semiannually	Semiannually
Chromium, Total	µg/L	Semiannually	Semiannually
Chromium, Hexavalent	µg/L	Semiannually	Semiannually
Copper	µg/L	Semiannually	Semiannually
Iron	µg/L	Semiannually	Semiannually
Lead	µg/L	Semiannually	Semiannually
Mercury	µg/L	Semiannually	Semiannually
Nickel	µg/L	Semiannually	Semiannually
Manganese	µg/L	Semiannually	Semiannually
Molybdenum	µg/L	Semiannually	Semiannually

<sup>1</sup> Volume of removed leachate gallons per day from the LCRS.

**Annual LCRS Testing:** All LCRSs shall be tested annually pursuant to Title 27, section 20340(d) to demonstrate proper operation. The Discharger proposes an alternative LCRS inspection and testing approach and will submit it with the CKD-3 design plans. This approach will have the goals of regularly assessing the proper function of an LCRS, identifying any deficiencies, correcting any deficiencies, and reporting this information. The results of these tests shall be reported to the Central Valley Water Board in the Annual Monitoring Report and shall include comparisons with earlier tests made under comparable conditions.

#### **4. Facility Monitoring**

##### **a. Annual Facility Inspection**

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess repair and maintenance needed for liner systems; LCRS pumps, piping and control systems; drainage control

systems; groundwater monitoring wells; unsaturated zone monitoring systems; and shall assess preparedness for winter conditions including but not limited to the required mining unit capacity and erosion and sedimentation control. The Discharger shall take photos of any problems areas before and after repairs. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. Annual facility inspection reporting shall be submitted as required in Section B.3 of this MRP.

b. **Major Storm Events**

The Discharger shall inspect all precipitation, diversion, and drainage facilities and all mining unit berms for damage **within 7 (seven) days** following major storm events capable of causing damage or significant erosion. The Discharger shall take photos of any problems areas before and after repairs. Necessary repairs shall be completed **within 30 days** of the inspection. Notification and reporting requirements for major storm events shall be conducted as required in Section B.4 of this MRP.

**B. REPORTING**

The Discharger shall submit the following reports in accordance with the required schedule:

**Reporting Schedule**

<u>Section</u>	<u>Report</u>	<u>End of Reporting Period</u>	<u>Due Date</u>
B.1	Semiannual Monitoring Report	30 June, 31 December	<b>1 August, 1 February</b>
B.2	Annual Monitoring Report	31 December	<b>1 February</b>
B.3	Annual Facility Inspection Report	31 October	<b>15 November</b>
B.4	Major Storm Event Reporting	Continuous	<b>7 days from damage discovery</b>
B.5	Financial Assurances Report	31 December	<b>1 June</b>

**Reporting Requirements**

The Discharger shall submit monitoring reports **semiannually** with the data and information as required in this Monitoring and Reporting Program and as required in WDRs Order R5-2017-0077 and the Standard Provisions and Reporting Requirements (particularly Section I: "Standard Monitoring Specifications" and Section J: "Response to a Release").

In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the

units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Data shall also be submitted in a digital format.

Field and laboratory tests shall be reported in each monitoring report. Semiannual and annual monitoring reports shall be submitted to the Central Valley Water Board in accordance with the above schedule for the calendar period in which samples were taken or observations made. In addition, the Discharger shall enter all monitoring data and monitoring reports into the online Geotracker database as required by Division 3 of Title 27.

The results of **all monitoring** conducted at the site shall be reported to the Central Valley Water Board in accordance with the reporting schedule above for the calendar period in which samples were taken or observations made.

The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of 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 throughout the life of the facility. Such records shall be legible and shall show the following for each sample:

- a) Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;
- b) Date, time, and manner of sampling;
- c) Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;
- d) Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
- e) Calculation of results; and
- f) Results of analyses, and the MDL and PQL for each analysis. All peaks shall be reported.

### Required Reports

1. **Semiannual Monitoring Report:** Monitoring reports shall be submitted semiannually and are due on **1 August** and **1 February**. Each semiannual monitoring report shall contain at least the following:
  - a) For each groundwater monitoring point addressed by the report, a description of:
    - 1) The time of water level measurement;

- 2) The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;
  - 3) The method of purging used to stabilize water in the well bore before the sample is taken including the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; results of pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water;
  - 4) The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and
  - 5) A statement that the sampling procedure was conducted in accordance with the approved Sample Collection and Analysis Plan.
- b) A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.
  - c) The estimated quarterly groundwater flow rate and direction in the uppermost aquifer, in any zones of perched water, and in any additional zone of saturation monitored based upon water level elevations taken prior to the collection of the water quality data submitted in the report [Title 27, section 20415(e)(15)].
  - d) Cumulative tabulated monitoring data for all monitoring points and constituents for groundwater, LCRS/leachate, surface water, and the Quarry Pit. Concentrations below the laboratory reporting limit shall not be reported as "ND" unless the reporting limit is also given in the table. Otherwise they shall be reported "<" the reporting limit (e.g., <0.10). Units shall be as required in Tables 1 through 5 unless specific justification is given to report in other units. Refer to the SPRRs Section I "Standard Monitoring Specifications" for requirements regarding MDLs and PQLs.
  - e) Laboratory statements of results of all analyses evaluating compliance with requirements.
  - f) An evaluation of the concentration of each monitoring parameter as compared to the current concentration limits, and the results of any required verification testing for constituents exceeding a concentration limit. Report any actions taken under Section J: Response to a Release in the SPRRs for verified exceedances of a concentration limit for wells/constituents not already in corrective action monitoring.
  - g) A summary of all waste discharge monitoring.
  - h) A summary of all Facility Monitoring including rainfall data for the reporting period required in Section A.5. of this MRP. Rainfall data can be obtained from an onsite rain gauge or from a publicly available National Weather Service station or equivalent.
2. **Annual Monitoring Report:** The Discharger shall submit an Annual Monitoring Report to the Central Valley Water Board by **1 February** covering the reporting

period of the previous monitoring year. If desired, the Annual Monitoring Report may be combined with the second semiannual report, but if so, shall clearly state that it is both a semi-annual and annual monitoring report in its title. Each Annual Monitoring Report shall contain the following additional information beyond what is required for semiannual monitoring reports:

- a) All monitoring parameters shall be graphed to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous five calendar years. Each such graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
- b) All historical monitoring data for which there are detectable results, including data for the previous year, shall be submitted in tabular form in a digital file format such as a computer disk. The Central Valley Water Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [Title 27, section 20420(h)], that facilitates periodic review by the Central Valley Water Board.
- c) Hydrographs of each well showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be prepared quarterly and submitted annually.
- d) A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.
- e) A written summary of the monitoring results, indicating any changes made or observed since the previous Annual Monitoring Report.
- f) The results of the annual testing of the LCRS components.
- g) Updated concentration limits for each monitoring parameter at each monitoring well based on the new background data set.

3. **Annual Facility Inspection Reporting:** By **15 November** of each year, the Discharger shall submit a report describing the results of the inspection and the repair measures implemented, preparations for winter, and include photographs of any problem areas and the repairs.
4. **Major Storm Event Reporting:** The Discharger shall notify Central Valley Water Board staff within **7 days** after major storm events of any damage or significant erosion and report any needed repairs within **14 days** of completion of the repairs, including photographs of the problem and the repairs.

5. **Financial Assurances Report:** By 1 June of each year, the Discharger shall submit a report to the Central Valley Water Board that reports the balance of both the closure and corrective action funds or the amounts of the Guarantees and the adjustments to account for inflation in accordance with Title 27 Section 22236. Refer to Financial Assurances Specifications F.1 through F.3 of the WDRs.

## C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

### 1. Water Quality Protection Standard Report

For each mining unit, the Water Quality Protection Standard shall consist of all COCs, the concentration limit for each constituent of concern, the verification retesting procedure to confirm measurably significant evidence of a release, the point of compliance, and all water quality monitoring points for each monitored medium.

The Water Quality Protection Standard for naturally occurring waste constituents consists of the COCs, the concentration limits, and the point of compliance and all monitoring points. Any proposed changes to the Water Quality Protection Standard other than annual update of the concentration limits shall be submitted in a report for review and approval.

The report shall:

- a. Identify **all distinct bodies of surface and ground water** that could be affected in the event of a release from a mining unit or portion of a unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.
- b. Include a map showing the monitoring points and background monitoring points for the surface water monitoring program, groundwater monitoring program, and the unsaturated zone monitoring program. The map shall include the point of compliance in accordance with Title 27, section 20405.
- c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).
- d. Include a proposed statistical method for calculating concentration limits for monitoring parameters and constituents of concern that are detected in 10% or greater of the background data (naturally-occurring constituents) using a statistical procedure from Title 27, section 20415(e)(8)(A-D)] or section 20415(e)(8)(E).
- e. Include a retesting procedure to confirm or deny measurably significant evidence of a release pursuant to Title 27, section 20415(e)(8)(E) and section 20420(j)(1-3).

The Water Quality Protection Standard shall be certified by a California-registered civil engineer or geologist as meeting the requirements of Title 27. If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to mining activities at the site, the Discharger may request modification of the Water Quality Protection Standard.

The Discharger submitted Water Quality Protection Standard (WQPS) reports on 31 July 2000, 31 March 2005, and 15 September 2006. The Water Quality Protection Standard shall be updated annually for each monitoring well using new and historical monitoring data, and submitted with the annual report.

## **2. Monitoring Parameters**

Monitoring parameters are a select group of constituents that are monitored during each monitoring event that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a mining unit. The monitoring parameters for all mining units are those listed in the tables in Section A of this MRP specified monitored medium.

## **3. Concentration Limits**

For a naturally occurring constituent of concern, the concentration limit for each constituent of concern shall be determined as follows:

- a. By calculation in accordance with a statistical method pursuant to Title 27, section 20415(e)(8); or
- b. By an alternate statistical method meeting the requirements of Title 27, section 20415(e)(8)(E).

The Discharger submitted Water Quality Protection Standard (WQPS) reports on 31 July 2000, 31 March 2005, and 15 September 2006. Data from background wells and surface water locations were used to calculate WQPS as follows: MW-9 for CKD-1, MW-7 for CKD-3 and SW-1 for surface water. These WQPS need to be updated annually. WQPS for COCs which have been added to the monitoring program need to be established using an appropriate statistical method as specified in C.1.d.

The most recent concentration limits for select parameters as reported in the 2016 *Annual Monitoring Report* from background wells and background surface water sampling location were as follows:

Well or surface water sampling point	pH (Std units)	EC (umhos/cm)	COD (mg/L)	TDS (mg/L)	Aluminum (ug/L)	Total Chromiu m (ug/L)	Hexavalent Chromium (ug/L)
MW-9	6.5 - 8.4	679	11	559	142	3	8
MW-7	6.5 - 8.4	700	16	255	111	2	7
SW-1	6.5 - 8.4	373	9	213	161	5	7

#### **4. Retesting Procedures for Confirming Evidence of a Release**

If monitoring results indicate measurably significant evidence of a release, as described in Standard Monitoring Specification I.43 of the SPRRs, then:

- a. For analytes that are detected in less than 10% of the background samples (such as non-naturally occurring constituents), the Discharger shall use the non-statistical retesting procedure required in Standard Monitoring Specification I.44 of the SPRRs.
- b. For analytes that are detected in 10% or greater of the background samples (naturally occurring constituents), the Discharger shall use one of the statistical retesting procedures as required in Standard Monitoring Specification I.45 of the SPRRs.

#### **5. Point of Compliance**

The point of compliance for the water standard at each mining unit is a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the unit. The following are monitoring locations at the point of compliance:

<u>Cell or Module</u>	<u>Point of Compliance Monitoring Wells</u>
CKD-1	MW-4
CKD-3	MW-8

MW-8 is completed within CKD material. A new hydraulically downgradient point of compliance for CKD-3 will be proposed in the CKD-3 design report after the limits of CKD-3 are established.

#### **6. Compliance Period**

The compliance period for each mining unit shall be the number of years equal to the active life of the unit plus the closure period. The compliance period is the minimum period during which the Discharger shall conduct a water quality monitoring program subsequent to a release from the mining unit. The

compliance period shall begin anew each time the Discharger initiates an evaluation monitoring program [Title 27, section 20410].

## 7. Monitoring Points

A monitoring point is a well, device, or location specified in the waste discharge requirements, which monitoring is conducted and at which the water quality protection standard applies. The monitoring points for each monitored medium are listed in Section A of this MRP.

## D. TRANSMITTAL LETTER FOR ALL REPORTS

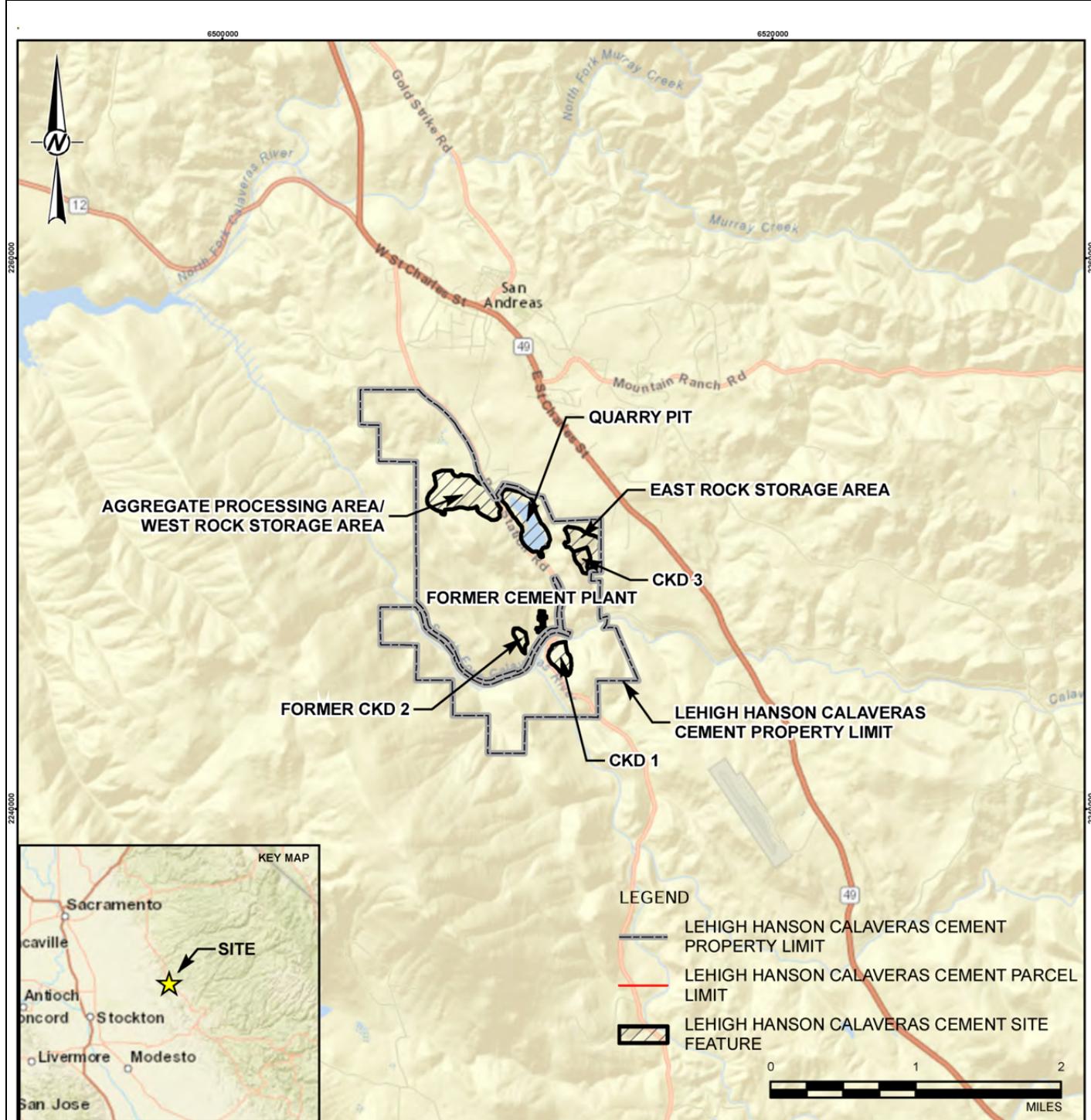
A transmittal letter explaining the essential points shall accompany each report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted, and if the violations were corrected. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter. The transmittal letter shall also state that a discussion of any violations found since the last report was submitted, and a description of the actions taken or planned for correcting those violations, including any references to previously submitted time schedules, is contained in the accompanying report. The transmittal letter shall contain a statement by the discharger, or the discharger's authorized agent, under penalty of perjury, that to the best of the signer's knowledge the report is true, accurate, and complete.

The Discharger shall implement the above monitoring program on the effective date of this Program.

Ordered by: ORIGINAL SIGNED BY  
PAMELA C. CREEDON, Executive Officer

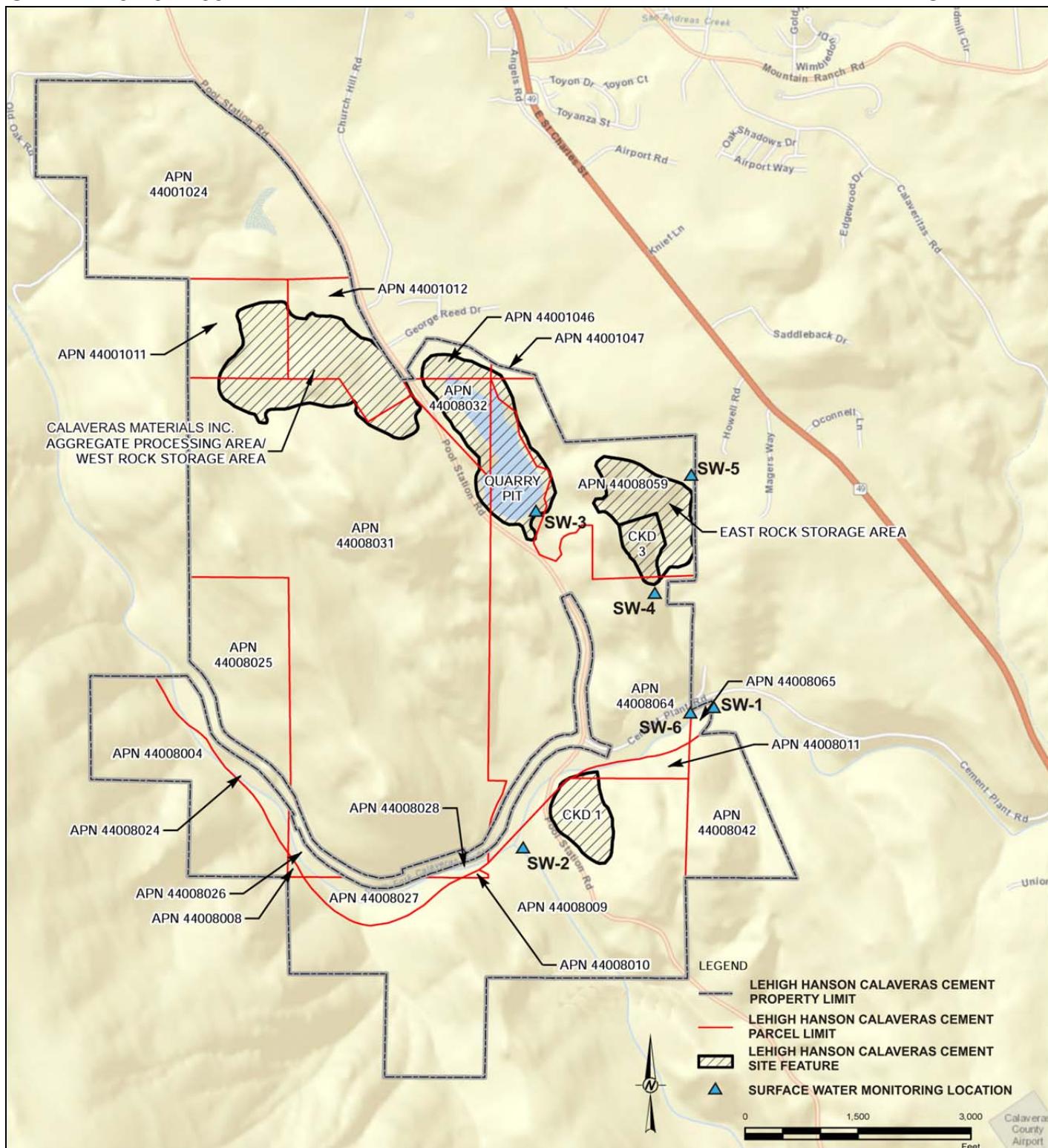
9 June 2017  
(Date)

NJV/WMH



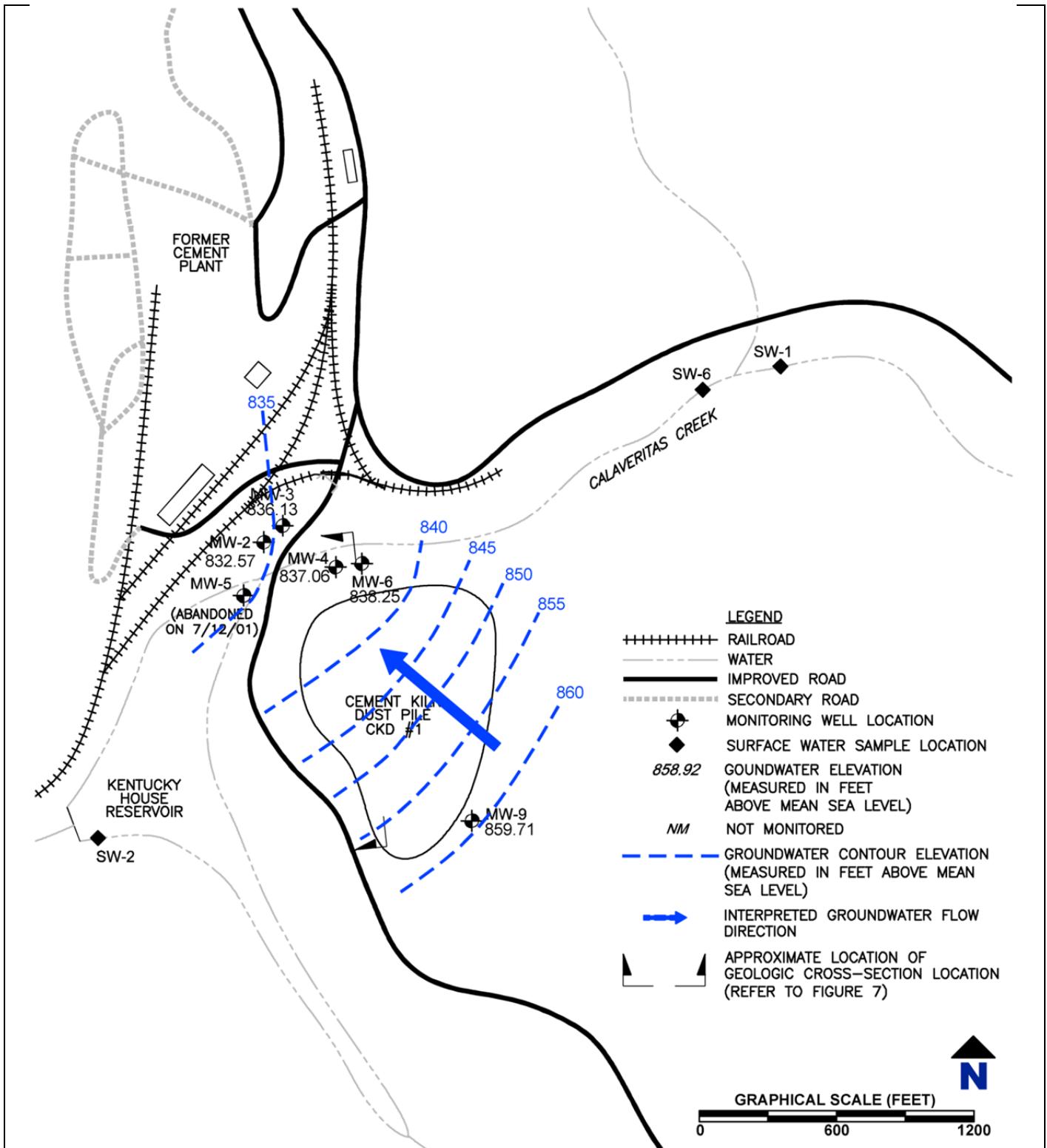
**Drawing Reference:**  
Report of Waste Discharge  
Golder Associates  
Figure 1: Site Location Map, 2016-12-07

**SITE LOCATION**  
Lehigh Southwest Cement Company and  
Calaveras Cement Company  
Calaveras Cement Plant  
Calaveras County



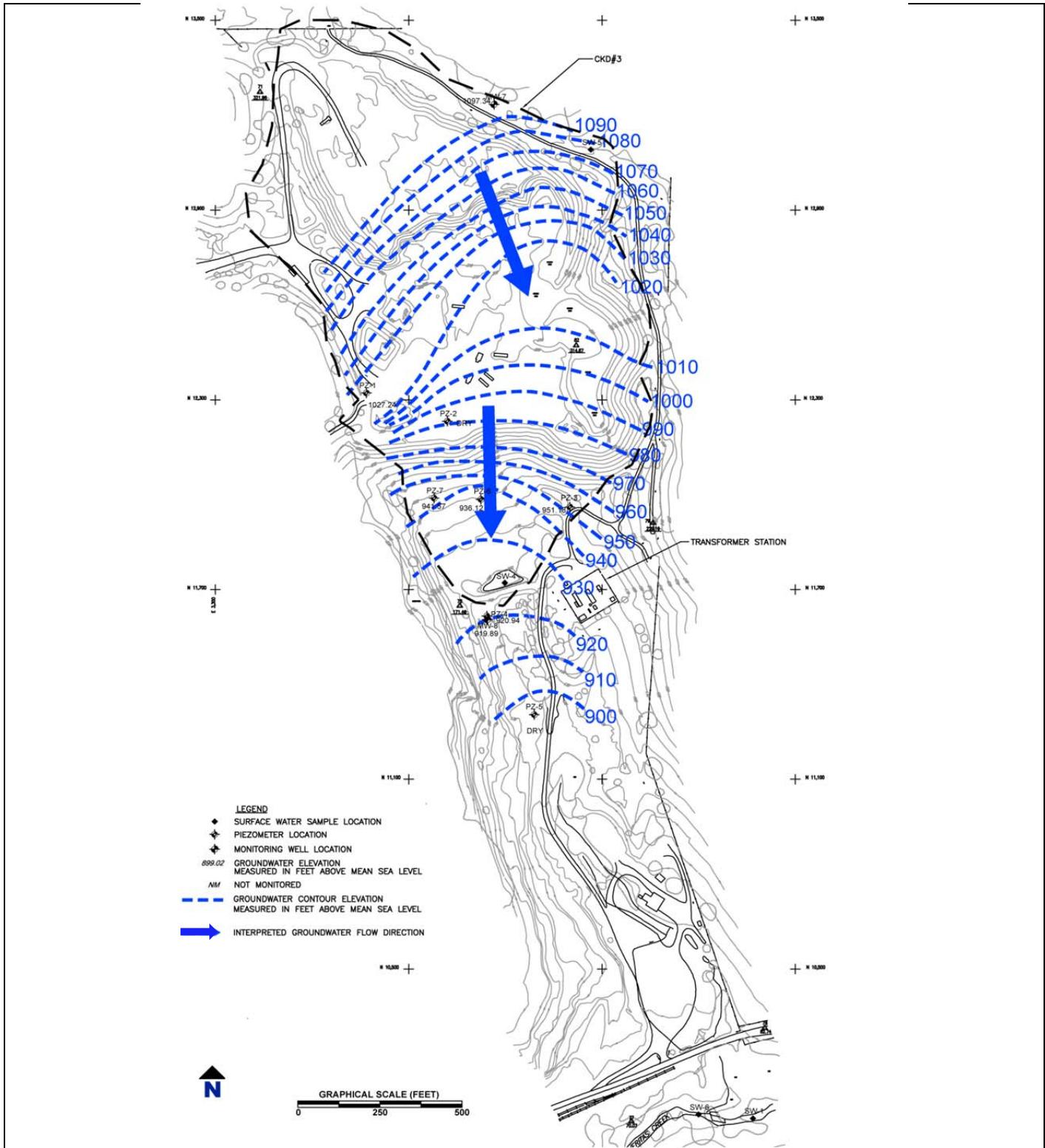
**Drawing Reference:**  
Report of Waste Discharge  
Golder Associates  
Figure 2: Site Map, 2016-12-07

**SITE MAP**  
Lehigh Southwest Cement Company and  
Calaveras Cement Company  
Calaveras Cement Plant  
Calaveras County

**Drawing Reference:**

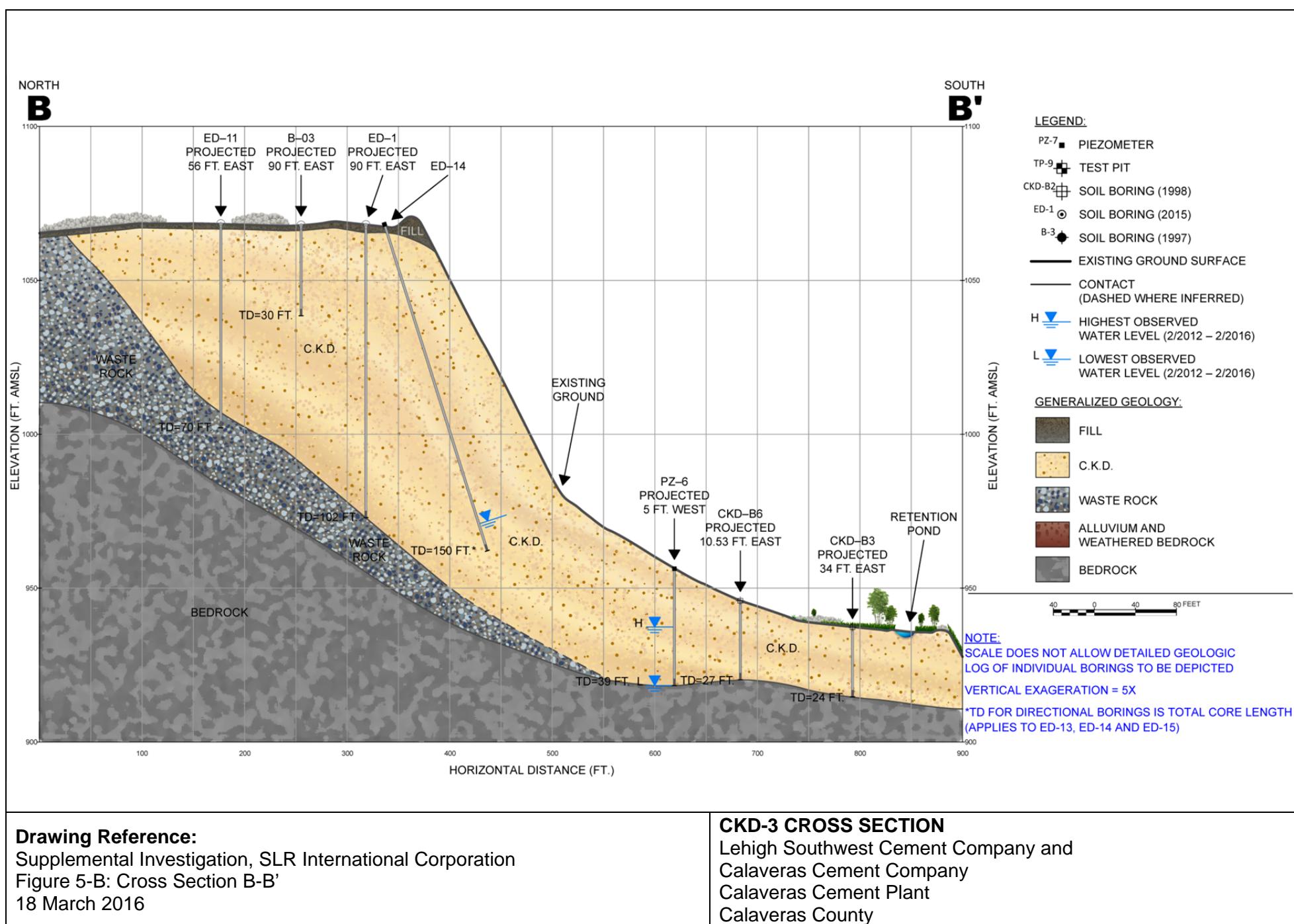
Second Semiannual and Annual Monitoring Report  
 SLR International Corporation  
 Figure 5: Groundwater Contour Map CKD-1  
 September 2016

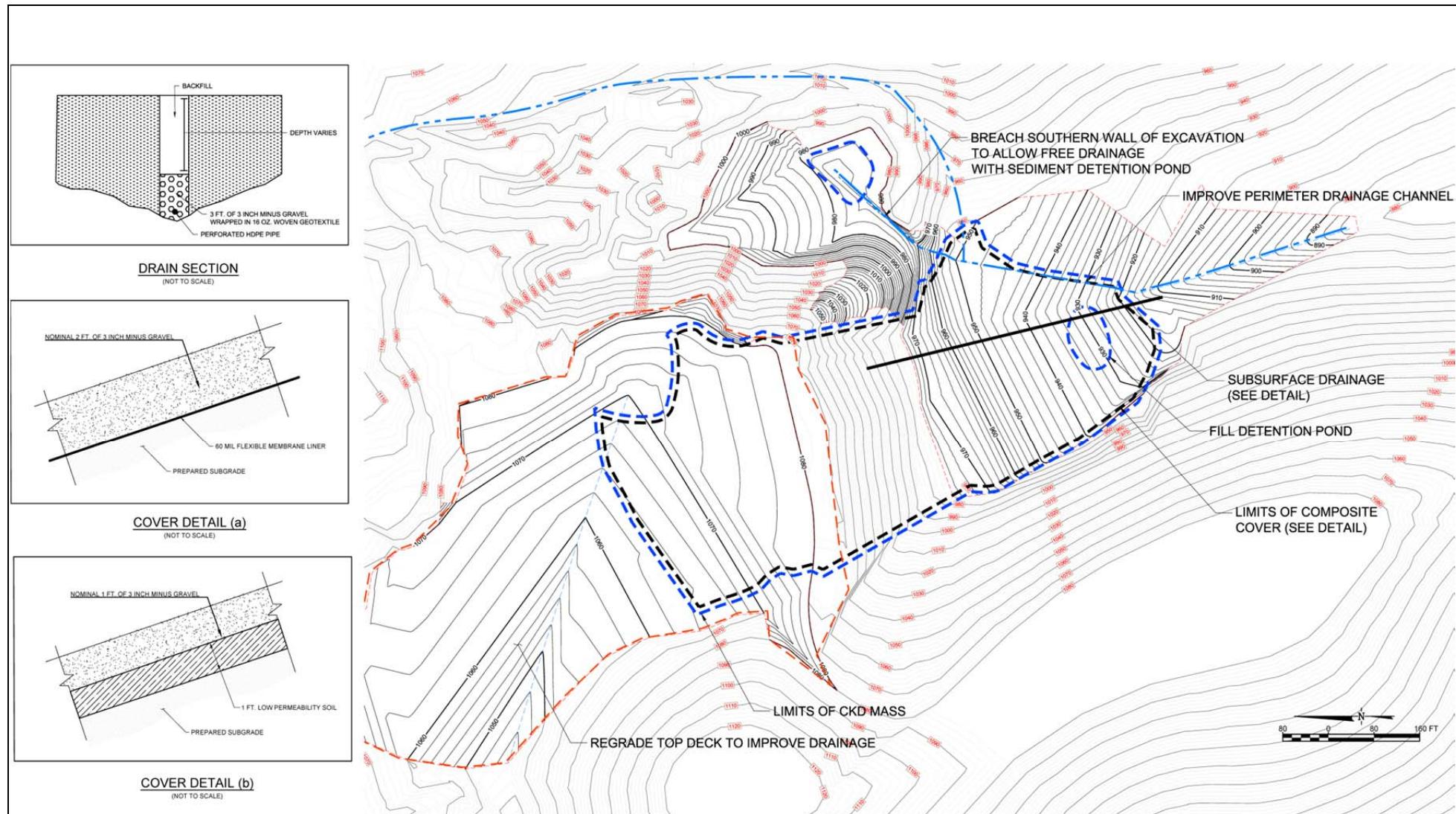
**CKD-1 GROUNDWATER CONTOURS AND GROUNDWATER AND SURFACE WATER MONITORING POINTS**  
 Lehigh Southwest Cement Company and Calaveras Cement Company  
 Calaveras Cement Plant  
 Calaveras County

**Drawing Reference:**

Second Semiannual and Annual Monitoring Report  
 SLR International Corporation  
 Figure 6: Groundwater Contour Map CKD-3  
 September 2016

**CKD-3 GROUNDWATER CONTOURS AND GROUNDWATER AND SURFACE WATER MONITORING POINTS**  
 Lehigh Southwest Cement Company and Calaveras Cement Company  
 Calaveras Cement Plant  
 Calaveras County





**Drawing Reference:**  
**CKD-3 EFS**  
**SLR International Corporation**  
**Figure 8: Alternative 4: Regrade and Cover with Surface Drainage**  
**21 June 2016**

**CKD-3 PRELIMINARY CLOSURE DESIGN: REGRADE AND COVER WITH SURFACE AND SUBSURFACE DRAINAGE**  
Lehigh Southwest Cement Company and  
Calaveras Cement Company  
Calaveras Cement Plant, Calaveras County

## INFORMATION SHEET

ORDER R5-2017-0077

LEHIGH SOUTHWEST CEMENT COMPANY AND CALAVERAS CEMENT COMPANY  
CALAVERAS CEMENT PLANT

CLOSURE AS CORRECTIVE ACTION AND POST-CLOSURE MAINTENANCE,  
CALAVERAS COUNTY

Pursuant to California Code of Regulations Title 27 (CCR T27) this Waste Discharge Requirements (WDR) Order revision regulates:

1. Final closure of the remaining cement kiln dust pile as a corrective action program
2. Active mining of waste rock for saleable aggregate
3. Post-closure monitoring and maintenance of the entire facility

Lehigh Southwest Cement Company and Calaveras Cement Company (hereafter jointly Discharger or Lehigh), owns and operates the Calaveras Cement Company (site) located on a 250-acre property about 2.5 miles south of San Andreas, CA. The former cement company quarried limestone from an open pit mine (Quarry Pit) and produced cement for approximately 50 years. While the facility was in operation from 1926 to 1982, cement kiln dust (CKD) and waste rock were discharged to three cement kiln dust piles (CKD-1, CKD-2, CKD-3) and two waste rock piles (West Rock Storage Area & East Rock Storage Area). Currently, the facility consists of four mining units (CKD-1 closed in 1998, CKD-3 in corrective action, and East and West Waste Rock Storage Areas) and an active waste rock mining operation Calaveras Materials Inc., a subsidiary of Lehigh Hanson.

Highly alkaline cement kiln dust generated during the production of cement contains elevated metal concentrations including aluminum, copper, chromium, lead, and manganese, and has been classified as Group B mining waste pursuant to CCR T27. Cement kiln dust impacted the groundwater downgradient from CKD piles. Constituents of concern (COCs) include but are not limited to high pH, total dissolved solids, and high chemical oxygen demand and dissolved metals listed above. Closure of CKD-1 in 1998 with a low permeability cover and leachate removal and collection system (LCRS) served as corrective action and in time resulted in a significant decrease of concentrations of COCs in groundwater monitoring wells downgradient from the unit. CKD from CKD-2 was consolidated to CKD-1 prior to CKD-1 closure; the area was restored and regraded to natural contours. The investigations of volume and extent of CKD in CKD-3 were completed in 2015. Lehigh Hanson prepared a preliminary CKD-3 closure plan which includes a low permeability cover and leachate collection and removal system.

Quarry Pit has filled with groundwater and runoff/precipitation after the mining activities ceased and has been used for disposal for Group B leachate from CKD-1. This order discontinues the discharge of leachate from closed CKD units into the Quarry Pit and requires that Lehigh Hanson finds an alternate method for leachate disposal.

Calaveras Materials Inc. is mining waste rock classified as Group C mining waste and crushing it into a saleable aggregate. This facility also recycles some haul-back cement.

NJV

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

STANDARD PROVISIONS AND REPORTING REQUIREMENTS  
FOR  
WASTE DISCHARGE REQUIREMENTS  
FOR  
INDUSTRIAL FACILITIES REGULATED BY TITLE 27  
(Title 27, § 20005 et seq.)

April 2016

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## A. APPLICABILITY

1. These Standard Provisions and Reporting Requirements (SPRRs) are applicable to Class II surface impoundments, waste piles, and land treatment units that are regulated by the Central Valley Regional Water Quality Control Board (hereafter, Central Valley Water Board) pursuant to the provisions of California Code of Regulations, title 27 ("Title 27"), section 20005 et seq.
2. "Order," as used throughout this document, means the Waste Discharge Requirements (WDRs) to which these SPRRs are incorporated.
3. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, and do not protect the Discharger from liabilities under federal, state, or local laws. This Order does not convey any property rights or exclusive privileges.
4. The provisions of this Order are severable. If any provision of this Order is held invalid, the remainder of this Order shall not be affected.
5. If there is any conflicting or contradictory language between the WDRs, the Monitoring and Reporting Program (MRP), or the SPRRs, then language in the WDRs shall govern over either the MRP or the SPRRs, and language in the MRP shall govern over the SPRRs.
6. If there is a site-specific need to change a requirement in these SPRRs for a particular facility, the altered requirement shall be placed in the appropriate section of the WDRs and will supersede the corresponding SPRRs requirement. These SPRRs are standard and cannot be changed as part of the permit writing process or in response to comments, but they will be periodically updated on an as-needed basis.
7. Unless otherwise stated, all terms are as defined in Water Code section 13050 and in Title 27, section 20164.

## B. TERMS AND CONDITIONS

1. Failure to comply with any waste discharge requirement, monitoring and reporting requirement, or Standard Provisions and Reporting Requirement, or other order or prohibition issued, reissued, or amended by the Central Valley Water Board or the State Water Board, or intentionally or negligently discharging waste, or causing or permitting waste to be deposited where it is discharged into the waters of the state and creates a condition of pollution or nuisance, is a violation of this Order and the Water Code, which can result in the imposition of civil monetary liability [Wat. Code, § 13350(a)]
2. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to [Wat. Code, § 13381]:

- a. Violation of any term or condition contained in this Order;
  - b. Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts;
  - c. A change in any condition that results in either a temporary or permanent need to reduce or eliminate the authorized discharge; or
  - d. A material change in the character, location, or volume of discharge.
3. Before initiating a new discharge or making a material change in the character, location, or volume of an existing discharge, the Discharger shall file a new report of waste discharge (ROWD), or other appropriate joint technical document (JTD), with the Central Valley Water Board [Wat. Code, § 13260(c) and § 13264(a)]. A material change includes, but is not limited to, the following:
    - a. An increase in area or depth to be used for solid waste disposal beyond that specified in waste discharge requirements;
    - b. A significant change in disposal method, location, or volume (e.g., change from land disposal to land treatment);
    - c. A change in the type of waste being accepted for disposal; or
    - d. A change to previously-approved liner systems or final cover systems that would eliminate components or reduce the engineering properties of components.
  4. Representatives of the Central Valley Water Board may inspect the facilities to ascertain compliance with the waste discharge requirements. The inspection shall be made with the consent of the owner or possessor of the facilities or, if the consent is refused, with a duly issued warrant. However, in the event of an emergency affecting the public health or safety, an inspection may be made without consent or the issuance of a warrant [Wat. Code, §13267(c)].
  5. The Central Valley Water Board will review this Order periodically and will revise these waste discharge requirements when necessary [Wat. Code, § 13263(e) and Title 27, § 21720(b)].
  6. Except for material determined to be confidential in accordance with California law and regulations, all reports prepared in accordance with terms of this Order shall be available for public inspection at the offices of the Central Valley Water Board [Wat. Code, § 13267(b)]. Data on waste discharges, water quality, geology, and hydrogeology shall not be considered confidential.
  7. A discharge of waste into the waters of the state is a privilege, not a right. No discharge of waste into waters of the state, whether or not the discharge is

made pursuant to waste discharge requirements, shall create a vested right to continue the discharge [Wat. Code, § 13263(g)].

8. Technical and monitoring reports specified in this Order are requested pursuant to the Water Code [§13267(b)]. Failure to furnish the reports by the specified deadlines or falsifying information in the reports, are misdemeanors that may be liable civilly in accordance with §13268(b) of the Water Code [Wat. Code, §13268(a)].

## C. STANDARD PROHIBITIONS

1. The discharge of wastes which have the potential to reduce or impair the integrity of containment structures or which, if commingled with other wastes in the waste management unit, could produce violent reaction, heat or pressure, fire or explosion, toxic by-products, or reaction products, which, in turn:
  - a. require a higher level of containment than provided by the unit; or
  - b. are 'restricted wastes'; or
  - c. impair the integrity of containment structures;is prohibited [Title 27, § 20200(b)].
2. The discharge of wastes outside of a waste management unit or portions of a unit specifically designed for their containment is prohibited.
3. The discharge of waste to a closed waste management unit is prohibited.
4. The discharge of waste constituents to the unsaturated zone or to groundwater is prohibited, except within the treatment zone at a land treatment unit.
5. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.

## D. STANDARD DISCHARGE SPECIFICATIONS

1. The Discharger is responsible for accurate characterization of wastes, including a determination of whether or not wastes will be compatible with containment features and other wastes at the waste management unit and whether or not the wastes are required to be managed as a hazardous waste [Title 27, § 20200(c)] or designated waste [Title 27, § 20210].
2. Leachate collected from a waste management unit shall be discharged to the unit from which it came, or discharged to an appropriate waste management unit in accordance with Title 27 and in a manner consistent with the waste classification of the liquid [Title 27, § 20200(d) and § 20340(g)].

3. Wastes shall be discharged only into waste management units specifically designed for their containment and/or treatment, as described in this Order.
4. The discharge shall remain within the designated disposal area at all times.
5. The discharge of waste shall not cause a nuisance condition [Wat. Code, § 13050(m)].

## E. STANDARD FACILITY SPECIFICATIONS

1. All waste management units shall be designed, constructed, and operated to ensure that wastes, including leachate, will be a minimum of 5 feet above the highest anticipated elevation of underlying groundwater [Title 27, § 20240(c)], including the capillary fringe.
2. Surface and subsurface drainage from outside of a waste management unit shall be diverted from the unit [Title 27, § 20365(e)].
3. The Discharger shall **immediately** notify the Central Valley Water Board staff of any slope failure occurring at a waste management unit. Any failure which threatens the integrity of containment features or the waste management unit shall be promptly corrected in accordance with an approved method [Title 27, § 21710(c)(2)].
4. The Discharger shall **immediately** notify Central Valley Water Board staff of any flooding, unpermitted discharge of waste off-site or outside of waste management units, equipment failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.
5. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.
6. The Discharger shall lock all groundwater monitoring wells with a lock on the well cap or monitoring well box. All monitoring devices shall be clearly labeled with their designation including all monitoring wells, LCRS risers, and lysimeter risers and shall be easily accessible for required monitoring by authorized personnel. Each monitoring device shall be clearly visible and be protected from damage by equipment or vehicles.
7. The Discharger shall maintain the depth of the fluid in the sump of each waste management unit at the minimum needed for efficient pump operation (the depth at which the pump turns on given the pump intake height and maximum pump cycle frequency).

8. Each LCRS shall be tested at least annually to demonstrate proper operation. The results of the tests shall be compared with earlier tests made under comparable conditions [Title 27, § 20340(d)].
9. The Discharger shall maintain a *Storm Water Pollution Prevention Plan and Monitoring Program and Reporting Requirements* in accordance with State Water Board Order No. 2014-0057-DWQ (or most recent general industrial storm water permit), or retain all storm water on-site.

## F. STANDARD CONSTRUCTION SPECIFICATIONS

1. The Discharger shall submit for review and approval at least **90 days** prior to proposed construction, design plans and specifications for new Class II waste management units that include the following:
  - a. Detailed construction drawings showing all required liner system components, the LCRS, leachate sump, unsaturated zone monitoring system, and access to the LCRS for required annual testing.
  - b. A Construction Quality Assurance (CQA) Plan prepared by a California-registered civil engineer or certified engineering geologist, and that meets the requirements of Title 27, section 20324.
  - c. A geotechnical evaluation of the area soils, evaluating their use as the base layer or reference to the location of this information in the ROWD/JTD [Title 27, § 21750(f)(4)].
  - d. Information about the seismic design of the proposed new waste management unit (or reference to the location of this information in the ROWD/JTD) in accordance with Title 27, section 20370.
  - e. A revised water quality monitoring plan for groundwater detection monitoring (or information showing the existing plan is adequate) in accordance with Title 27, section 20415.
  - f. An Operation Plan (or reference to the location of this information in the ROWD/JTD) meeting the requirements of Title 27, sections 21760(b) and 20375(b).
2. All containment structures shall be designed by, and construction shall be supervised by, a California registered civil engineer or a certified engineering geologist, and shall be certified by that individual as meeting the prescriptive standards, or approved engineered alternative design, in accordance with this Order prior to waste discharge.
3. The Discharger shall not proceed with construction until the construction plans, specifications, and all applicable construction quality assurance plans have

been approved. Waste management units shall receive a final inspection and approval of the construction by Central Valley Water Board staff before use of the unit commences [Title 27, § 20310(e)].

4. Any report, or any amendment or revision of a report, that proposes a design or design change that might affect a waste management unit's containment features or monitoring systems shall be approved by a California registered civil engineer or a certified engineering geologist [Title 27, § 21710(d)].
5. Materials used in containment structures shall have appropriate chemical and physical properties to ensure that such structures do not fail to contain waste because of pressure gradients, physical contact with waste or leachate, chemical reactions with soil or rock, climatic conditions, the stress of installation, or because of the stress of daily operations [Title 27, § 20320(a)].
6. Waste management units and their respective containment structures shall be designed and constructed to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping [Title 27, § 20365(a)].
7. The Discharger shall design storm water conveyance systems for Class II units for a 1,000-year, 24-hour storm event [Title 27, § 21750(e)(3)].
8. All Class II waste management units shall be designed to withstand maximum credible earthquake without damage to the foundation or to the structures that control leachate, or surface drainage, or erosion [Title 27, § 20370(a)].
9. The Discharger shall perform stability analyses that include components to demonstrate the integrity of the waste management unit foundation, final slopes, and containment systems under both static and dynamic conditions throughout the life of the unit [Title 27, § 21750(f)(5)].
10. New Class II Units, other than LTUs and expansions of existing Class II units, shall have a 200 foot setback from any known Holocene fault. [Title 27, § 20250(d)].
11. Liners shall be designed and constructed to contain the fluid, including waste, and leachate [Title 27, § 20330(a)].
12. Hydraulic conductivities shall be determined primarily by appropriate field test methods in accordance with accepted civil engineering practice. The results of laboratory tests with both water and leachate, and field tests with water, shall be compared to evaluate how the field permeabilities will be affected by leachate. It is acceptable for the Discharger to use appropriate compaction tests in conjunction with laboratory hydraulic conductivity tests to determine field permeabilities as long as a reasonable number of field hydraulic conductivity tests are also conducted [Title 27, § 20320(c)].

13. Hydraulic conductivities specified for containment structures other than the final cover shall be relative to the fluids (leachate) to be contained. Hydraulic conductivities for the final cover shall be relative to water [Title 27, § 20320(b)].
14. A test pad for each barrier layer and any final cover shall be constructed in a manner duplicating the field construction. Test pad construction methods, with the designated equipment, shall be used to determine if the specified density/moisture-content/hydraulic conductivity relationships determined in the laboratory can be achieved in the field with the compaction equipment to be used and at the specified lift thickness [Title 27, § 20324(g)(1)(A)].
15. The Discharger shall ensure proper preparation of the subgrade for any liner system that includes a GCL so as to provide a smooth surface that is free from rocks, sticks, or other debris that could damage or otherwise limit the performance of the GCL.
16. The Discharger shall propose an electronic leak location survey of the top liner for any new waste management unit in the construction quality assurance plan unless the Discharger demonstrates that a leak location survey is not needed.
17. Leachate collection and removal systems are required for Class II surface impoundments [Title 27, § 20340(a)].
18. The LCRS shall be designed, constructed, maintained, and operated to collect and remove twice the maximum anticipated daily volume of leachate from the waste management unit [Title 27, § 20340(b)].
19. Leachate collection and removal systems shall be designed and operated to function without clogging through the life of the waste management unit.
20. The leachate sump, leachate removal pump, and pump controls shall be designed and set to maintain a fluid depth no greater than the minimum needed for efficient pump operation [Title 27, § 20340(c)].
21. All construction of liner systems and final cover systems shall be performed in accordance with a Construction Quality Assurance Plan certified by a registered civil engineer or a certified engineering geologist [Title 27, § 20323].
22. The Construction Quality Assurance program shall be supervised by a registered civil engineer or a certified engineering geologist who shall be designated the CQA officer [Title 27, § 20324(b)(2)].
23. The Discharger shall ensure that a third party independent of both the Discharger and the construction contractor performs all of the construction quality assurance monitoring and testing during the construction of a liner system.

24. The Discharger shall notify Central Valley Water Board staff at least **14 days** prior to commencing field construction activities including construction of a new Class II waste management unit, construction of a final cover (for units closed as a landfill), or any other construction that requires Central Valley Water Board staff approval under this Order.
25. The Discharger shall submit for review and approval at least **60 days** prior to proposed discharge, final documentation required in Title 27 Section 20324(d)(1)(C) following the completion of construction of a new Class II waste management unit. The report shall be certified by a registered civil engineer or a certified engineering geologist and include a statement that the liner system was constructed in accordance with the approved design plans and specifications, the CQA Plan, the requirements of the WDRs, and that it meets the performance goals of Title 27. The report shall contain sufficient information and test results to verify that construction was in accordance with the design plans and specifications, the construction quality assurance plan, and the performance goals of Title 27.
26. The Discharger shall not discharge waste onto a newly constructed liner system until the final documentation report has been reviewed and an acceptance letter has been received.

## G. STANDARD CLOSURE AND POST-CLOSURE SPECIFICATIONS

1. The final closure and post-closure maintenance plan for the waste management unit shall include at least the following: an itemized cost analysis, closure schedule, any proposed final treatment procedures, map, changes to the unit description presented in the most recent ROWD, future land use, and a construction quality assurance plan [Title 27, § 21769(c) & (d)].
2. Closure of each waste management unit shall be under the direct supervision of a registered civil engineer or certified engineering geologist [Title 27, § 20950(b)].
3. The final cover of waste management units closed as a landfill shall be designed, graded, and maintained to prevent ponding and soil erosion due to high run-off velocities [Title 27, § 21090(b)(1)(A)].
4. The final grading design shall be designed and approved by a registered civil engineer or certified engineering geologist [Title 27, § 21090(b)(1)(C)].
5. All final cover designs shall include a minimum 1-foot thick erosion resistant vegetative layer or a mechanically erosion-resistant layer [Title 27, § 21090(a)(3)(A)(1 & 2)].

6. Areas with slopes greater than ten percent, surface drainage courses, and areas subject to erosion by wind or water shall be designed and constructed to prevent such erosion [Title 27, § 21090(b)(2)].
7. The Discharger shall design storm water conveyance systems for Class II units that are closed as a landfill for a 1,000-year, 24-hour storm event [Title 27, § 21750(e)(3)].
8. Construction or repair of a final cover system's low-hydraulic conductivity layer is to be carried out in accordance with an approved construction quality assurance plan [Title 27, § 21090(b)(1)(E)].
9. Within **30 days** of completion of all closure activities, the Discharger shall certify that all closure activities were performed in accordance with the most recently approved final closure plan and CQA Plan, and in accordance with all applicable regulations. The Discharger shall also certify that units that are closed as a landfill shall be maintained in accordance with an approved post-closure maintenance plan [Title 27, § 21710(c)(6)].
10. The post-closure maintenance period for units closed as a landfill shall continue until the Central Valley Water Board determines that wastes remaining in the landfill unit(s) no longer pose a threat to water quality [Title 27, § 20950(a)(1)].
11. The Discharger shall periodically inspect and identify problems with the final cover including areas that require replanting, erosion, areas lacking free drainage, and any areas damaged by equipment operations [Title 27, § 21090(a)(4)(B)].
12. The Discharger shall repair any cover promptly in accordance with a cover repair plan to be included in the final post-closure maintenance plan [Title 27, § 21090(a)(4)(C)].

## H. STANDARD FINANCIAL ASSURANCE PROVISIONS

1. The Discharger shall establish an irrevocable fund (or provide other means) for closure to ensure closure of each Class II unit in accordance with an approved closure plan [Title 27, § 20950(f) and § 22207(a)].
2. The Discharger shall obtain and maintain assurances of financial responsibility for initiating and completing corrective action for all known and reasonably foreseeable releases from the waste management unit [Title 27, § 20380(b) and § 22222].

## I. STANDARD MONITORING SPECIFICATIONS

1. The water quality monitoring program shall include appropriate and consistent sampling and analytical procedures and methods designed to ensure that

monitoring results provide a reliable indication of water quality at all monitoring points and background monitoring points [Title 27, § 20415(e)(4)].

2. All monitoring systems shall be designed and certified by a registered geologist or a registered civil engineer [Title 27, § 20415(e)(1)].
3. All monitoring wells shall be cased and constructed in a manner that maintains the integrity of the monitoring well bore hole and prevents the bore hole from acting as a conduit for contaminant transport [Title 27, § 20415(b)(4)(A)].
4. All sample chemical analyses of any material shall be performed by a laboratory certified by the California Department of Health Services [Wat. Code, § 13176(a)].
5. A Detection Monitoring Program for a new Class II waste management unit shall be installed, operational, and one year of monitoring data collected from background monitoring points prior to the discharge of wastes [Title 27, § 20415(e)(6)].
6. Background for water samples shall be represented by the data from all samples taken from applicable background monitoring points during that reporting period (at least one sample from each background monitoring point).
7. The Discharger shall submit for approval, establish, and maintain an approved Sample Collection and Analysis Plan. The Sample Collection and Analysis Plan shall at a minimum include:
  - a. Sample collection procedures describing purging techniques, sampling equipment, and decontamination of sampling equipment;
  - b. Sample preservation information and shipment procedures;
  - c. Sample analytical methods and procedures;
  - d. Sample quality assurance/quality control (QA/QC) procedures;
  - e. Chain of Custody control; and
  - f. Sample analysis information including sample preparation techniques to avoid matrix interferences, method detection limits (MDLs), practical quantitation limits (PQLs) and reporting limits (RLs), and procedures for reporting trace results between the MDL and PQL.

If required by the Executive Officer, the Discharger shall modify the Sample Collection and Analysis Plan to conform with this Order.

8. For any given monitored medium, the samples taken from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be taken **within a span not to exceed 30 days**, unless a longer time period is approved, and shall be taken in a manner that ensures sample independence to the greatest extent feasible. Specific methods of collection and analysis must be identified. Sample collection, storage, and analysis shall be performed according to the most recent version of USEPA Methods, such as the latest editions, as applicable, of: (1) Methods for the Analysis of Organics in Water and Wastewater (USEPA 600 Series), (2) Test Methods for Evaluating Solid Waste (SW-846, latest edition), and (3) Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020), and in accordance with the approved Sample Collection and Analysis Plan. Appropriate sample preparation techniques shall be used to minimize matrix interferences.
9. If methods other than USEPA-approved methods or Standard Methods are used, or there is a proposed alternate USEPA method than the one listed in the MRP, the proposed methodology shall be submitted for review and approval prior to use, including information showing its equivalence to the required method.
10. The **methods of analysis and the detection limits** used must be appropriate for the expected concentrations. For the monitoring of any constituent or parameter that is found in concentrations which produce more than 90% non-numerical determinations (i.e., "trace" or "ND") in data from background monitoring points for that medium, the analytical method having the lowest MDL shall be selected from among those methods which would provide valid results in light of any matrix effects or interferences.
11. The laboratory reporting limit (RL) for all reported monitoring data shall be set no greater than the practical quantitation limit (PQL).
12. "**Trace**" results - results falling between the MDL and the PQL - shall be reported as such, and shall be accompanied both by the estimated MDL and PQL values for that analytical run.
13. Laboratory data shall not be altered or revised by the Discharger. If the Discharger observes potential lab errors, it shall identify the issue in the monitoring report and shall describe steps that will be taken to prevent similar errors in the future.
14. **MDLs and PQLs** shall be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the lab, rather than simply being quoted from USEPA analytical method manuals. In relatively

interference-free water, laboratory-derived MDLs and PQLs are expected to closely agree with published USEPA MDLs and PQLs. MDLs and PQLs shall be reported.

15. If the laboratory suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged in the laboratory report accordingly, along with estimates of the detection limit and quantitation limit actually achieved. The **MDL shall always be calculated such that it represents the lowest achievable concentration associated with a 99% reliability of a nonzero result**. The PQL shall always be calculated such that it represents the lowest constituent concentration at which a numerical value can be assigned with reasonable certainty that it represents the constituent's actual concentration in the sample. Normally, PQLs should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.
16. All **QA/QC data** shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and signature of a responsible person from the laboratory. **Sample results shall be reported unadjusted for blank results or spike recoveries**. In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged, but the analytical results shall not be adjusted.
17. Unknown chromatographic peaks shall be reported, flagged, and tracked for potential comparison to subsequent unknown peaks that may be observed in future sampling events. Identification of unknown chromatographic peaks that recur in subsequent sampling events may be required.
18. The sampling interval of each monitoring well shall be appropriately screened and fitted with an appropriate filter pack to enable collection of representative groundwater samples [Title 27, § 20415(b)(4)(B)].
19. All borings are to be logged during drilling under the direct supervision of a registered geologist or registered civil engineer with expertise in stratigraphic well logging [Title 27, § 20415(e)(2)].
20. Soils are to be described according to the Unified Soil Classification System [Title 27, § 20415(e)(2)(A)]. Rock is to be described in a manner appropriate for the purpose of the investigation [Title 27, § 20415(e)(2)(B)].

21. The Discharger shall submit a work plan for review and approval at least **60 days** prior to installation or abandonment of groundwater monitoring wells.
22. The Discharger shall provide Central Valley Water Board staff a minimum of **one week** notification prior to commencing any field activities related to the installation or abandonment of monitoring devices.
23. The water quality protection standard shall consist of the constituents of concern (COC), concentration limits, and the point of compliance. The water quality protection standard shall apply during the active life of the waste management unit, closure period, post-closure maintenance period, and any compliance period under Title 27, section 20410 [Title 27, § 20390].
24. The point of compliance at which the water quality protection standard applies is a vertical surface located at the hydraulically downgradient limit of the waste management unit that extends through the uppermost aquifer underlying the unit [Title 27, § 20405].
25. The compliance period is the minimum period of time during which the Discharger shall conduct a water quality monitoring program and is the number of years equal to the active life of the waste management unit plus the closure period [Title 27, § 20410(a)].
26. The groundwater monitoring system shall include a sufficient number of monitoring points, installed at appropriate locations, to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater that has not been affected by a release from the waste management unit [Title 27, § 20415(b)(1)(A)].
27. The Detection Monitoring Program shall include a sufficient number of monitoring points, installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the point of compliance to allow the detection of a release from the waste management unit [Title 27, § 20415(b)(1)(B)1.].
28. Additional monitoring points shall be added as necessary to provide the best assurance of the **earliest possible detection** of a release from the waste management unit [Title 27, § 20415(b)(1)(B)2.].
29. The Detection Monitoring Program shall also include a sufficient number of monitoring points installed at appropriate depths and locations to yield groundwater samples from other aquifers or perched zones not already monitored to provide the **earliest possible detection** of a release from the waste management unit [Title 27, § 20415(b)(1)(B)3. and 4., and §20420(b)].

30. A surface water monitoring system shall be established to monitor each surface water body that could be affected by a release from the waste management unit [Title 27, § 20415(c)].
31. An unsaturated zone monitoring system shall be established for each waste management unit [Title 27, § 20415(d)].
32. The Discharger shall notify Central Valley Water Board staff within **seven days** if fluid is detected in a previously dry LCRS, unsaturated zone monitoring system, or if a progressive increase is detected in the volume of fluid in a LCRS [Title 27, § 21710(c)(3)].
33. Driller's logs for all monitoring wells shall to be submitted to the Central Valley Water Board and the Department of Water Resources [Wat. Code, § 13751 and Title 27, § 20415(b)(3)].
34. Groundwater elevation, temperature, electrical conductivity, turbidity, and pH are to be accurately measured at each well each time groundwater is sampled [Title 27, § 20415(e)(13)].
35. The groundwater flow rate and direction in the uppermost aquifer and in any zones of perched water and in any additional portions of the zone of saturation being monitored shall be determined at least quarterly [Title 27, § 20415(e)(15)].
36. The Discharger shall graph all analytical data from each monitoring point and background monitoring point and shall submit the graphs to the Central Valley Water Board annually [Title 27, § 20415(e)(14)].
37. For each waste management unit, the Discharger shall collect all data necessary for selecting appropriate data analysis methods for establishing background values for each constituent of concern and for each monitoring parameter [Title 27, § 20420(c)]. The Discharger shall propose a data analysis method that includes a detailed description of the criteria to be used for determining "measurably significant" (as defined in Title 27, section 20164) evidence of a release from the waste management unit and determining compliance with the water quality protection standard [Title 27, § 20415(e)(6) and (7)].
38. For statistical analysis of data, the Discharger shall use one of the methods described in Title 27, section 20415(e)(8)(A)-(E). A non-statistical data analysis method can be used if the method can achieve the goal of the particular monitoring program at least as well as the most appropriate statistical method [Title 27, § 20415(e)(8)]. The Discharger shall use a statistical or nonstatistical data analysis method that complies with Title 27, section 20415(e)(7, 8, 9, and 10), to compare the concentration of each constituent of concern or monitoring parameter with its respective background concentration to determine whether

there has been a measurably significant evidence of a release from the waste management unit. For any given monitoring point at which a given constituent has already exhibited a measurably significant indication of a release at that monitoring point, the Discharger may propose to monitor the constituent, at that well, using a concentration-versus-time plot.

39. The Discharger may propose an alternate statistical method [to the methods listed under Title 27, section 20415(e)(8)(A-D)] in accordance with Title 27, section 20415(e)(8)(E), for review and approval.
40. The statistical method shall account for data below the practical quantitation limit (PQL) with one or more statistical procedures that are protective of human health and the environment. Any PQL validated pursuant to Title 27, section 20415(e)(7) that is used in the statistical method shall be **the lowest concentration (or value) that can be reliably achieved** within limits of precision and accuracy specified in the WDRs or an approved Sample Collection and Analysis Plan for routine laboratory operating conditions that are available to the facility. The Discharger's technical report (Sample Collection and Analysis Plan and/or Water Quality Protection Standard Report), pursuant to Title 27, section 20415(e)(7), shall consider the PQLs listed in Appendix IX, Article 19 to Chapter 14 of Division 4.5 of Title 22, CCR, for guidance when specifying limits of precision and accuracy. For any given constituent monitored at a background or downgradient monitoring point, an indication that falls between the MDL and the PQL for that constituent (hereinafter called a "trace" detection) shall be identified and used in appropriate statistical or non-statistical tests. Nevertheless, for a statistical method that is compatible with the proportion of censored data (trace and ND indications) in the data set, the Discharger can use the laboratory's concentration estimates in the trace range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of "ties".
41. The water quality protection standard for organic compounds which are not naturally occurring and not detected in background groundwater samples shall be taken as the detection limit of the analytical method used (e.g., USEPA methods 8260 and 8270).
42. Alternate statistical procedures may be used for determining the significance of analytical results for common laboratory contaminants (i.e., methylene chloride, acetone, diethylhexyl phthalate, and di-n-octyl phthalate) if part of an approved water quality protection standard. Nevertheless, analytical results involving detection of these analytes in any background or downgradient sample shall be reported and flagged for easy reference by Central Valley Water Board staff.
43. **Confirmation of Measurably Significant Evidence of a Release.** Whenever a constituent is detected at a detection monitoring point at a concentration that exceeds the concentration limit from the water quality protection standard, the

Discharger shall conduct verification sampling to confirm if the exceedance is due to a release or if it is a false-positive (unless previous monitoring has already confirmed a release for that constituent at that monitoring point). An exceedance of the concentration limit from the water quality protection standard is considered measurably significant evidence of a release that must be either confirmed or denied. There are two separate verification testing procedures:

- a. Standard Monitoring Specification I.44 provides the procedure for analytes that are detected in less than 10% of the background samples such as non-naturally occurring constituents like volatile organic compounds; and
- b. Standard Monitoring Specification I.45 provides the procedure for analytes that are detected in 10% or greater of the background samples such as naturally occurring constituents like chloride.

**44. Verification Procedure for Analytes Detected in Less than 10% of Background Samples.** The Discharger shall use the following non-statistical method for all analytes that are detected in less than 10% of the background samples. The non-statistical method shall be implemented as follows:

- a. **Initial Determination of Measurably Significant Evidence of a Release.** Identify each analyte in the **current** detection monitoring point sample that exceeds either its respective MDL or PQL, and for which a release has not been previously confirmed. The Discharger shall conclude that the exceedance provides a preliminary indication of a release or a change in the nature or extent of the release, at that monitoring point, if **either**:
  - 1) The data contains two or more analytes that equal or exceed their respective MDLs; or
  - 2) The data contains one or more analyte that equals or exceeds its PQL.
- b. **Discrete Retest** [Title 27, § 20415(e)(8)(E) and § 20420(j)(1-3)]:
  - 1) In the event that the Discharger or Central Valley Water Board staff concludes (pursuant to paragraph I.44.a., above) that there is a preliminary indication of a release, then the Discharger shall **immediately** notify Central Valley Water Board staff by phone or e-mail and, within **30 days** of such indication, shall collect two new (retest) samples from the monitoring point where the release is preliminarily indicated and analyze them for the constituents that caused the need for the retest.
  - 2) **Confirmation of a Release.** As soon as the retest data are available, the Discharger shall conclude that measurably significant evidence of a release is confirmed if (not including the original sample) two or more

analytes equal or exceed their respective MDLs or if one or more analyte equals or exceeds its PQL. The Discharger shall then:

- a) **Immediately** verbally notify the Central Valley Water Board whether or not the retest confirmed measurably significant evidence of a release for the analyte at the monitoring point, and follow up with written notification submitted by certified mail **within seven days** of the verbal notification; and
- b) Carry out the requirements of Section J, **RESPONSE TO A RELEASE** if a release has been confirmed.
- c) Add any five-year analyte that is confirmed per this method to the monitoring parameter list such that it is monitored during each regular monitoring event.

**45. Verification Procedure for Analytes Detected in 10% or Greater of the Background Samples.** The Discharger shall use either a statistical or non-statistical method pursuant to Title 27, section 20415(e)(8)(E) for all analytes that are detected in 10% or greater of the background samples. The Discharger shall use one of the statistical methods required in Title 27, section 20415(e)(8)(E) unless another method has been proposed by the Discharger in a Water Quality Protection Standard Report (or equivalent report) and approved by the Central Valley Water Board in a Monitoring and Reporting Program pursuant to Title 27, section 20415(e)(8)(A-D)] or section 20415(e)(8)(E). The method shall be implemented as follows:

- a. **Initial Determination of Measurably Significant Evidence of a Release.** The Discharger shall compare the value reported by the laboratory for each analyte to the statistically-derived concentration limit from the most recent report (Annual Monitoring Report or Water Quality Protection Standard Report) that uses the approved statistical procedure. If the value exceeds the concentration limit for that constituent, the Discharger shall conclude that there is measurably significant evidence of a release [Title 27, § 20420(i)].
- b. **Retest Method** [Title 27, § 20415(e)(8)(E) and § 20420(j)(1-3)].
  - 1) In the event that the Discharger or Central Valley Water Board staff concludes (pursuant to paragraph I.45.a., above) that there is a preliminary indication of a release, then the Discharger shall **immediately** notify Central Valley Water Board staff by phone or e-mail and, within **30 days** [Title 27, § 20415(e)(8)(E)(3)] of such indication, the Discharger shall implement a verification procedure/retest option, in accordance with Title 27, sections 20415(e)(8)(E) and 20420(j)(2). The verification procedure shall include either a single “composite” retest (i.e., a statistical analysis that augments and reanalyzes the data from the monitoring point that indicated a release) or shall consist of at least two “discrete” retests

(i.e., statistical analyses each of which analyzes only newly-acquired data from the monitoring point that indicated a release) [Title 27, § 20415(e)(8)(E)]. The Discharger may use an alternate method previously approved by the Central Valley Water Board and included in the Monitoring and Reporting Program. The verification procedure shall comply with the requirements of Title 27, section 20415(e)(8)(E) in addition to the performance standards of Title 27, section 20415(e)(9). The retest samples shall be collected from the monitoring point where the release is preliminarily indicated and shall be analyzed for the constituents that caused the need for the retest. For any indicated monitoring parameter or constituent of concern, if the retest results of one or more of the retest data suites confirm the original indication, the Discharger shall conclude that measurably significant evidence of a release has been confirmed.

- 2) **Confirmation of a Release.** As soon as the retest data are available, the Discharger shall evaluate the results pursuant to paragraph I.45.b.1, above and shall:
  - a) **Immediately** verbally notify the Central Valley Water Board whether or not the retest confirmed measurably significant evidence of a release for the analyte at the monitoring point, and follow up with written notification submitted by certified mail **within seven days** of the verbal notification; and
  - b) Carry out the requirements of Section J, **RESPONSE TO A RELEASE** if a release has been confirmed.
  - c) Add any five-year analyte that is confirmed per this method to the monitoring parameter list such that it is monitored during each regular monitoring event.

46. **Physical Evidence of a Release.** If the Discharger determines that there is a significant **physical** evidence of a release, the Discharger shall immediately verbally notify Central Valley Water Board staff and provide written notification **by certified mail within 7 days** of such determination, and within **90 days** shall submit an amended report of waste discharge to establish an Evaluation Monitoring Program [Title 27, § 20385(a)(3) and § 20420(l)(1) & (2)].

## J. RESPONSE TO A RELEASE

1. **Measurably Significant Evidence of a Release Has Been Confirmed.** If the Discharger has confirmed that there is measurably significant evidence of a release from a waste management unit pursuant to Standard Monitoring Specification I.44 or I.45, then the Discharger shall:
  - a. **Immediately** sample all monitoring points in the affected medium at that waste management unit and determine the concentration of all monitoring parameters and constituents of concern for comparison with established concentration limits. Because this constituent of concern scan does not involve statistical testing, the Discharger will need to collect and analyze only a single water sample from each monitoring point in the affected medium [Title 27, § 20420(k)(1)].
  - b. **Within 90 days** of confirming measurably significant evidence of a release, the Discharger shall submit an amended report of waste discharge to establish an Evaluation Monitoring Program meeting the requirements of Title 27, sections 20420(k)(5)(A-D), including but not limited to the results of sampling pursuant to paragraph J.1.a, above. The Evaluation Monitoring Program shall be designed for the collection and analysis of all data necessary to assess the nature and extent of the release and to determine the spatial distribution and concentration of each constituent throughout the zone affected by the release [Title 27, § 20420(k)(5) and § 20425(b)].
  - c. **Within 180 days** of confirming measurably significant evidence of a release, the Discharger shall submit to the Central Valley Water Board an initial engineering feasibility study for a Corrective Action Program necessary to meet the requirements of Title 27, section 20430. At a minimum, the initial engineering feasibility study shall contain a detailed description of the corrective action measures that could be taken to achieve background concentrations for all constituents of concern [Title 27, § 20420(k)(6)].
  - d. If the Discharger confirms that there is measurably significant evidence of a release from the waste management unit at any monitoring point, the Discharger may attempt to demonstrate that a source other than the waste management unit caused the evidence of a release or that the evidence is an artifact caused by an error in sampling, analysis, or statistical evaluation or by natural variation in groundwater, surface water, or the unsaturated zone. The Discharger may make a demonstration pursuant to Title 27, section 20420(k)(7) in addition to or in lieu of submitting both an amended report of waste discharge or an engineering feasibility study; however, the Discharger is not relieved of the requirements and due dates of Title 27, sections 20420(k)(6) & (7) unless Central Valley Water Board staff agree that the demonstration successfully shows that a source other than the

waste management unit caused the evidence of a release or that the evidence resulted from error in sampling, analysis, or statistical evaluation or from natural variation in groundwater, surface water, or the unsaturated zone. In order to make this demonstration, the Discharger shall notify the Central Valley Water Board by certified mail of the intent to make the demonstration **within seven days** of determining measurably significant evidence of a release, and shall submit a report **within 90 days** of determining measurably significant evidence of a release [Title 27, § 20420(k)(7)].

- e. **Within 90 days** of the date that the Evaluation Monitoring Program from paragraph J.1.b is approved (the date is it established), the Discharger shall complete and submit the following:
  - i) **Results and Assessment for the Evaluation Monitoring Program.** A report with the results and assessment based on the approved Evaluation Monitoring Program [Title 27, § 20425(b)].
  - ii) **Updated Engineering Feasibility Study.** An updated engineering feasibility study for corrective action based on the data collected to delineate the release and data from the ongoing monitoring program required under Title 27, section 20425(e) [Title 27, § 20425(c)].
  - iii) **Amended ROWD for a Corrective Action Program.** An amended report of waste discharge to establish a Corrective Action Program meeting the requirements of Title 27, section 20430 based on the data collected to delineate the release and based on the updated engineering feasibility study [Title 27, § 20425(d)].

## K. GENERAL PROVISIONS

1. In the event the Discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the Discharger shall notify the appropriate Central Valley Water Board office by telephone **as soon as** it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing **within two weeks**. The written notification shall state the nature, time, and cause of noncompliance, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.
2. All reports and transmittal letters shall be signed by persons identified below:
  - a. For a corporation: by a principal executive officer of at least the level of senior vice-president.
  - b. For a partnership or sole proprietorship: by a general partner or the proprietor.

- c. For a municipality, state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.
- d. A duly authorized representative of a person designated in a, b or c above if:
  - 1) The authorization is made in writing by a person described in a, b, or c of this provision;
  - 2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a Unit, superintendent, or position of equivalent responsibility (a duly authorized representative may thus be either a named individual or any individual occupying a named position); and
  - 3) The written authorization is submitted to the Central Valley Water Board.
- e. Any person signing a document under this Section shall make the following certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

- 3. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the State resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature, extent, and impact of the noncompliance.
- 4. The owner of the waste management facility shall have the continuing responsibility to assure protection of waters of the state from discharged wastes and leachate generated by discharged waste during the active life, closure, and any post-closure maintenance period of the waste management units and during subsequent use of the property for other purposes.
- 5. The fact that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this Order shall not be regarded as a defense for the Discharger's violations of this Order.
- 6. The Discharger shall notify the Central Valley Water Board of a material change in; the types, quantity, or concentrations of wastes discharged; site operations and features; or proposed closure procedures, including changes in cost

estimates. This notification shall be given a reasonable time before the changes are made or become effective. No changes shall be made without Central Valley Water Board approval following authorization for closure pursuant to the site Notification of Closure [Title 27, § 21710(a)(4)].

7. The Discharger shall maintain legible records of the volume and type of each waste discharged at each waste management unit or portion of a unit, and the manner and location of discharge. Such records shall be maintained by the Discharger until the beginning of the post-closure maintenance period. These records shall be on forms approved by the State Water Board or Central Valley Water Board and shall be maintained at the waste management facility until the beginning of the post-closure maintenance period. These records shall be available for review by representatives of the State Water Board or Central Valley Water Board at any time during normal business hours. At the beginning of the post-closure maintenance period, copies of these records shall be sent to the Central Valley Water Board [Title 27, § 21720(f)].
8. In the event of any change in landowner or the operator of the waste management facility, the Discharger shall notify the succeeding owner or operator in writing of the existence of this Order. A copy of that notification shall be sent to the Central Valley Water Board.
9. In the event of any change of ownership or responsibility for construction, operation, closure, or post-closure maintenance of the waste discharge facilities described in this Order, the Discharger shall notify the Central Valley Water Board prior to the effective date of the change and shall include a statement by the new Discharger that construction, operation, closure, or post-closure maintenance will be in compliance with this Order and any revisions thereof [Title 27, § 21710(c)(1)].
10. To assume ownership or operation under this Order, the succeeding owner or operator must apply in writing to the Central Valley Water Board requesting transfer of the Order within **14 days** of assuming ownership or operation of this facility. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory requirements contained in General Provision K.2 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the Water Code. Transfer of this Order shall be approved or disapproved by the Central Valley Water Board.

## L. STORM WATER PROVISIONS

1. The Discharger shall design storm water conveyance systems for Class II units for a 1,000-year, 24-hour storm event [Title 27, § 21750(e)(3)].

2. Waste management units and their respective containment structures shall be designed and constructed to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping under the precipitation conditions for the unit [Title 27, § 20365(a)].
3. Precipitation on Class II waste piles which is not diverted by covers or drainage control systems shall be collected and managed through the LCRS, which shall be designed and constructed to accommodate the precipitation conditions for each class unit [Title 27, § 20365(b)].
4. Diversion and drainage facilities shall be designed, constructed, and maintained to [Title 27, § 20365(c)]:
  - a. Accommodate the anticipated volume of precipitation and peak flows from surface runoff and under the precipitation conditions for the waste management unit.
  - b. Effectively divert sheet flow runoff laterally, via the shortest distance, into the drainage and collection facilities.
  - c. Prevent surface erosion through the use of energy dissipators where required to decrease the velocity of runoff, slope protection, and other erosion control measures where needed to prevent erosion.
  - d. Control and intercept run-on, in order to isolate uncontaminated surface waters from water that might have come into contact with waste.
  - e. Take into account:
    - i) For closed waste management units and for closed portions of units, the expected final contours of the closed unit, including its planned drainage pattern.
    - ii) For operating portions of waste management units other than surface impoundments, the unit's drainage pattern at any given time.
    - iii) The possible effects of the waste management unit's drainage pattern on and by the regional watershed.
    - iv) The design capacity of drainage systems of downstream and adjacent properties by providing for the gradual release of retained water downstream in a manner which does not exceed the expected peak flow rate at the point of discharge if there were no waste management facility.
  - f. Preserve the system's function. The Discharger shall periodically remove accumulated sediment from the sedimentation or detention basins as needed to preserve the design capacity of the system.

5. Collection and holding facilities associated with precipitation and drainage control systems shall be emptied immediately following each storm or otherwise managed to maintain the design capacity of the system [Title 27, § 20365(d)].
6. Surface and subsurface drainage from outside of a waste management unit shall be diverted from the unit [Title 27, § 20365(e)].
7. Cover materials shall be graded to divert precipitation from the waste management unit, to prevent ponding of surface water over wastes, and to resist erosion as a result of precipitation [Title 27, § 20365(f)].
8. Any drainage layer in a final cover shall be designed and constructed to intersect with the final drainage system for the waste management unit in a manner promoting free drainage from all portions of the drainage layer [Title 27, § 20365(f)].