

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2019-0056

WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF ROSEVILLE
ROSEVILLE LANDFILL
CLASS III LANDFILLS
POST-CLOSURE MAINTENANCE AND CORRECTIVE ACTION
PLACER COUNTY

FINDINGS

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

1. The City of Roseville owns and operates the Roseville Landfill (Facility) located in the City of Roseville (about one-mile northeast of the city center) in Placer County, Section 36, T11N, R6E Mount Diablo Base and Meridian (MDB&M). The Facility's location is shown in Attachment A: Location Map.
2. The City of Roseville (Discharger), as owner and operator of the Facility, is responsible for compliance with this Order.
3. This Order encompasses the postclosure maintenance and corrective action of the following waste management units (WMUs or units) at the Facility:

Table 1. Facility Waste Management Units

WMU ¹	Title 27 Unit Class	Subtitle D Unit Class	Unit Acreage	Status	Primary Wastes
Frmr. WMU A	Unclassified	n/a ²	2	Clean-closed	None
WMU B	Class III ³	n/a ²	4	Closed	MSW, C&D & Commercial
WMU C	Class III ³	n/a ²	7	Closed	MSW, C&D & Commercial
WMU D	Class III ³	n/a ²	9	Closed	MSW, C&D & Commercial

1. All landfills unlined with no leachate collection and recovery system (LCRS).
2. n/a – not applicable.
3. Class III designation based on installation of Title 27-compliant final cover as primary containment system. See Finding 41.

WMUs C and D, closed contiguously under previous WDRS, are regulated as a single unit under these WDRs and referred to as WMU C/D. See Finding 44.

4. The following documents are attached to this Order and hereby incorporated into and made a part of this Order by reference:
 - a. Attachment A – Location Map
 - b. Attachment B – Site Map
 - c. Attachment C – Gas Controls Map
 - d. Attachment D – Nearby Supply Wells
 - e. Attachment E – Groundwater Monitoring Summary
 - f. Information Sheet
 - g. Standard Provisions and Reporting Requirements, December 2015 Edition (SPRRs)
5. Also attached and incorporated as part of this Order is the separately-issued Monitoring and Reporting Program R5-2019-0056 (MRP), which sets forth the approved Water Quality Protection Standard (WQPS) for the waste management units (WMUs) at the Facility. (See Title 27, § 20390 et seq.). Compliance with the operative MRP (including subsequent amendments) is required under this Order.
6. A Report of Waste Discharge (RWD) was not required or submitted for preparation of this Order because the information needed to update the WDRs is already available on file.
7. On-site facilities at the Roseville Landfill include the landfill units, landfill access roads, precipitation and drainage controls (e.g., perimeter ditches), erosion controls (e.g., rip rap), a passive landfill gas extraction system (wind-driven turbine vents), gas monitoring facilities, and groundwater monitoring wells.

Wastes / Unit Classifications

8. The Facility is not subject to federal municipal solid waste landfill regulations (Title 40, Code of Federal Regulations, Part 258, or “Subtitle D”) because it ceased accepting wastes before the effective date of those regulations, 9 October 1991.
9. On 9 July 2004, the Central Valley Water Board adopted WDR Order R5-2004-0104, which classified unlined WMUs B, C and D as Class III units for the discharge of waste.¹ This Order continues these classifications, as set forth

1. Prior to 1994, all landfill units at the Facility were existing “closed, abandoned, or inactive” (CAI) units under former Ch.15 regulations because they stopped accepting wastes prior to 27 Nov. 1984. In 1994, the units were reclassified as Class III landfill units under previous Order 94-015 per Title 27, section 20080(d).

above in Finding 3, based on the installation of a Title 27-compliant final cover of the units in 1995, as described in Findings 41 through 43. Former WMU A was a “closed, abandoned, or inactive” (CAI) unit under Chapter 15/Title 27 regulations prior to completion of clean closure of the unit in 1994. See Finding 10.

10. WMUs A through D operated from 1967 through 1979, accepting MSW/household, construction, and commercial wastes defined as “nonhazardous” and “inert” per Title 27 sections 20220(a) and 20230(a). WMU A was used primarily for the disposal of street sweeping wastes and leaves, while WMU B was used primarily for the disposal of green waste and construction debris (e.g., wood). WMUs C and D were used primarily for the disposal of MSW and commercial wastes.

Site Description

11. The 115-acre site is located at 998 Berry Street east of Galleria Boulevard in the City of Roseville about one-mile northeast of the city center. The Assessor’s Parcel Number (APN) of the site is APN 015-011-022. The geographic coordinates of the site are Latitude 38.527°north, Longitude -121.470° west. See Attachment A.
12. The site is in the Antelope Creek Valley in the eastern portion of the Sacramento Valley alluvial plain about six miles west and southwest of the Sierra Nevada foothills. Topographic relief in the WMU consists of low rolling terrain with rounded knolls and ridges separated by intermittent streams. Elevations range from about 150 to 180 feet MSL, sloping to the southwest.
13. Land uses in the WMU include transportation corridors, commercial, residential, recreational, and industrial. The transportation corridors include Harding/Galleria Boulevard, Berry Street, the Roseville Parkway overpass, Union Pacific Railroad tracks, and the Interstate 80 freeway. Commercial uses include restaurants, shopping, gasoline service stations, and a family entertainment center. The closest residential uses are apartment complexes immediately north and about one-quarter mile northeast of the site. Recreational uses include an adjacent archery club and a bike trail. Industrial uses include two PG&E-owned electrical power substations immediately north of the site, a drop-box transfer station, and the closed Berry Street Mall (aka Fingers) Landfill. See Attachment B: Site Map.
14. Also, immediately north of the site is an old household waste burn dump (11 acres) formerly operated by the City of Roseville in the 1940s. A small (1.2-acre) portion of the former burn dump is on City-owned land and the remainder of the burn dump is on land owned by PG&E. The burn dump pre-dates Chapter 15/Title 27 regulations and is not regulated under these WDRs, but the portion on City-owned land was graded and covered with vegetative cover in 1994 under the Final Closure Plan for the Roseville Landfill. Given its physical separation from the Roseville Landfill site and other factors (age, divided ownership, and nature of

- historical operations), the burn dump (including the portion regulated under previous WDRs) is not regulated under this Order. See Finding 49, Attachment B: Site Map, and Information Sheet.
15. Portions of the landfill side slopes lie within the 100-year floodplain and have been fortified with riprap to protect against washout per Title 27, Section 20260(c). (The units pre-date the more stringent flood plain protection requirements of Subtitle D regulations.) See Findings 46, 54, and 55.
 16. The 100-year, 24-hour precipitation event for the site is about 4.3 inches based on the *Rainfall Depth Duration Frequency Data* provided on the Department of Water Resources' (DWR) Flood Emergency Response Information Exchange (FERIX) website for the Avion Station (A00 6105 50) approximately five miles southwest of the site. The facility receives an average of 23.1 inches of precipitation per year as measured at this station. The mean pan evaporation rate is about 50 inches per year (6.3 inches per month during the dry season and 2.0 inches per month during the wet season).² Average monthly evaporation typically exceeds average monthly precipitation eight months of the year (i.e., from March through October).³
 17. A March 2019 Department of Water Resources (DWR) well survey identified at least five groundwater supply wells within a one-mile radius of the site, including three domestic supply wells, one agricultural/irrigation well, and two that appear to be industrial supply wells. The locations of these wells relative to the Facility are shown on Attachment D: Nearby Supply Wells.
 18. The topography of the Antelope Creek Valley reflects the transition between Sacramento Valley alluvial deposits and the exposed bedrock of the Sierra Foothills. The WMU is underlain by Holocene alluvium and Pleistocene-age Turlock Lake and Riverbank formation deposits, including unconsolidated sands, gravels, silts, and clays. Bedrock consists of Tertiary Mehrten and underlying Valley Springs volcanoclastic sediments. The Mehrten is also exposed in the uplands that bound the Antelope Creek Valley.
 19. WMUs B, C and D are underlain by about 40 feet of alluvial deposits of the Riverbank Formation consisting of unconsolidated sand, gravel, and silt with minor clay. Former WMU A and the offsite burn dump are underlain by the Mehrten Formation which consists of interbedded tuff breccia and andesitic sand. The Mehrten Formation has a maximum thickness of 200 feet at the site.
 20. There are no known Holocene faults in the landfill WMU. The nearest historically active fault to the site is the Foothills Fault System about 14 miles northeast of the site. In 1975, an earthquake registering 5.8 on the Richter scale occurred along

2. Estimate based on historical data collected at DWR's Fair Oaks California Irrigation Management Information System (CIMIS) Station about eight miles south of the site

3. Estimate based on rainfall data from the Sacramento Station (A00 7633 00).

the Cleveland Hills Fault (Foothills Fault System) near Oroville. This is the maximum probable earthquake (MPE) for this site.

Unsaturated Zone

21. Prior to implementing passive LFG controls as a corrective action measure (see Finding 48), methane concentrations up to 55 percent by volume were historically detected in landfill gas (LFG) probes along the south and southeastern perimeters of WMU C/D.
22. There are nine LFG monitoring locations (LFGs-1, 3, 4, 5, and 7 through 11) along the perimeter of the landfill, including six dual probe wells (LFGs-1, 3, and 8 through 11) and three single probe wells (LFGs-4, 5 and 7). The dual completion gas monitoring wells are screened in upper, and lower sections of the unsaturated zone opposite landfill waste and the single completion wells over the entire interval. The concentration of methane has generally been non-detect to trace in all probes during the past 10 years with the single exception of 1.1 percent methane detected in the shallow zone at probe LFG-10 in March 2016. No gas VOC analysis was conducted or required during this period.

Surface Water and Groundwater Conditions

23. The operative Water Quality Control Plan for Sacramento and San Joaquin River Basins (Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.
24. Surface drainage is to Antelope Creek, which meanders from northeast to southwest through the site, flowing along the west side of WMU C/D, between WMU C/D and B, and then along the east side of WMU B. Downstream of the site it joins Dry Creek, tributary to the Natomas East Main Drain, and the Sacramento River.
25. The uppermost aquifer occurs in Riverbank Formation on the southeast (upgradient) side of the site and in Valley Springs bedrock on the northwest (down gradient) side of the site. Groundwater elevation monitoring data indicates that both WMUs are likely in hydraulic communication.
26. The depth to groundwater ranges from about seven to 125 feet site-wide. Shallow groundwater generally flows to the west-northwest with seasonal gradients ranging from about 0.040 ft/ft in the wet season to 0.036 ft/ft in the dry season. Groundwater elevations range from about 172 feet above Mean Sea Level (MSL) along the eastern side of the landfill to about 90 feet MSL along the northeast site perimeter. Historical groundwater elevation data indicates minimal seasonal variation (i.e. less than two feet).

Groundwater Monitoring

27. There are currently 14 monitoring wells at the site (MWs-1, 2, 3, 5, 8, 9, 10A, 10B, and 11 through 16), including two wells down gradient of WMU B (MWs-12 and 15) and five wells down gradient of WMU C/D (MWs-5, 8, 13, 14 and 16). The remaining wells are either upgradient or side gradient of the units. There are also two offsite wells (MWs-6 and 7a) historically used to monitor the burn dump area northwest of the site. Continued monitoring of these wells under these WDRs is considered voluntary. See MRP Section A.1.
28. Groundwater detection monitoring at the site for general minerals and other inorganic constituents that can be evaluated statistically (e.g., dissolved metals naturally occurring in background) is conducted using an interwell approach (i.e., by comparing of downgradient sample results with concentration limits derived from statistical evaluation of historical upgradient data) in accordance with Title 27 regulations, while groundwater detection monitoring for organic constituents not natural present in background (e.g., VOCs) is generally conducted using a non-statistical, intrawell approach (i.e., by comparing of sample results from a given monitoring well with the method detect limit for that inorganic constituent). See MRP, Section C.4.
29. Title 27 specifies the prescriptive requirements and performance standards applicable to monitoring data analysis and requires that such methods be implemented as follows:
 - a. As specified in the existing MRP under the WDRs; or
 - b. In accordance with a technical report (certified by an appropriately registered professional) documenting such methods, submitted to, and approved by, the Central Valley Water Board; or
 - c. In accordance with any water quality data analysis software deemed appropriate for such use by either the Central Valley Water Board or SWRCB.

See Title 27, section 20415, subparagraphs (e)(7) and (e)(10).
30. The groundwater data analysis methods used in monitoring were described in the 2018 Annual Monitoring Report submitted under previous WDRs.^{4,5} These WDRs require that the Discharger submit an updated monitoring data analysis report addressing any changes in monitoring data methods at the site, including any necessary changes to comply with the prescriptive requirement for separate

4. See Appendix G, January 2019 *2018 Annual Water Quality Monitoring Report*, prepared by Jacobs.

5. Groundwater sampling procedures and protocols at the site are conducted in accordance with a November 2016 *Sampling and Analysis Plan for Roseville Landfill*, prepared by CH2M.

monitoring of the units at the site absent an approved alternative. See Monitoring Specifications G.5 and G.6, and Time Schedule B.a.

31. Title 27, section 20390 requires that the Central Valley Water Board establish a Water Quality Protection Standard (WQPS) in the WDRs for each unit, including Constituents of Concern (COCs), Concentration Limits, Point of Compliance, and Monitoring Points. A WQPS report for the site was last submitted in July 2016. These WDRs require that the Discharger submit an updated WQPS report to reflect changes at the site since July 2016 and requirements of these WDRs, including MRP No. R5-2019-0056. For example, the WQPS needs to be modified to reflect Title 27 requirements for separate monitoring of the landfill units at the site absent an approved demonstration of a shared monitoring system for the units. The WQPS also needs to address whether monitoring wells need to be grouped according to the minerology of the zone in which they are screened (e.g., Riverbank or Mehrten formations) for interwell monitoring purposes and provide a justification for pooling of background data. See Finding 27, Monitoring Specification G.7, and Time Schedule I.B

Groundwater Impacts and Corrective Action

32. A 1988 Solid Waste Assessment Test (SWAT) investigation found volatile organic compounds (VOCs) and elevated concentrations of inorganic constituents, including general minerals and certain dissolved metals, in the groundwater at the site. Subsequent evaluation monitoring showed chloroethane up to 110 µg/L, chloroform up to 17 µg/L, dichlorodifluoromethane up to 92 µg/L, tetrachloroethylene up to 24 µg/L, trichloroethylene up to 10 µg/L, trichlorofluoromethane up to 24 µg/L, vinyl chloride up to 99 µg/L and other chlorinated VOCs.
33. In 1995, the Discharger implemented landfill closure and passive LFG controls as corrective action measures to address groundwater impacts and LFG exceedances at the site. The work was implemented under a 1994 approved preliminary engineering feasibility study and corrective action plan (EFS/CAP) submitted per Title 27, sections 20415 and 20425.⁶ Closure of the landfill units was also required as Class III landfills under Title 27 regulations. The closure and corrective action work are described in Findings 43 through 48.
34. Historical monitoring data for the landfill units collected since the year 2000 indicates that concentrations of most of the VOCs detected in groundwater have declined to non-detect levels. A summary table of the WMU C/D monitoring results is provided in Attachment E: Groundwater Monitoring Summary. Of the four VOCs that continued to be detected in 2018, only one, vinyl chloride (1.6

⁶. See 2 May 1994 *Preliminary Engineering Feasibility and Corrective Action Report, Roseville Sanitary Landfill*, prepared by CH2MHILL

µg/L), was detected above drinking water standards (0.5 µg/L California MCL) and in only one monitoring well, MW-12. Similar trends were noted in monitoring well MW-15 down gradient of WMU B, which the historical data indicates was less VOC-impacted than the WMU C/D monitoring wells. Only one VOC, acetone, continues to be detected (at trace levels) in MW-15.

The decline in the number and concentrations of VOCs detected in groundwater at both units is likely attributable to corrective action measures implemented at the site (i.e., closure and LFG venting) and natural attenuation processes.

35. Slightly elevated concentrations of general minerals, primarily total dissolved solids (TDS) and total alkalinity, have also historically been detected in groundwater monitoring wells immediately down gradient of the landfill units. The levels of pH in these wells also appeared to be slightly lower, indicating LFG may be affecting the groundwater geochemistry (e.g., dissolution of carbon dioxide into groundwater). Time series plots of the data indicate stable concentrations of the elevated general minerals at WMU B and declining concentrations of these constituents at WMUs C/D. See Attachment E - Tables I.B and II.A.
36. Spatial variability of certain inorganic constituents (e.g., arsenic, iron, and manganese) has also been historically detected in groundwater monitoring wells at the site. This spatial variability may be attributable to the effects of LFG on the groundwater geochemistry and/or spatial variability of the mineralogy itself.⁷ The presence of elevated dissolved manganese in monitoring wells proximate to the landfill, for example, may be attributable to the reducing effects of methane (e.g., Mn^{+4} reduced to Mn^{+2}). The secondary MCL for manganese is 0.05 mg/L. See Attachment E – Tables I.C and II.B.

Landfill Design and Construction

37. None of the landfill units at the site are lined nor were any constructed with a leachate collection and recovery system (LCRS).
38. WMU B was constructed on natural grade without any prior excavation and enclosed with earthen berms on the north, east and south sides. The berms were about 15 feet wide at the crest with exterior slopes of 2H:1V, except at the NE corner where the side slope was 1.5H:1V. The berms were subsequently mined out for foundation layer soil during closure construction in 1995. The minimum elevation of waste is about 155 feet MSL along the longitudinal axis of the unit. The construction of WMU A is not documented, but is assumed to have been similar to WMU B.
39. WMUs C and D were constructed by excavating to about 18 feet below natural

⁷. Most of these wells showing spatial variability were screen in the Mehrten Formation.

grade and using the excavated soil to construct berms for MSW disposal cells. The cells had generally the same dimensions as those constructed at WMU B and were oriented north-south in WMU C and east-west in WMU D. The minimum elevation of waste is about 155 feet MSL at the center of the cells.

40. The maximum depth of waste at WMUs B and C/D, including reconsolidated waste from WMU A and closure-related slope reconstruction activities, was about 33 feet and 42 feet, respectively.

Landfill Closure

41. A landfill's containment system includes its base liner, and, after closure, its final cover. Title 27, section 20950, subdivision (a)(2)(A).1 states, in part:

Closure — for landfills . . . and surface impoundments closed as landfills, the goal of closure, including but not limited to the installation of a final cover, is to minimize the infiltration of water into the waste, thereby minimizing the production of leachate and gas. For such Units, after closure, the final cover constitutes the Unit's principal waste containment feature....

42. The Title 27 prescriptive final cover design for a non-Subtitle D-lined MSW landfill includes the following components, from top to bottom:⁸
- a. Erosion Resistant Layer -- at least one foot of vegetative cover soil with established vegetative cover;
 - b. Low Hydraulic Conductivity (LHC) Layer -- Minimum one foot of compacted clay soil with a permeability not exceeding the lesser of 1×10^{-6} cm/s or the permeability of underlying clay soil liner or natural geologic materials, as applicable;
 - c. Foundation Layer - at least two feet of materials (soil and/or waste) with appropriate engineering properties to support the overlying cover.
43. Former WMU A, comprising two acres in the southwest corner of the site, was clean closed in 1994. Most of the waste in WMU A was consolidated into WMU B in the mid-1980s and the remaining wastes (e.g., leaves, street sweeping wastes, beverage containers identified in a 1994 test pit investigation) consolidated into WMU B's foundation layer as part of landfill closure activities conducted in 1994.⁹ See Findings 3 and 44.

8. For compositely lined MSW landfills (not applicable to the Roseville Landfill), a geomembrane barrier layer is also required in the final cover design to prevent a "bathtub effect",

9. See 27 January 1994 Technical Memorandum Area A Field Investigation, prepared by CH2MHILL.

44. In December 1995, the Discharger closed WMUs B and C/D with a Title 27 prescriptive clay soil cover in accordance with the 1994 EFS/CAP and an approved Final Closure Plan and Post-Closure Maintenance Plan (FCPMP).¹⁰ WMUs C and D were closed with a contiguous final cover, while WMU B was closed with a separate final cover. The final cover design and details of the closure work are provided in previous WDRs. The results of the landfill closure activities, including former WMUA, were documented in a February 1996 Closure Certification Report.¹¹
45. Both units were generally graded with 3H:1V side slopes and 5 percent minimum crest WMU slopes. Except for the west slope, which was graded to 6H:1V, WMU B was graded with a NE-SW oriented elongated crest to a maximum elevation of about 192 feet MSL. WMU C/D was also graded to a maximum elevation of about 205 feet MSL with the crest at the northern end of the unit.
46. Riprap was placed at three locations along the base of the landfill side slopes (i.e. northern slope of WMU B and eastern and northeastern side slopes of WMU C/D) to protect against erosion from high (i.e. 100-year) creek flows (see Attachment B).
47. Precipitation and drainage controls designed to convey site runoff from a 100-year 24-hour storm event were installed as part of landfill closure, including a concrete-lined ditch along the north and northeastern perimeter of WMU C/D, an unlined V-ditch along the southeastern perimeter of WMU C/D, and two unlined V-ditches along the western perimeter of WMU B. All perimeter ditches outfall to Antelope Creek at the locations shown in Attachment B. Runoff from the landfills enters these drains by sheet flow.
48. Passive LFG controls were also installed as a corrective action measure under the EFS/CAP. Nine passive LFG vents (VRs-1 through 9) were installed through the final cover along the center-line of the units, including two at WMU B (VR-1 and VR-2) and seven at WMU C/D (VRs-1 through 7). Six of the WMU C/D vents were installed on the northeast side of the parkway and one on the southwest side of the parkway.¹² Six LFG monitoring wells (LFG-1 through 6) with two probes in each well were also installed in perimeter WMUs around the landfills. Additional gas vents (VRs-9, 10, and 11) were installed in 2003 along the eastern perimeter drain of WMU C/D. No methane exceedances have been detected along the

10. See July 1994 *Final Closure Plan and Post-Closure Maintenance Plan* prepared by CH2MHILL.

11. See February 1996 *Construction Quality Assurance, Final Closure Report for the Roseville Sanitary Landfill*, prepared by Youngdahl & Associates.

12. The system included a collection system consisting of a network of 4-inch diameter perforated HDPE collection pipes placed in gravel-filled trenches (3 feet deep and 2 feet wide) in waste immediately below the final cover. One trench was installed along the length of the landfill crest and 6 shorter trenches were installed perpendicular to the landfill side slopes. Vents consisting of HDPE riser pipes housed in steel pipe were placed along the crest and connected to the trench system piping.

landfill perimeter since installation of these perimeter vents. See Attachment C: Gas Monitoring & Controls.

49. The portion of the burn dump owned by the Discharger, between Galleria Boulevard and the PG&E-owned portion, was closed with a non-Title 27 cover in accordance with the Final Closure Plan (FCP). The WMU was smoothed, compacted and graded for drainage to the street, and then covered with one foot of vegetative cover soil and seeded to establish vegetative cover.

Post-Closure

50. The Roseville Parkway was constructed through WMU C/D in 1999 and 2000. The details of this construction were provided in previous WDRs.
51. The most recent aerial topographic survey was completed on 8 November 2017. Compared with the 1995 postclosure survey, the 2017 survey indicated about one foot of settlement throughout the landfill since landfill closure, with localized settlement up to about 3 feet, along or near steeper slopes. Minor settlement in the vent WMUs is also typical. The Discharger fills in WMUs of differential settlement prior to each wet season in accordance with the post-closure maintenance plan. Increases in cover elevation up to one foot also sometimes occur as a result of repairs. Details as to postclosure cover repairs previously implemented at the site as a result of differential settlement and erosion, including perimeter drains, may be found in previous WDRs.
52. In 2007, the City constructed a public bike trail through the landfill WMU as shown in Attachment B. Post-closure Specification 8 of these WDRs requires that any proposed change in post-closure use at the landfill be in accordance with Section 21190 of Title 27.
53. The Sacramento Regional Transit District has previously indicated it would like to construct a Roseville Parkway Station and Park-N-Ride lot over the portion of WMU C/D south of the Roseville Parkway overpass, but as of 2018, has not proposed the project.
54. As noted in Finding 15, portions of the landfill units (i.e., lower slopes) adjacent to Antelope Creek are within the 100-year floodplain. In 2014, the Placer County Flood Control and Water Conservation District (PCFCD) proposed construction of two onsite weirs in Antelope Creek as part of the Antelope Creek Flood Control Project. The purpose of the project was to reduce peak stormwater surges in Antelope and Dry Creek downstream of the Site. One weir would be constructed immediately downstream of WMU B (lower weir), and the other between WMU-B and WMU-C/D (upper weir). The proposed weirs would be designed to control and pass normal creek flows without restriction, detain flood water in the creek channel during 50 to 100-year storm events, and allow any flows in excess of a

100-year levels to bypass the weirs and flow downstream. The impact of the project would be to increase the 100-year flood elevations by up to 3.64 feet in the affected WMUs of the site, including the lower slopes of WMU B and C/D.

Amended versions of the project work plan were subsequently submitted in response to Water Board Compliance and Enforcement Unit staff comments, which included the need for clean closure of portions of the WMUs that could be eroded or inundated by increased flood levels resulting from the project. Construction of the lower weir was also postponed.

55. In 2017, the PCFCD completed construction of the upper weir between WMUs B and C/D. The work included re-grading of adjacent slopes for storm water drainage and installation of armoring (rip rap and/or turf reinforcement matting) along the side slopes of the creek on both sides of the weir. The bike path elevation was also increased to prevent it from becoming inundated during peak floods. Because of the re-grading and increasing the elevation of the bike path, access to monitoring wells MW-5 and MW-8 was altered slightly. The soil between Antelope Creek, MW-9, and MW-10A/B was excavated down to the water table and used as backfill during the Project. A buffer of approximately five to 10 feet of undisturbed soil was left in place surrounding the wells. Because of the shallow groundwater in this WMU, if Antelope Creek floods, the excavated WMU between the wells will also flood. The construction activities affecting the Landfill were summarized in a 2018 certification report.¹³

Cost Estimates and Financial Assurances

56. The December 2016 updated FC/PCMP includes a 30-year total cost estimate of approximately \$3.7 million in 1994 dollars. No corrective action cost estimate for the site is provided. These WDRs require that the Discharger submit an updated FC/PCMP that includes updated cost estimates for postclosure maintenance and corrective action. See Postclosure Specification E.9.
57. The Discharger is not required to demonstrate financial assurances for post-closure maintenance to CalRecycle under Section 22210(b) of Title 27, because the landfill ceased operations prior to 1 January 1988. The Discharger is also not required to demonstrate financial assurances for water and non-water release corrective actions to CalRecycle under Section Title 27, section 22101 because the landfill ceased operations prior to 1 July 1991 and 1 July 2011, respectively.
58. The Discharger is required to provide financial assurances for post-closure maintenance and corrective action to the Regional Board, however, in accordance with Sections 22212 and 22222 of Title 27, respectively.

¹³. See May 2018 *Antelope Creek Flood Control Project – Summary Report*, prepared by Jacobs.

Other Regulatory Considerations

59. This Order implements the Central Valley Water Board's revised May 2018 *Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan)*, which designates beneficial uses for surface water and groundwater and establishes water quality objectives (WQOs) necessary to preserve such beneficial uses. (See Wat. Code, § 13241 et seq.)
60. According to the *Basin Plan*, designated beneficial uses of the nearest surface water (Antelope Creek) include: municipal and domestic supply (MUN); agricultural supply (AGR); industrial service supply (PRO); water contact recreation (REC-1); non-water contact recreation (REC-2); warm freshwater habitat (WARM); cold freshwater habitat (COLD); wildlife habitat (WILD); migration of aquatic organisms (MIGR); and spawning, reproduction and/or early development (SPAWN).¹⁴
61. According to the *Basin Plan*, designated beneficial uses of groundwater at the Facility include municipal and domestic supply (MUN); agricultural supply (AGR); industrial service supply (IND); and industrial process supply (PRO).
62. The City of Roseville approved a Negative Declaration (State Clearinghouse No. 95 022 048) and filed a Notice of Determination for the landfill closure project on March 22, 1995 in accordance with the California Environmental Quality Act (CEQA, Public Resources Code Section 21000 et seq.) and CEQA Guidelines (14 Cal. Code Regs., tit. 14, § 5000 et seq.). The document incorporated the Final Closure and Post-Closure Maintenance Plan for the landfill as approved by Regional Board staff.
63. The issuance of this Order, which prescribes waste discharge requirements and monitoring for an existing facility, is exempt from the procedural requirements of the California Environmental Quality Act (CEQA), Public Resources Code section 21000 et seq., pursuant to section 15301 of the CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq.).
64. The State Water Resources Control Board's *Statement of Policy with Respect to Maintaining High Quality Waters in California*, Resolution 68-16 (*Antidegradation Policy*) prohibits the Central Valley Water Board from authorizing degradation of "high quality waters" unless it is shown that such degradation: (1) will be consistent with the maximum benefit to the people of California; (2) will not unreasonably affect beneficial uses, or otherwise result in water quality less than

¹⁴. Beneficial uses determined by application of "tributary rule" to Sacramento River. Navigation (NAV) beneficial use of Sacramento River determined not to apply to Antelope Creek by application of this rule.

as prescribed in applicable policies; and (3) is minimized through the discharger's best practicable treatment or control.

65. Consistent with Title 27, this Order requires the Discharger to maintain the Facility to contain waste within WMUs, thereby preventing degradation of water quality. Accordingly, this Order complies with the *Antidegradation Policy*.
66. For the purposes of California Code of Regulations, title 23 (Title 23), section 2200, the Facility has a threat-complexity rating of **2-B**, where:
 - a. Threat Category "2" reflects waste discharges that can impair receiving water beneficial uses, cause short-term water quality objective violations, cause secondary drinking water standard violations, and cause nuisances; and
 - b. Complexity Category "B" reflects any discharger not included in Category A, with either (1) physical, chemical or biological treatment systems (except for septic systems with subsurface disposal), or (2) any Class II or Class III WMUs.
67. Water Code section 13263, subdivision (b)(1) provides that:

[T]he 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 ... 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 report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation about the need for the reports and shall identify the evidence that supports requiring that person to provide the reports.
68. The technical reports required under this Order, as well as those required under the separately-issued MRP, are necessary to ensure compliance with prescribed WDRs and the provisions of Title 27.

Procedural Requirements

69. All local agencies with regulatory jurisdiction over land-use, solid waste disposal, air pollution and public health protection have approved the use of the Facility's site for the discharge of waste to land as provided for herein.
70. The Discharger interested agencies and interested persons were notified of the Central Valley Water Board's intent to prescribe the WDRs in this Order and

provided an opportunity to submit their written views and recommendations at a public hearing. (Wat. Code, § 13167.5; Title 27, § 21730.)

71. At a public meeting, the Central Valley Water Board heard and considered all comments pertaining to the discharges regulated under this Order.

REQUIREMENTS

IT IS HEREBY ORDERED, pursuant to Water Code sections 13263 and 13267, that Order R5-2004-0104 is hereby rescinded (except for enforcement purposes); and the City of Roseville (Discharger) and its agents, successors, and assigns, in accordance with Water Code division 7 (§ 13000 et seq.), shall comply with the following requirements.

A. Discharge Prohibitions

The discharge of any additional waste at this site is prohibited.

1. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.
2. The discharge of treated or untreated wastewater, sump liquid, or groundwater to any surface water or any surface water drainage course is prohibited without a National Pollutant Discharge Elimination System (NPDES) permit authorizing the discharge.
3. Neither the treatment nor the discharge of wastes shall cause a pollution or a nuisance, as defined by the California Water Code, Section 13050.

B. Discharge Specifications

1. The discharge shall remain within the designated disposal WMU at all times.
2. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order.
3. Storm water runoff from the facility shall be discharged in accordance with applicable storm water regulations.
4. A minimum separation of five feet shall be maintained between wastes or leachate and the highest anticipated elevation of underlying groundwater per Section 20240(c) of Title 27.

C. Facility Specifications

1. The Discharger shall comply with all Standard Facility Specifications (SPRRs, § E) which are incorporated herein.
2. The Discharger shall periodically inspect and maintain the LFG vent system, as necessary, to ensure that it is operating as designed. See MRP, section A.5.
3. The Dischargers shall continuously operate the passive LFG vent systems at WMUs B and C/D for corrective action of releases of VOCs to groundwater until groundwater throughout the zone affected by the release is returned to background conditions (constituents achieve their respective concentration limits) pursuant to Title 27, section 20430, and the Discharger demonstrates completion of the corrective action program pursuant to Title 27, section 20430(g) to the satisfaction of the Executive Officer.

D. Construction Specifications

Except as otherwise expressly directed below, the Dischargers shall comply with all Standard Construction Specifications and Standard Storm Water Provisions (SPRRs, §§ D, L), which are incorporated herein, as well as the following.

1. The Dischargers shall not alter the design or disturb containment components (e.g., LHC layer) of any portion of the final cover over a landfill unit (other than preparatory earthmoving and grading) until the Central Valley Water Board has approved in writing all necessary construction plans, specifications and construction quality assurance plans related to the final cover repairs or revisions.
2. Earthen materials used in containment structures (i.e., LHC layer of final cover) shall consist of a mixture of clay and other suitable fine-grained soils which have the following characteristics, and which, in combination, can be compacted to attain the required hydraulic conductivity when installed.
 - a. At least 30 percent of the material, by weight, shall pass a No. 200 U.S. Standard sieve.
 - b. The materials shall be fine grained soils with a significant clay content and without organic matter, and which is a clayey sand, clay, sandy or silty clay, or sandy clay under a soil classification system having industry-wide use [e.g., the “SC”, “CL”, or “CH” soil classes under ASTM Designation: A2487-93 Standard

Classification of Soils for Engineering Purposes (Unified Soil Classification System)]. See Title 27, section 20320(d).

3. The materials used for the foundation layer shall have appropriate engineering properties for a foundation layer in accordance with Section 21090(a)(1). The foundation layer shall be engineered to minimize the potential for differential settlement so as not to affect the structural integrity of the final cover.

E. Post-Closure Specifications

1. The Discharger shall maintain waste containment facilities, the landfill final cover, precipitation and drainage controls, monitoring wells, and shall continue to monitor ground water and surface waters per Monitoring and Reporting Program No. R5-2019-XXXX throughout the post-closure maintenance period.
2. All final cover slopes shall be capable of withstanding a maximum probable earthquake.
3. Despite differential settlement, the final cover shall be graded and maintained to prevent ponding, promote lateral runoff, and prevent soil erosion due to high run-off velocities.
4. The vegetative cover layer shall be maintained with native or other vegetation capable of providing effective erosion resistance.
5. The Discharger shall conduct an aerial site survey of the site for the purpose of updating the topographic map for the site at least every five years.
6. Precipitation and drainage control systems shall be operated and maintained to convey peak flows from a 100-year, 24-hour storm event.
7. Annually, prior to the anticipated rainy season but no later than 31 October, any necessary erosion control measures shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent storm water flows from:
 - a. Contacting or percolating through wastes,
 - b. Causing erosion or inundation of the landfill cover or other WMUs of the site, or
 - c. Causing sedimentation and clogging of the storm drains.

8. Any proposed change in post-closure use shall be in accordance with Section 21190 of Title 27.
9. By **15 February 2020**, the Discharger shall submit an updated PCMP that includes updated financial assurance cost estimates for landfill postclosure maintenance and corrective action. See Finding 56 and Time Schedule I.C.a.

F. Financial Assurances

Except as otherwise directed below, the Discharger shall comply with all Standard Financial Assurance Provisions (SPRRs, § H), as well as the following.

1. The Discharger shall maintain with the Central Valley Water Board assurances of financial responsibility for the estimated costs specified in the most recently-approved PCMP, adjusted annually for inflation. See Postclosure Specification E.9.
2. A financial assurances report meeting the requirements of CalRecycle shall be submitted to the Central Valley Water Board annually, no later than 1 June.
3. If the determines that the Discharger's financial assurances for the facility are inadequate, the Discharger shall, within 90 days of such determination:
 - a. Obtain a new financial assurance mechanism for the amount specified by the Central Valley Water Board; and
 - b. Submit a report documenting such financial assurances to the Central Valley Water Board.
4. Whenever changed conditions increase the estimated costs of post-closure maintenance, Discharger shall promptly submit an updated PCPMP to the Central Valley Water Board, CalRecycle (CIA Unit), and the LEA.

G. Monitoring Specifications

Except as otherwise directed below, the Discharger shall comply with all applicable Standard Monitoring Specifications (SPRRs, § I) and Standard Response to Release Specifications (SPRRs, § J), as well as the following:

1. The Discharger shall comply with all provisions of the separately-issued MRP R5-2019-0056 and any subsequent revisions thereto.

2. The Discharger shall comply with the Water Quality Protection Standard (WQPS) set forth in the operative MRP (see also Title 27, § 20390); and shall verify the compliance of each WMU with each subsequent monitoring event.
3. For all WMUs, the Discharger shall implement a groundwater, surface water and unsaturated zone detection monitoring program (DMP), including background monitoring, in accordance with Title 27, sections 20385, 20415 and 20420. Unsaturated zone monitoring at the site may be limited to soil gas monitoring given that the landfill units are unlined.
4. For each WMU subject to corrective action, the Discharger shall implement a corrective action program (CAP), including corrective action monitoring, in accordance with Title 27, sections 20385, 20415 and 20430, and Section I of the SPRRs.
5. Absent approval of shared monitoring of landfill units consistent with Title 27 regulations, each WMU (i.e., B and C/D) shall, by **1 July 2020**, have a separate groundwater monitoring system. Approval of shared monitoring shall require a technical demonstration to the satisfaction of the Executive Officer as to the following:
 - a. Section 20405 (b) - That the subject units are contiguous and that monitoring along a shared boundary would impair the integrity of a containment or structural feature of any of the Units; and/or
 - b. Section 20415(e)(3) - That the subject units are contiguous, and that the proposed shared monitoring system will comply with Title 27 performance standards for background, detection and corrective action monitoring per Title 27, sections 20415(b) (1) & (2). be infeasible of separate monitoring to the satisfaction of the Executive Officer; and/or
 - c. Title 27, sections 20380(e) – That the proposed shared monitoring system qualifies as an engineered alternative design per Title 27, section 20080(c & d)

The above demonstration may be included in the Monitoring Data Evaluation Methods Report required under Monitoring Specification G.6 or the updated WQPS Report submitted under Monitoring Specification G.7.

6. By **31 October 2019**, the Discharger shall submit an updated Monitoring Data Evaluation Methods Report consistent with the requirements of this Order per Finding 30, Monitoring Specification G.5, and MRP section C.4.b.

7. By **31 March 2021**, the Discharger shall submit an updated WQPS report per Finding 31, MRP Section C.1, and Time Schedule I.B.b.
8. Constituents of concern (COC) in water passing through each WMU's Point of Compliance shall not exceed concentration limits specified (or referenced) in the MRP. The Point of Compliance is a vertical plane situated at the hydraulically downgradient limit of each WMU, extending through the uppermost underlying aquifer. (See Title 27, §§ 20164, 20405.)
9. Detection monitoring shall be conducted for at least three years after completion of corrective action of a unit (including any applicable "proof period") to demonstrate that groundwater down gradient of the unit follows the Water Quality Protection Standard. (This requirement shall not apply to former WMU A). See Title 27, sections 20380(d) and 20430(g).

H. General Provisions

Except as otherwise expressly directed below, the Discharger shall comply with the Standard General Provisions (SPRRs, § K), as well as the following.

1. Notwithstanding Section G.1, the provisions of this Order shall supersede any contrary provision in MRP R5-2019-0056 and revisions thereto.
2. The Discharger shall comply with all applicable provisions of Title 27 and Code of Federal Regulations, title 40, part 258, including those not specifically referenced in this Order.
3. Measures implemented as part of a Corrective Action Program (e.g., landfill gas venting) shall not be terminated without express written approval by the Executive Officer. Central Valley Water Board staff shall be notified of all LFG vent shutdowns lasting longer than one week. For the purposes of this provision, "terminated" does not include:
 - a. Vent shutdowns of less than one week (e.g., routine maintenance); and
 - b. Planned periods of vent system nonoperation, if previously-approved in writing by Central Valley Water Board staff.
4. The Discharger shall ensure that operating personnel are familiar with this Order (including all attachments and SPRRs) and the operative MRP, both of which shall always be kept onsite and made available to operating personnel and regulatory agency personnel.
5. All reports and monitoring data shall be submitted online in an

appropriately-formatted file via the State Water Board’s **GeoTracker** Database, at <https://geotracker.waterboards.ca.gov/>. (Title 23, §§ 3892(d), 3893.) Additional information regarding electronic submittals is accessible through the “Information” tab on the GeoTracker homepage. After uploading a document via GeoTracker, the submitting party shall notify Central Valley Water Board staff via email at centralvalleysacramento@waterboards.ca.gov, including the following information body of the email:

Attention:	Title 27 Compliance & Enforcement Unit, <i>or</i> Title 27 Permitting & Mining Unit
Report Title:	[title of submitted report]
Discharger:	City of Roseville
Facility:	Roseville Landfill
County:	Placer
CIWQS ID:	253341

6. All reports and workplans that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geological sciences, shall:
 - a. Be prepared by, or under the direction of, professionals registered to practice in California pursuant to Business and Professions Code sections 6735, 7835 and 7835.1; and
 - b. Bear the signature(s) and seal(s) of the responsible registered professional(s) described above.

I. Time Schedule

The Discharger shall complete all tasks according to the time schedule set forth below.

<u>Task</u>	<u>Compliance Date</u>
A. CONSTRUCTION	
a. Submit construction and design plans, including quality assurance (CQA) plan for review and approval. (See Construction, § D; SPRRs, § I.)	90 days prior to proposed construction date
b. Submit a construction report for review and approval upon completion demonstrating construction in accordance with approved	Within 60 days of completing

- construction plans. (See SPRRs, § F.27.) **construction**
- B. GROUNDWATER MONITORING**
- a. Submit updated Monitoring Data Analysis Methods Report per Monitoring Specification G.6. **31 October 2019**
- b. Submit updated Water Quality Protection Standard Report per Finding 31, Monitoring Specification G.7 and MRP Section C.1. **31 March 2021**
- C. POSTCLOSURE**
- a. Submit updated PCMP including updated landfill postclosure maintenance and corrective action cost estimates per Postclosure Specification E.9. **15 February 2020**
- D. FINANCIAL ASSURANCES**
- a. Submit proof of required financial assurances per Financial Assurances Specification F.2. **1 June 2020 and annually thereafter**

Persons aggrieved by this Central Valley Water Board action may petition the State Water Board for administrative review in accordance with Water Code section 13320, and California Code of Regulations, title 23, section 2050 et seq. To be timely, a petition must be received by the State Water Board no later than 5 pm on 30th day after the date that this Order becomes final. However, if the 30th day falls on a Saturday, Sunday or state holiday, the petition must be received by the State Water Board by 5 pm on the next business day. Copies of the law and regulations applicable to filing petitions are available online (at the address below) and will be provided upon request.

I, PATRICK PULUPA, Executive Officer, do hereby certify that 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 7 June 2019


PATRICK PULUPA, Executive Officer

Order Attachments

JDM

GLOSSARY OF COMMON ABBREVIATIONS, ACRONYMS & TERMS

ADC.....	Alternative Daily Cover
<i>Antidegradation Policy.....</i>	<i>Statement of Policy with Respect to Maintaining High Quality Waters in California, State Water Board Resolution 68-16</i>
bgs	Below Ground Surface
BPTC.....	Best Practicable Treatment and Control
C&D.....	Construction and Demotion Materials
CalRecycle	California Department of Resources Recovery and Recycling
CAP	Corrective Action Program
CAMP.....	Corrective Action Monitoring Program
CEQA	California Environmental Quality Act
CEQA Guidelines	California Code of Regulations, Title 14, section 15000 et seq.
C.F.R.....	Code of Federal Regulations
COCs	Constituents of Concern
C-Soil	Contaminated Soil
CQA	Construction Quality Assurance
DEIR.....	Draft Environmental Impact Report
DMP	Detection Monitoring Program
DTSC	California Department of Toxic Substances Control
DWR.....	California Department of Water Resources
EC	Electrical Conductivity
EIR	Environmental Impact Report
EMP	Evaluation Monitoring Plan
FCPMP.....	<u>Final</u> Closure and Post-Closure Maintenance Plan

FEIR	Final Environmental Impact Report
FEMA	Federal Emergency Management Agency
GCL.....	Geocomposite Liner
HDPE	High-Density Polyethylene
JTD.....	Joint Technical Document
LCRS.....	Leachate Collection and Removal System
LEA	Local Enforcement Agency
LFG	Landfill Gas Condensate
MCE	Maximum Credible Earthquake
MDB&M.....	Mount Diablo Base and Meridian
MDL.....	Method Detection Limit
µg/L.....	Micrograms per Liter
mg/L	Milligrams per Liter
MPE	Maximum Probable Earthquake
msl.....	Mean Sea Level
MRP	Monitoring and Reporting Program
MSW	Municipal Solid Waste
MSWLF	Municipal Solid Waste Landfill
MW.....	Monitoring Well
PCPMP	<u>Preliminary</u> Closure and Post-Closure Maintenance Plan
SPRRs	Standard Provisions and Reporting Requirements
Subtitle D.....	USEPA-promulgated MSW regulations under RCRA (see 40 C.F.R. part 258)
RCRA	Resource Conservation and Recovery Act
ROWD.....	Report of Waste Discharge

TDS Total Dissolved Solids
Title 22 California Code of Regulations, Title 22
Title 23 California Code of Regulations, Title 23
Title 27 California Code of Regulations, Title 27
USEPA..... United States Environmental Protection Agency
VOCs..... Volatile Organic Compounds
WDRs..... Waste Discharge Requirements
WMU Waste Management Unit
WQPS Water Quality Protection Standard

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2019-0056
FOR
CITY OF ROSEVILLE
ROSEVILLE LANDFILL
CLASS III LANDFILLS
POST-CLOSURE MAINTENANCE AND CORRECTIVE ACTION
PLACER COUNTY

This monitoring and reporting program (MRP) is issued pursuant to Water Code section 13267, and incorporates requirements for groundwater, surface water, and unsaturated zone monitoring and reporting; facility monitoring, maintenance, and reporting; and financial assurances reporting contained in California Code of Regulations, title 27 (Title 27), section 20005 et seq., Waste Discharge Requirements Order R5-2019-0056 (WDRs), and the Standard Provisions and Reporting Requirements, December 2015 Edition (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.

A. Monitoring

The Discharger shall comply with the detection, evaluation, and corrective action monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone in accordance with Standard Monitoring Specifications in Section I of the SPRRs and the Monitoring Specifications in Section G of the WDRs. All monitoring shall be conducted in accordance with the currently-approved Sample Collection and Analysis Plan and Water Quality Protection Standard (WQPS) Report.

All compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater WQPS. Except where otherwise specified herein, all groundwater monitoring wells, unsaturated zone monitoring devices, leachate, and surface water monitoring points shall be sampled and analyzed for monitoring parameters and constituents of concern (COCs) as indicated and listed in Tables I through V.

The Discharger may use alternative analytical test methods, including new USEPA approved methods, provided the methods have method detection limits equal to or lower than the analytical methods specified in Tables IV and V of this Monitoring and Reporting Program, and are identified in the approved Sample Collection and Analysis Plan.

The monitoring program of this MRP includes:

<u>Section</u>	<u>Monitoring Program</u>
A.1	Groundwater Monitoring
A.2	Unsaturated Zone Soil Gas Monitoring
A.3	Leachate Seep Monitoring
A.4	Surface Water Monitoring
A.5	Facility Monitoring
A.6	Standard Observations

1. Groundwater Monitoring

The Discharger shall operate and maintain groundwater detection and corrective action monitoring systems that comply with the applicable provisions of Title 27, sections 20415 through 20430. These groundwater monitoring systems shall be certified by a California-licensed professional civil engineer or geologist as meeting the requirements of Title 27.

Areas B and C/D are in concurrent detection and corrective action monitoring to monitor the historical releases from those units. This groundwater monitoring system meets the applicable requirements of Title 27, except where noted (or footnoted) that approvals are needed per the monitoring specifications of the WDRs.

a. Monitoring Points (See Attachment B: Site Map)

a) Area B

<u>Zone</u>	<u>Program</u>	<u>Wells</u> ¹	<u>Location</u>
	Background	MW-2 ^{2,3} , MW-3 ^{2,3}	Upgradient
Upper	Detection & Corrective Action	MW-15	Downgradient
		MWs- 9 ² , 10A, & 10B ²	Side gradient

1. Wells screened in Riverbank Formation unless otherwise noted.
 2. Well screened in Valley Springs/Mehrten Formation.
 3. Any pooling and/or sharing of background monitoring data shall be consistent with the technical reports submitted under Monitoring Specifications G.5 through G.7, as approved.

b) Area C/D

<u>Zone</u>	<u>Program</u>	<u>Wells¹</u>	<u>Location</u>
Upper	Background	MW-2 ^{2,3} , MW-3 ^{2,3}	Upgradient
	Detection & Corrective Action	MWs- 5 ² , 8, 13, 14 & 16	Downgradient

1. Wells screened in Riverbank Formation unless otherwise noted.
2. Well screened in Valley Springs/Mehrten Formation.
3. Any pooling and/or sharing of background monitoring data shall be consistent with the technical reports submitted under Monitoring Specifications G.5 through G.7, as approved.

Any monitoring wells installed after the adoption of this Order shall become part of the monitoring network and are subject to the requirements of this Order. Monitoring of offsite wells MWs- 6 and 7a is not required under this MRP but may be conducted voluntarily and reported under this MRP.

b. Monitoring Schedule & Procedure

Once per quarter, the Discharger shall measure the groundwater elevation in each well/piezometer, determine groundwater flow direction, and estimate groundwater flow rates in the uppermost aquifer and in any zones of perched water and in any additional portions of the zone of saturation monitored.¹ 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).

Groundwater samples shall be collected from all background wells, detection monitoring wells, corrective action monitoring wells included in the above tables, and any additional wells added as part of the approved groundwater monitoring system. The collected samples shall be analyzed for the parameters and constituents listed in Table I in accordance with the specified methods and frequencies. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the currently-approved Sample Collection and Analysis Plan.

Samples collected for the COC monitoring specified in Table I shall be collected and analyzed in accordance with the methods listed in Table V every five years. Five-year COCs were last monitored in **2015** and shall

1. Section 20415(e)(15) prescriptive requirement for minimum quarterly groundwater elevation monitoring frequency not required for this site per Section 20080(g).

be monitored again in **2020**. The results shall be reported in the Annual Monitoring Report for the year in which the samples were collected.

2. Unsaturated Zone Monitoring

The Discharger shall operate and maintain an unsaturated zone detection monitoring system that complies with the applicable provisions of Title 27, sections 20415 and 20420.

a. Soil Gas/LFG

a) Monitoring Points

<u>Units</u>	<u>Well(s)</u>	<u>Location</u>	<u>Completion</u>	<u>Screen¹</u>
A	---	---	---	---
B	LFG-1 ²	125 feet west of unit	Dual	Shallow & Deep
	LFG-8 ²	300 feet north of unit		
C/D	LFGs-4, 5, & 7	Unit Perimeter	Single	Shallow
	LFGs-3, 9, 10, & 11 ²		Dual	Shallow & Deep

1. Screen depths relative to landfill waste column.
2. Perimeter methane migration monitoring wells required by Local Enforcement Agency (LEA)

b) Monitoring Schedule & Procedure

Soil-pore gas samples shall be collected from the monitoring network listed above and analyzed in accordance with the following schedule.

<u>Parameters</u>	<u>Units</u>	<u>Monitoring Freq.</u>	<u>Reporting Freq.</u>
<i>Field Parameters¹</i>			
Methane	%	Semiannually	Semiannually
Carbon Dioxide	%	Semiannually	Semiannually
Organic Vapors	ppmv	Semiannually	Semiannually
<i>Monitoring Parameters</i>			
VOCs ^{2,3}	µg/cm ³	Semiannually	Semiannually

1. Field gas monitoring shall be conducted using appropriate field meter(s).
2. VOC sampling shall be required in all probes in which methane detected above 2.5% by volume and/or total organic vapors detected above 1 ppmv during monitoring event.
3. VOC analysis shall be conducted using USEPA Method TO-15.

The Discharger shall collect, preserve, and transport samples in accordance with the quality assurance/quality control standards contained in the approved Sample Collection and Analysis Plan. Monitoring results for the unsaturated zone shall be included in monitoring reports and shall include an evaluation of potential impacts of the facility on the unsaturated zone and compliance with the Water Quality Protection Standard.

The above unsaturated zone monitoring system meets the applicable requirements of Title 27.

3. Leachate Monitoring

Leachate that seeps to the surface from a landfill unit shall be sampled and analyzed for the Field and Monitoring Parameters listed in Table II upon detection. The quantity of leachate shall be estimated and reported as Leachate Flow Rate (in gallons/day). Reporting for leachate seeps shall be conducted as required in Section B.3.c of this MRP, below.

4. Surface Water Monitoring

The Discharger shall operate a surface water monitoring system to monitor each surface water body that could be affected by a release from the landfill units per Title 27, section 20415(c).

a. Monitoring Points

Surface water monitoring shall be conducted at the following locations in the onsite stream (Antelope Creek): S-1 (upstream), S-2 (between Areas B and C/D), and S-3 (downstream). See Attachment B: Site Map.

b. Monitoring Schedule

For surface water detection monitoring, a sample shall be collected from a representative location within the creek at a given monitoring location and analyzed for the monitoring parameters and constituents in accordance with the methods and frequency specified in Table III. All surface water monitoring samples shall be collected and analyzed for the 5-year COCs specified in Table III every five years, beginning in **2020**. Surface water monitoring in Antelope Creek may be limited to the dry season (e.g., May and September).

5. 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 drainage control systems, cover systems, gas monitoring and control facilities, and groundwater monitoring wells; and shall assess preparedness for winter conditions (including but not limited to erosion and sedimentation control). The Discharger shall take photos of any problem 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.d of this MRP.

b. Major Storm Events

The Discharger shall inspect all precipitation, diversion, and drainage facilities and all landfill side slopes for damage **within 7 days** following major storm events capable of causing damage or significant erosion. The Discharger shall take photos of any problem 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.3.e of this MRP.

c. Five-Year Topographic Surveys

The Discharger shall conduct an aerial topographic survey of the site every five years. Five-year surveys shall be used to produce an iso-settlement map accurately depicting the estimated total change in elevation of each portion of the final cover's low-hydraulic-conductivity layer. For each portion of the landfill, this map shall show the total lowering of the surface elevation of the final cover, relative to the baseline topographic map [Title 27, section 21090(e)(1 & 2)]. Reporting shall be in accordance with Section B.3.f of this MRP. The most recent topographic survey of the site was conducted in **2017**. The next topographic surveys of the site shall therefore be conducted in **2022** and every five years thereafter.

Facility monitoring shall also include **quarterly inspection of all monitoring and control systems** to ensure that they are in good working order (e.g., gas vents).

6. Standard Observations

The Discharger shall conduct Standard Observations at the landfill in accordance with this section of the MRP. Standard observations shall be conducted in accordance with the following schedule:

<u>Landfill Unit</u>	<u>Frequency</u>	<u>Season</u>
WMUs B and C/D	Monthly	Wet: 1 October to 30 April
	Quarterly	Dry: 1 May to 30 September

Standard Observations shall include:

a. Landfill Units

- a) Evidence of ponded water at any point on the landfill outside of any contact storm water/leachate diversions structures on the active face (show affected area on map); and
- b) Evidence of erosion and/or of day-lighted refuse.

b. Landfill Unit Perimeters

- a) Evidence of leachate seeps, estimated size of affected area, and flow rate (show affected area on map); and
- b) Evidence of erosion and/or of day-lighted refuse.

c. Receiving Waters

- a) Floating and suspended materials of waste origin - presence or absence, source, and size of affected area; and
- b) Discoloration and turbidity - description of color, source, and size of affected area.

The results of Standard Observations shall be submitted in the semiannual monitoring reports required in Section B.1 of this MRP.

B. Reporting

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

1. Reporting Schedule

<u>Section</u>	<u>Report</u>	<u>End of Reporting Period</u>	<u>Due Date</u>
B.3.a	Semiannual Monitoring Report	30 June, 31 December	1 August, 1 February
B.3.b	Annual Monitoring Report	31 December	1 February
B.3.c	Seep Reporting	Continuous	Immediately & 7 Days
B.3.d	Annual Facility Inspection Report	31 October	15 November
B.3.e	Major Storm Event Reporting	Continuous	7 days from damage discovery
B.3.f	Survey and Iso-Settlement Map for Closed Landfills	Every Five Years	31 December 2020 and every five years thereafter
B.3.g	Financial Assurances Report	31 December	1 June

2. 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 No. R5-2019-XXXX and the SPRR (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, such as a computer disk.

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 including the post-closure period. Such records shall be legible and shall show the following for each sample:

- 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;
- Date, time, and manner of sampling;
- Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;
- Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
- Calculation of results; and
- Results of analyses, and the MDL and PQL for each analysis. All peaks shall be reported.

3. Required Reports

a. 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) Semiannual groundwater elevation contour maps based on required groundwater elevation measurements for the monitoring period); and estimated 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, unsaturated zone, leachate, and surface water. 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 I through III 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 (or 5-year COC when five-year COC sampling is conducted) 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 for verified exceedances of a concentration limit.
 - g) An evaluation of the effectiveness of the run-off/run-on control facilities and a discussion of any necessary repairs implemented or planned.

- h) A summary of the results of Facility Monitoring for the reporting period, as applicable, per Section A.5 of this MRP.
- i) A summary of all Standard Observations for the reporting period required in Section A.6 of this MRP.
- j) A summary of inspection, leak search, and repair of final covers on any closed landfill units in accordance with an approved final post-closure maintenance plan as required by Standard Closure and Post-Closure Maintenance Specifications G.26 through G.29 of the SPRRs.

b. 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 information:

- 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. If a 5-year COC event was performed, then these parameters shall also be graphically presented. 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) An evaluation of the monitoring parameters with regards to the cation/anion balance, and a graphical presentation using a Stiff diagram, a Piper graph, or a Schoeller plot.
- c) 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.
- d) 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 semiannually and submitted annually.

- e) 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.
- f) A written summary of the monitoring results, indicating any changes made or observed since the previous Annual Monitoring Report.
- g) Updated concentration limits for each monitoring parameter at each monitoring well based on the new data set.
- h) A comprehensive discussion of the correction action program required by this MRP, including the following:
 - 1) Trend analysis for VOCs and any inorganic constituents detected above the concentration limits in each corrective action well.
 - 2) Whether there is further migration of VOCs in groundwater.
 - 3) Whether any monitoring wells have been impacted by any new VOCs.
 - 4) Whether the concentration of VOCs in groundwater, including total VOCs, has increased, decreased, or remained constant.
 - 5) Whether methane exceedances have been detected in any of the soil gas monitoring probes; whether the probes were required to be tested for VOCs under the MRP, and, if so, the sampling results.

c. Seep Reporting

The Discharger shall report by telephone any seepage from the disposal area **immediately** after it is discovered. A written report shall be filed with the Central Valley Water Board **within seven days**, containing at least the following information:

- a) A map showing the location(s) of seepage;
- b) An estimate of the flow rate;

- c) A description of the nature of the discharge (e.g., all pertinent observations and analyses);
- d) Verification that samples have been submitted for analyses of the Field Parameters and Monitoring Parameters listed in Table II of this MRP, and an estimated date that the results will be submitted to the Central Valley Water Board; and
- e) Corrective measures underway or proposed, and corresponding time schedule.

d. 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. Refer to Section A.5.a of this MRP, above.

e. Major Storm Event Reporting

Following major storm events capable of causing damage or significant erosion, the Discharger **immediately** shall notify Central Valley Water Board staff of any damage or significant erosion upon discovery and report subsequent repairs within **14 days** of completion of the repairs, including photographs of the problem and the repairs. Refer to Section A.5.b of this MRP, above.

f. Survey and Iso-Settlement Map for Closed Landfill

The Discharger shall conduct a survey and submit an iso-settlement map for the closed landfill every five years pursuant to Title 27, section 21090(e) in accordance with Section A.5.c of this MRP, above.

g. Financial Assurances Report

By **1 June** of each year, the Discharger shall submit a copy of the annual financial assurances report due to CalRecycle that updates the financial assurances for closure, post-closure maintenance, and corrective action. Refer to Financial Assurances Specifications of the WDRs.

C. Water Quality Protection Standard and Compliance Period

1. Water Quality Protection Standard Report

For each waste management unit, the Water Quality Protection Standard (WQPS) 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 report shall:

- a.** Identify all distinct bodies of surface and ground water that could be (or have been) affected by a release from a waste management unit or portion of a unit. This list shall include the uppermost aquifer, other aquifers that could potentially be (or have been) affected by a release, 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 for each unit. The map shall include the point of compliance of each unit in accordance with Title 27, section 20405.
- c.** Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).
- d.** Include (or reference a separately-submitted technical report) proposing statistical methods for calculating concentration limits for monitoring parameters and constituents of concern that are detected in 10% or greater of the background data (e.g., 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 WQPS 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 waste management activities at the site, the Discharger may propose modification of the WQPS. The Water Quality Protection Standard shall be updated annually in the Annual Monitoring Report using new and historical monitoring data.

The WQPS Report was last revised submitted in July 2016. These WDRs require that the Discharger submit a revised WQPS Report to reflect the requirements of this Order. See WDR Monitoring Specification G.8. Monitoring data analysis methods consistent with the currently-approved WQPS for the Facility are referenced in Section C.4 of this MRP.

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 waste management unit. The monitoring parameters for all waste management units are those listed in Tables I through III for the specified monitored medium.

3. Constituents of Concern (COCs)

The COCs include a larger group of waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the waste management unit and are required to be monitored every five years [Title 27, sections 20395 and 20420(g)]. The COCs for all waste management units at the facility are those listed in Tables I through III for the specified monitored medium, and Table V. The Discharger shall monitor all COCs every five years, or more frequently as required in accordance with a Corrective Action Program. The last 5-year COC report was submitted to the Central Valley Water Board in the 2015 *Annual Monitoring Report*, and 5-year COCs are due to be monitored again in **2020**.

4. Concentration Limits

Proposed concentration limits for all applicable water bearing media (i.e., surface water and groundwater) shall be included in the revised WQPS Report required under WDR Monitoring Specification G.8.

For a naturally occurring constituent of concern, the concentration limit for each constituent of concern shall be determined by calculation in accordance with a statistical method pursuant to Title 27, section 20415(e)(8); or by an alternate statistical method meeting the requirements of Title 27, section 20415(e)(8)(E).

a. Detection Monitoring

a) Non-naturally occurring COCs

The concentration limits for non-naturally-occurring constituents of concern, including organic compounds (e.g., VOCs and dissolved metals not detectable in background), shall be the laboratory method detection limit (MDL).

b) Naturally Occurring COCs

The Discharger shall use interwell statistics for naturally-occurring constituents. Background data sets shall be developed for upper zone groundwater at each unit. Each unit shall be separately

monitored absent a demonstration under Title 27 that separate monitoring of the units is not feasible. The data analysis method for calculating concentration limits for naturally occurring COCs under this Order shall be the interwell Tolerance Limit Method, or as otherwise proposed in the currently approved WQPS Report or separate technical report referenced therein. See WDR Monitoring Specifications G.6 and G.8. Concentration limits for naturally occurring COCs shall be updated annually and included in the Annual Monitoring Report submitted under Section B.2.g) of this MRP.

b. Corrective Action Monitoring

For wells in the corrective action program, the concentration limits represent cleanup levels to achieve background concentrations. The concentration limits for corrective action monitoring shall generally be the same as those for detection monitoring absent approval of a proposal for concentration limits greater than background (CLGBs) under Title 27 Section 20400(c) and revision of the WDRs. Time series plots and/or an intrawell statistical procedure (e.g., Mann-Kendall test) shall be used for trend analysis to monitor corrective action progress.

a) Updated Monitoring Data Analysis Methods

The monitoring data analysis methods currently used by the Discharger for calculating concentration limits were provided in Appendix G of the 2018 Annual Water Quality Monitoring Report submitted under previous WDRs. The procedure includes screening for outliers and background trend analysis. Concentration limits were calculated using the USEPA's ProUTL software program based on pooling background data for monitoring wells MWs-1, 2 and 3.²

This Order requires that the Discharger submit an updated Monitoring Data Evaluation Methods Report consistent with the requirements of this Order, including the need for separate monitoring of the landfill units at the site (i.e., WMU B and WMU C/D) per Title 27 requirements, or a demonstration for shared monitoring of the units per Monitoring Specification G.5. The adequacy of background monitoring at the units also needs to be addressed, including a justification for any constituents for which background data is pooled

² U.S. Environmental Protection Agency (EPA) *ProUCL Version 5.1.00, Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations*, Office of Research and Development, September 2016.

per Title 27, section 20415(e)(10). See WDR Finding 30 and Monitoring Specification G.6.

5. 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.45 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.46 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.47 of the SPRRs.

6. Point of Compliance

The point of compliance for the water standard at each waste management 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>
Former WMU-A	Not applicable.
WMU-B	MW-15
WMU-C/D	MWs-8 and 13

7. Compliance Period

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

8. 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.

I, PATRICK PULUPA, Executive Officer, do hereby certify the forgoing is a full, true and correct copy of the Monitoring and Reporting Program adopted by the California Regional Water Quality Control Board, Central Valley Region, on 7 June 2019.



PATRICK PULUPA, Executive Officer

TABLE I
GROUNDWATER DETECTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u> ¹	<u>Geotracker Code</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Field Parameters				
Groundwater Elevation	Ft. & 100ths, MSL.	GWELEV	Semiannual	Semiannual
Temperature	°F	TEMP	Semiannual	Semiannual
Electrical Conductivity	µmhos/cm	SC	Semiannual	Semiannual
pH	pH units	PH	Semiannual	Semiannual
Turbidity	NTU	TURB	Semiannual	Semiannual
Dissolved Oxygen	mg/L	DO	Semiannual	Semiannual
Oxidation-Reduction Potential	mV	REDOX	Semiannual	Semiannual
Monitoring Parameters				
Total Dissolved Solids	mg/L	TDS	Semiannual	Semiannual
Chemical Oxygen Demand	mg/L	COD	Semiannual	Semiannual
General Minerals				
Bicarbonate Alkalinity	mg/L	BICACO3		
Chloride	mg/L	CL	Semiannual	Semiannual
Nitrate as Nitrogen	mg/L	NO3N	Semiannual	Semiannual
Sulfate	mg/L	SO4	Semiannual	Semiannual
Calcium	mg/L	CA	Semiannual	Semiannual
Magnesium	mg/L	MG	Semiannual	Semiannual
Potassium	mg/L	K	Semiannual	Semiannual
Sodium	mg/L	NA	Semiannual	Semiannual
Dissolved Inorganics Short List	µg/L	See Table IV	Semiannual	Semiannual
VOC Short List	µg/L	See Table IV	Semiannual	Semiannual
5-Year COCs (see Table V)				
Total Organic Carbon	mg/L	TOC		
Inorganics (dissolved)	µg/L			
VOCs, extended list	µg/L			
Semi-Volatile Organic Compounds (Semi-VOCs)	µg/L			
Chlorophenoxy Herbicides	µg/L	See Table V	Every 5 years	1 February 2021 & Every 5 years thereafter
Organophosphorus Compounds	µg/L			
Organochlorine Pesticides	µg/L			
Polychlorinated Biphenyls	µg/L			

1. mg/L = milligrams per liter; µg/L = micrograms per liter.

TABLE II
LEACHATE SEEP MONITORING

<u>Parameter/Constituent</u>	<u>Units</u>	<u>Geotracker Code</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u> ¹
Field Parameters				
Total Flow (estimate)	Gallons			If seep detected
Flow Rate (estimate)	Gallons/Day	FLOW	"	"
Specific Conductance	µmhos/cm	SC	"	"
pH	pH units	PH	"	"
Monitoring Parameters				
Bicarbonate Alkalinity		BICACO3		
Chloride	mg/L	CL	"	"
Nitrate as Nitrogen	mg/L	NO3	"	"
Sulfate	mg/L	SO4	"	"
Total Dissolved Solids (TDS)	mg/L	TDS	"	"
VOC Short List	µg/L	See Table IV	"	"
Constituents of Concern				
Dissolved Inorganics	µg/L	See Table V	"	"
Semi-VOCs	µg/L	See Table V	"	"

1. The Discharger shall report by telephone immediately the leachate seep is discovered and file a written report with the Central Valley Water Board within seven days. See MRP Section 3.

TABLE III
SURFACE WATER DETECTION MONITORING PROGRAM

<u>Parameter/Constituent</u>	<u>Units</u>	<u>Geotracker Code</u>	<u>Sampling Frequency</u> ¹	<u>Reporting Frequency</u> ²
Field Parameters				
Specific Conductance	µmhos/cm	SC	Semiannual	Semiannual
pH	pH units	PH	Semiannual	Semiannual
Turbidity	Turbidity units	TURB	Semiannual	Semiannual
Dissolved Oxygen	mg/L	DO	Semiannual	Semiannual
Temperature	°F	TEMP	Semiannual	Semiannual
Oxidation-Reduction Potential	mV	REDOX	Semiannual	Semiannual
Flow to Waters of U.S.	Yes or No	FLOW	Semiannual	Semiannual
Monitoring Parameters				
Chloride	mg/L	CL	Semiannual	Semiannual
Total Alkalinity	mg/L	ALKH	Semiannual	Semiannual
Total Dissolved Solids	mg/L	TDS	Semiannual	Semiannual
Constituents of Concern				
General Minerals	mg/L			
VOCs, Extended List		See Table V	Every 5 years	1 February 2021 & Every 5 years thereafter
Dissolved Inorganics	µg/L			
Semi-VOCs				

1. Semiannual surface water monitoring may be limited to the dry season (e.g., May and September).
2. The Discharger shall report by telephone immediately the leachate seep is discovered and file a written report with the Central Valley Water Board within seven days. See MRP Section 3.

TABLE IV
DETECTION MONITORING PARAMETERS

<u>Parameter/Constituent</u>	<u>Test Method</u>	<u>Geotracker Code</u>
Field Parameters		
Groundwater Elevation	---	GWELEV
Temperature	---	TEMP
Specific Conductance	---	SC
pH	---	PH
Turbidity	---	TURB
Dissolved Oxygen	---	DO
Oxidation-Reduction Potential	---	REDOX
General Parameters		
Chemical Oxygen Demand	E410.4	COD
Total Alkalinity	SW2320B	ALKH
Total Dissolved Solids	SM2540C	TDS
Total Hardness	E130.2	HARD
Total Organic Carbon	SM5310B	TOC
General Minerals		
Major Anions		
Bicarbonate Alkalinity	E310.1	BICACO3
Chloride	E300.0	CL
Nitrate - Nitrogen	E300.0	NO3
Sulfate	E300.0	SO4
Major Cations		
Calcium	E200.7	CA
Magnesium	E200.7	MG
Potassium	E200.7	K
Sodium	E200.7	NA
Dissolved Inorganics (Short List)		
Arsenic	E200.8	AS
Barium	SW6010B	BA
Iron	SW6010B	FE
Manganese	SW6010B	MN
Volatile Organic Compounds, short list:	USEPA 8260B	<u>Geotracker Code</u>
Acetone		ACE
Acrylonitrile		ACRAMD
Benzene		BZ
Bromochloromethane		BRCLME
Bromodichloromethane		BDCME
Bromoform (Tribromomethane)		TBME
Carbon disulfide		CDS
Carbon tetrachloride		CTCL
Chlorobenzene		CLBZ
Chloroethane (Ethyl chloride)		CLEA
Chloroform (Trichloromethane)		TCLME

Volatile Organic Compounds, short list:	USEPA 8260B	<u>Geotracker Code</u>
Dibromochloromethane (Chlorodibromomethane)		DBCME
1,2 Dibromo 3 chloropropane (DBCP)		DBCP
1,2 Dibromoethane (Ethylene dibromide; EDB)		EDB
o Dichlorobenzene (1,2 Dichlorobenzene)		DCBZ12
m Dichlorobenzene (1,3 Dichlorobenzene)		DCBZ13
p Dichlorobenzene (1,4 Dichlorobenzene)		DCBZ14
trans 1,4 Dichloro 2 butene		DCBE14T
Dichlorodifluoromethane (CFC-12)		FC12
1,1 Dichloroethane (Ethylidene chloride)		DCA11
1,2 Dichloroethane (Ethylene dichloride)		DCA12
1,1 Dichloroethylene (1,1 Dichloroethene; Vinylidene chloride)		DCE11
cis 1,2 Dichloroethylene (cis 1,2 Dichloroethene)		DCE12C
trans 1,2 Dichloroethylene (trans 1,2 Dichloroethene)		DCE12T
1,2 Dichloropropane (Propylene dichloride)		DCPA12
cis 1,3 Dichloropropene		DCP13C
trans 1,3 Dichloropropene		DCP13T
Di-isopropylether (DIPE)		DIPE
Ethanol		ETHANOL
Ethyltertiary butyl ether		ETBE
Ethylbenzene		EBZ
2 Hexanone (Methyl butyl ketone)		HXO2
Hexachlorobutadiene		HCBU
Methyl bromide (Bromomethene)		BRME
Methyl chloride (Chloromethane)		CLME
Methylene bromide (Dibromomethane)		DBMA
Methylene chloride (Dichloromethane)		DCMA
Methyl ethyl ketone (MEK: 2 Butanone)		MEK
Methyl iodide (Iodomethane)		IME
Methyl t-butyl ether		MTBE
4-Methyl 2 pentanone (Methyl isobutylketone)		MIBK
Naphthalene		NAPH
Styrene		STY
Tertiary amyl methyl ether		TAME
Tertiary butyl alcohol		TBA
1,1,1,2 Tetrachloroethane		TC1112
1,1,1,2 Tetrachloroethane		PCA
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)		PCE
Toluene		BZME
1,2,4-Trichlorobenzene		TCB124
1,1,1 Trichloroethane (Methylchloroform)		TCA111
1,1,2 Trichloroethane		TCA112

Volatile Organic Compounds, short list:	USEPA 8260B	<u>Geotracker Code</u>
Trichloroethylene (Trichloroethene)		TCE
Trichlorofluoromethane (CFC 11)		FC11
1,2,3 Trichloropropane		TCPR123
Vinyl acetate		VA
Vinyl chloride		VC
Xylenes		XYLENES

TABLE V
5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

<u>Constituent</u>	<u>General Parameters</u>	
	<u>USEPA Method</u>	<u>Geotracker Code</u>
Total Dissolved Solids	2540C	TDS
Chemical Oxygen Demand	E410	COD
General Minerals		
Bicarbonate Alkalinity	2320B	BICACO3
Chloride	E300A	CL
Nitrate as Nitrogen	E353	NO3N
Sulfate	E300A	SO4
Calcium	E200.7	CA
Magnesium	E200.7	MG
Potassium	E200.7	K
Sodium	E200.7	NA

<u>Constituent</u>	<u>Dissolved Inorganics</u>	
	<u>USEPA Method</u>	<u>Geotracker Code</u>
Antimony	E200.7	AL
Barium	E200.7	BA
Beryllium	E200.7	BE
Chromium, Total	E200.7	CR
Cobalt	E200.7	CO
Copper	E200.7	CU
Silver	E200.7	AG
Tin	E200.7	SN
Vanadium	E200.7	V
Zinc	E200.7	ZN
Iron	E200.7	FE
Manganese	E200.7	MN
Nickel	E200.7	NI
Selenium	E200.7	SE
Thallium	E200.7	TL
Cyanide	SM4500-CN	CN
Sulfide	SM4500-S2	S
Heavy Metals		
Arsenic	E200.8	AS
Antimony	E200.8	SB
Cadmium	E200.8	CD
Chromium, Hexavalent	E218.6	CR6
Lead	E200.8	PB

Mercury

E245.1

HG

Volatile Organic Compounds

USEPA Method 8260B

Constituent

Geotracker

Code

Acetone	ACE
Acetonitrile (Methyl cyanide)	ACCN
Acrolein	ACRL
Acrylonitrile	ACRAMD
Allyl chloride (3-Chloropropene)	CLPE3
Benzene	BZ
Bromochloromethane (Chlorobromomethane)	BRCLME
Bromodichloromethane (Dibromochloromethane)	DBCME
Bromoform (Tribromomethane)	TBME
Carbon disulfide	CDS
Carbon tetrachloride	CTCL
Chlorobenzene	CLBZ
Chloroethane (Ethyl chloride)	CLEA
Chloroform (Trichloromethane)	TCLME
Chloroprene	CHLOROPRENE
Dibromochloromethane (Chlorodibromomethane)	DBCME
1,2-Dibromo-3-chloropropane (DBCP)	DBCP
1,2-Dibromoethane (Ethylene dibromide; EDB)	EDB
o-Dichlorobenzene (1,2-Dichlorobenzene)	DCBZ12
m-Dichlorobenzene (1,3-Dichlorobenzene)	DCBZ13
p-Dichlorobenzene (1,4-Dichlorobenzene)	DCBZ14
trans- 1,4-Dichloro-2-butene	DCBE14T
Dichlorodifluoromethane (CFC 12)	FC12
1,1 -Dichloroethane (Ethylidene chloride)	DCA11
1,2-Dichloroethane (Ethylene dichloride)	DCA12
1,1 -Dichloroethylene (1, I-Dichloroethene; Vinylidene chloride)	DCE11
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)	DCE12C
trans- 1,2-Dichloroethylene (trans- 1,2-Dichloroethene)	DCE12T
1,2-Dichloropropane (Propylene dichloride)	DCPA12
1,3-Dichloropropane (Trimethylene dichloride)	DCPA13
2,2-Dichloropropane (Isopropylidene chloride)	DCPA22
1,1 -Dichloropropene	DCP11
Cis- 1,3-Dichloropropene	DCP13C
Trans- 1,3-Dichloropropene	DCP13T

Di-isopropylether (DIPE)	DIPE
Ethanol	ETHANOL
Ethyltertiary butyl ether	ETBE
Ethylbenzene	EBZ
Ethyl methacrylate	EMETHACRY
Hexachlorobutadiene	HCBU
2-Hexanone (Methyl butyl ketone)	HXO2
Isobutyl alcohol	ISOBTOH
Methacrylonitrile	METHACRN
Methyl bromide (Bromomethane)	BRME
Methyl chloride (Chloromethane)	CLME
Methyl ethyl ketone (MEK; 2-Butanone)	MEK
Methyl iodide (Iodomethane)	IME
Methyl t-butyl ether	MTBE
Methyl methacrylate	MMTHACRY
4-Methyl-2-pentanone (Methyl isobutyl ketone)	MIBK
Methylene bromide (Dibromomethane)	DBMA
Methylene chloride (Dichloromethane)	DCMA
Naphthalene	NAPH
Propionitrile (Ethyl cyanide)	PACN
Styrene	STY
Tertiary amyl methyl ether	TAME
Tertiary butyl alcohol	TBA
1,1,1,2-Tetrachloroethane	TC1112
1,1,2,2-Tetrachloroethane	PCA
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene; PCE)	PCE
Toluene	BZME
1,2,4-Trichlorobenzene	TCB124
1,1,1 -Trichloroethane (Methylchloroform)	TCA111
1,1,2-Trichloroethane	TCA112
Trichloroethylene (Trichloroethene; TCE)	TCE
Trichlorofluoromethane (CFC- 11)	FC11
1,2,3-Trichloropropane	TCPR123
Vinyl acetate	VA
Vinyl chloride (Chloroethene)	VC
Xylene (total)	XYLENES

Semi-Volatile Organic Compounds

USEPA Method 8270C or D (base, neutral, & acid extractables)

Acenaphthene	ACNP
Acenaphthylene	ACNPY

Acetophenone	ACPHN
2-Acetylaminofluorene (2-AAF)	ACAMFL2
Aldrin	ALDRIN
4-Aminobiphenyl	AMINOBP4
Anthracene	ANTH
Benzo[a]anthracene (Benzanthracene)	BZAA
Benzo[b]fluoranthene	BZBF
Benzo[k]fluoranthene	BZKF
Benzo[g,h,i]perylene	BZGHIP
Benzo[a]pyrene	BZAP
Benzyl alcohol	BZLAL
Bis(2-ethylhexyl) phthalate	BIS2EHP
alpha-BHC	BHCALPHA
beta-BHC	BHCBETA
delta-BHC	BHCDELTA
gamma-BHC (Lindane)	BHCGAMMA
Bis(2-chloroethoxy)methane	BECEM
Bis(2-chloroethyl) ether (Dichloroethyl ether)	BIS2CEE
Bis(2-chloro-1-methylethyl) ether (Bis(2-chloroisopropyl) ether; DCIP)	BIS2CIE
4-Bromophenyl phenyl ether	BPPE4
Butyl benzyl phthalate (Benzyl butyl phthalate)	BBP
Chlordane	CHLORDANE
p-Chloroaniline	CLANIL4
Chlorobenzilate	CLBZLATE
p-Chloro-m-cresol (4-Chloro-3-methylphenol)	C4M3PH
2-Chloronaphthalene	CNPH2
2-Chlorophenol	CLPH2
4-Chlorophenyl phenyl ether	CPPE4
Chrysene	CHRYSENE
o-Cresol (2-methylphenol)	MEPH2
m-Cresol (3-methylphenol)	MEPH3
p-Cresol (4-methylphenol)	MEPH4
4,4'-DDD	DDD44
4,4'-DDE	DDE44
4,4'-DDT	DDT44
Diallate	DIALLATE
Dibenz[a,h]anthracene	DBAHA
Dibenzofuran	DBF
Di-n-butyl phthalate	DNBP
3,3'-Dichlorobenzidine	DBZD33
2,4-Dichlorophenol	DCP24

2,6-Dichlorophenol	DCP26
Dieldrin	DIELDRIN
Diethyl phthalate	DEPH
p-(Dimethylamino)azobenzene	PDMAABZ
7,12-Dimethylbenz[a]anthracene	DMBZA712
3,3'-Dimethylbenzidine	DMBZD33
2,4-Dimethylphenol (m-Xylenol)	DMP24
Dimethyl phthalate	DMPH
m-Dinitrobenzene	DNB13
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)	DN46M
2,4-Dinitrophenol	DNP24
2,4-Dinitrotoluene	DNT24
2,6-Dinitrotoluene	DNT26
Di-n-octyl phthalate	DNOP
Diphenylamine	DPA
Endosulfan I	ENDOSULFANA
Endosulfan II	ENDOSULFANB
Endosulfan sulfate	ENDOSULFANS
Endrin	ENDRIN
Endrin aldehyde	ENDRINALD
Ethyl methanesulfonate	EMSULFN
Famphur	FAMPHUR
Fluoranthene	FLA
Fluorene	FL
Heptachlor	HEPTACHLOR
Heptachlor epoxide	HEPT-EPOX
Hexachlorobenzene	HCLBZ
Hexachlorocyclopentadiene	HCCP
Hexachloroethane	HCLEA
Hexachloropropene	HCPR
Indeno(1,2,3-c,d)pyrene	INP123
Isodrin	ISODRIN
Isophorone	ISOP
Isosafrole	ISOSAFR
Kepone	KEP
Methapyrilene	MTPYRLN
Methoxychlor	MTXYCL
3-Methylcholanthrene	MECHLAN3
Methyl methanesulfonate	MMSULFN
2-Methylnaphthalene	MTNPH2
1,4-Naphthoquinone	NAPHQ14
1-Naphthylamine	AMINONAPH1

TABLE V
5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS
Continued

2-Naphthylamine	AMINONAPH2
o-Nitroaniline (2-Nitroaniline)	NO2ANIL2
m-Nitroaniline (3-Nitroaniline)	NO2ANIL3
p-Nitroaniline (4-Nitroaniline)	NO2ANIL4
Nitrobenzene	NO2BZ
o-Nitrophenol (2-Nitrophenol)	NTPH2
p-Nitrophenol (4-Nitrophenol)	NTPH4
N-Nitrosodi-n-butylamine (Di-n-butylnitrosamine)	NNSBU
N-Nitrosodiethylamine (Diethylnitrosamine)	NNSE
N-Nitrosodimethylamine (Dimethylnitrosamine)	NNSM
N-Nitrosodiphenylamine (Diphenylnitrosamine)	NNSPH
N-Nitrosodipropylamine (N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine)	NNSPR
N-Nitrosomethylethylamine (Methylethylnitrosamine)	NNSME
N-Nitrosopiperidine	NNSPPRD
N-Nitrosopyrrolidine	NNSPYRL
5-Nitro-o-toluidine	TLDNONT5
Pentachlorobenzene	PECLBZ
Pentachloronitrobenzene (PCNB)	PECLNO2BZ
Pentachlorophenol	PCP
Phenacetin	PHNACTN
Phenanthrene	PHAN
Phenol	PHENOL
p-Phenylenediamine	ANLNAM4
Polychlorinated biphenyls (PCBs; Aroclors)	PCBS
Pronamide	PRONAMD
Pyrene	PYR
Safrole	SAFROLE
1,2,4,5-Tetrachlorobenzene	C4BZ1245
2,3,4,6-Tetrachlorophenol	TCP2346
o-Toluidine	TLDNO
Toxaphene	TOXAP
2,4,5-Trichlorophenol	TCP245
0,0,0-Triethyl phosphorothioate	TEPTH
sym-Trinitrobenzene	TNB135

Chlorophenoxy Herbicides:

USEPA Method 8151A

Constituent

2,4-D (2,4-Dichlorophenoxyacetic acid)
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)

Geotracker Code

24D
DINOSEB
SILVEX
245T

Organophosphorus Compounds:

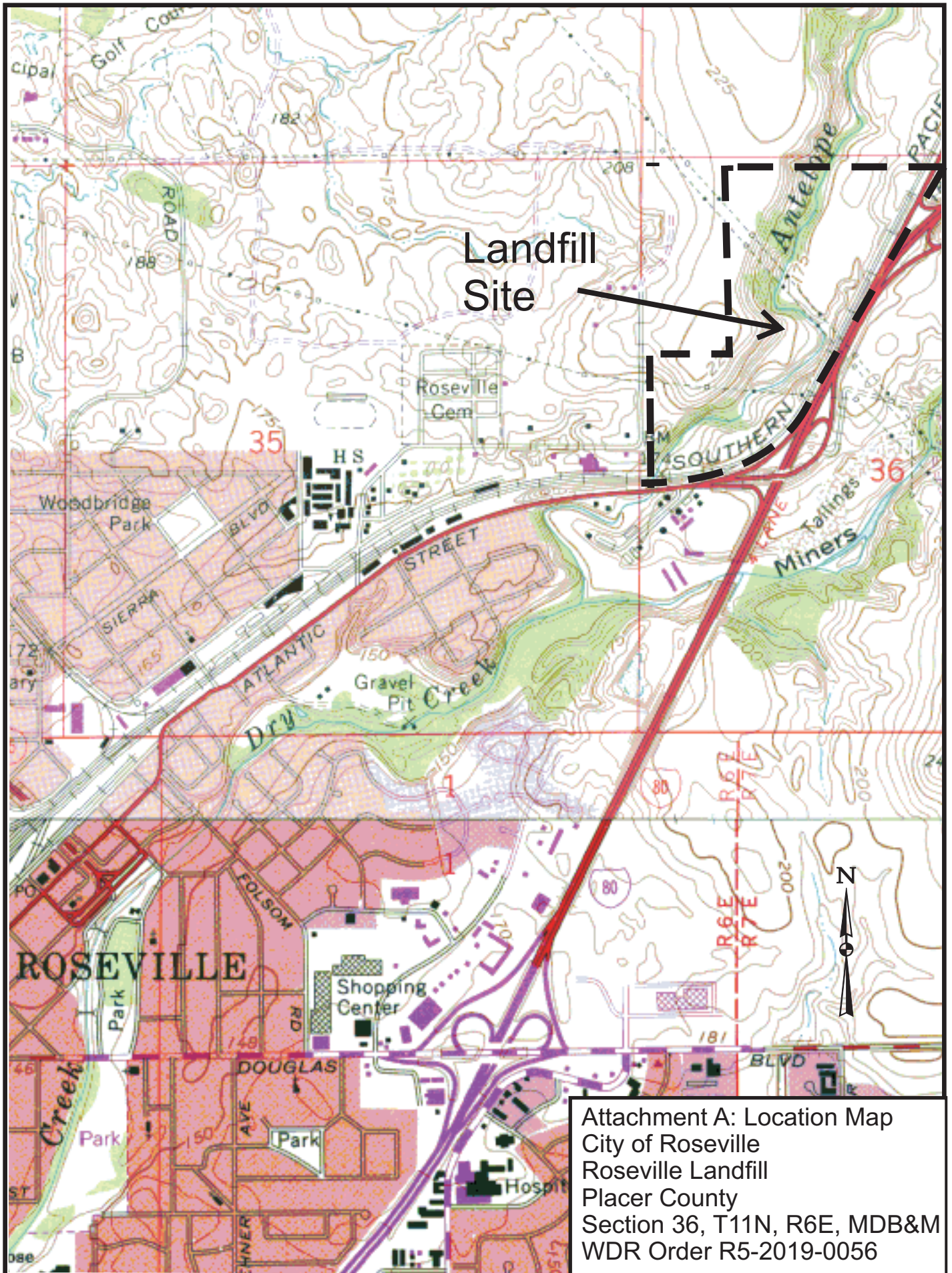
USEPA Method 8141B

Constituent

Atrazine
Chlorpyrifos
0,0-Diethyl 0-2-pyrazinyl phosphorothioate (Thionazin)
Diazinon
Dimethoate
Disulfoton
Methyl parathion (Parathion methyl)
Parathion
Phorate
Simazine

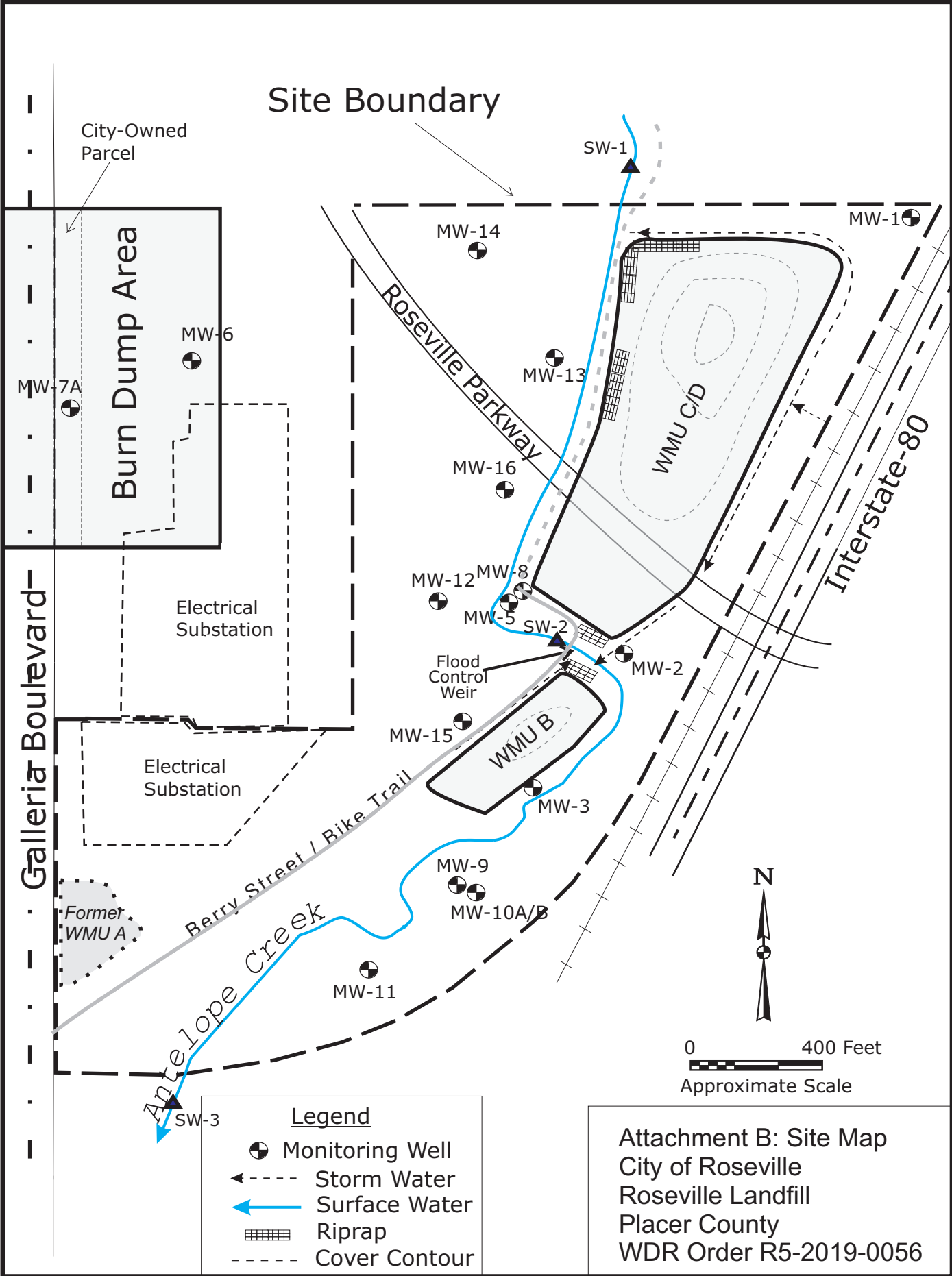
Geotracker Code

ATRAZINE
CLPYRIFOS
ZINOPHOS
DIAZ
DIMETHAT
DISUL
PARAM
PARAE
PHORATE
SIMAZINE

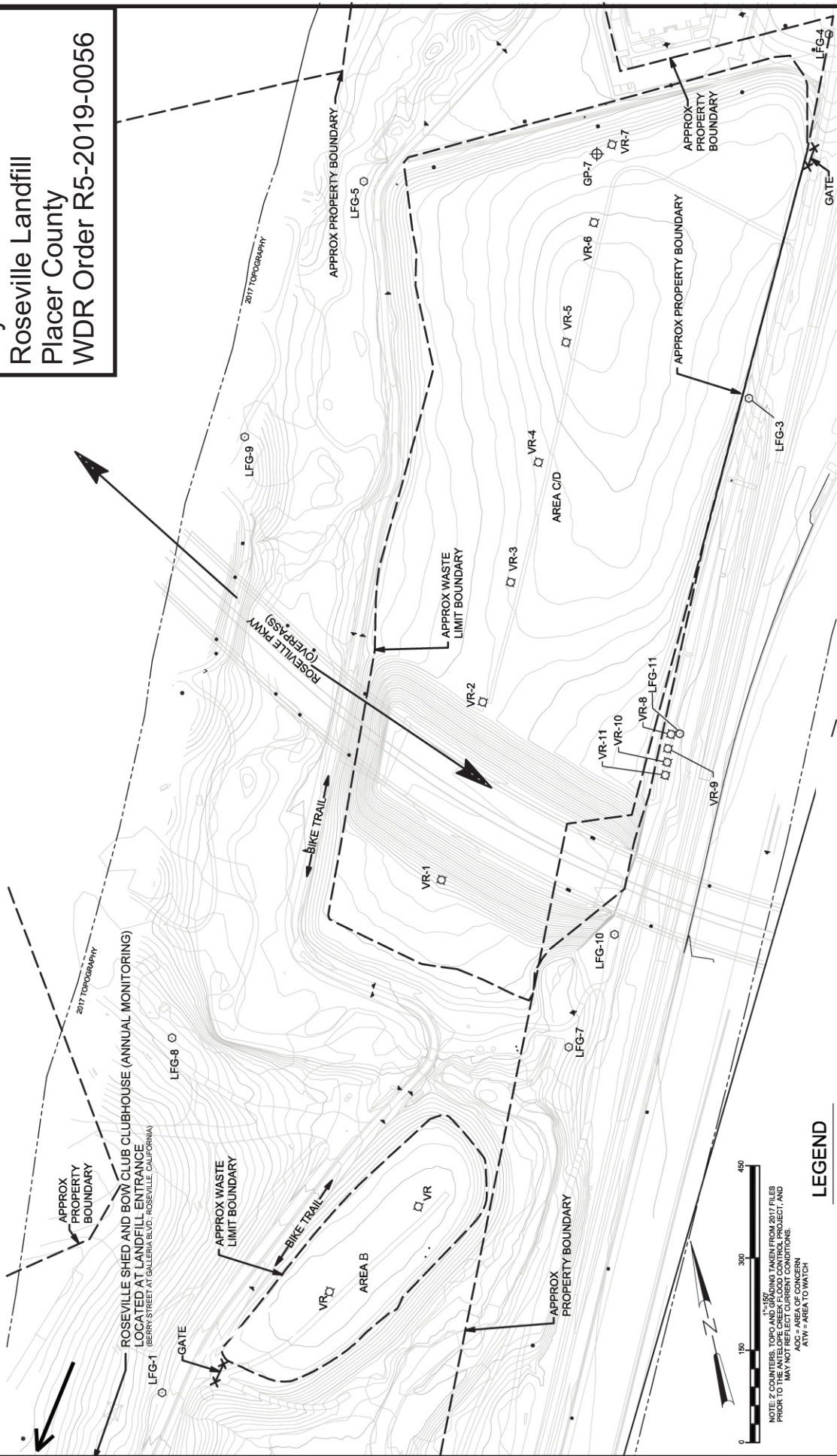


Landfill
Site

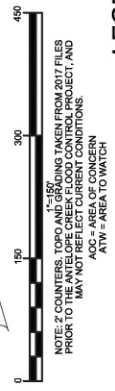
Attachment A: Location Map
City of Roseville
Roseville Landfill
Placer County
Section 36, T11N, R6E, MDB&M
WDR Order R5-2019-0056



**Attachment C: Gas Controls
and Monitoring
City of Roseville
Roseville Landfill
Placer County
WDR Order R5-2019-0056**



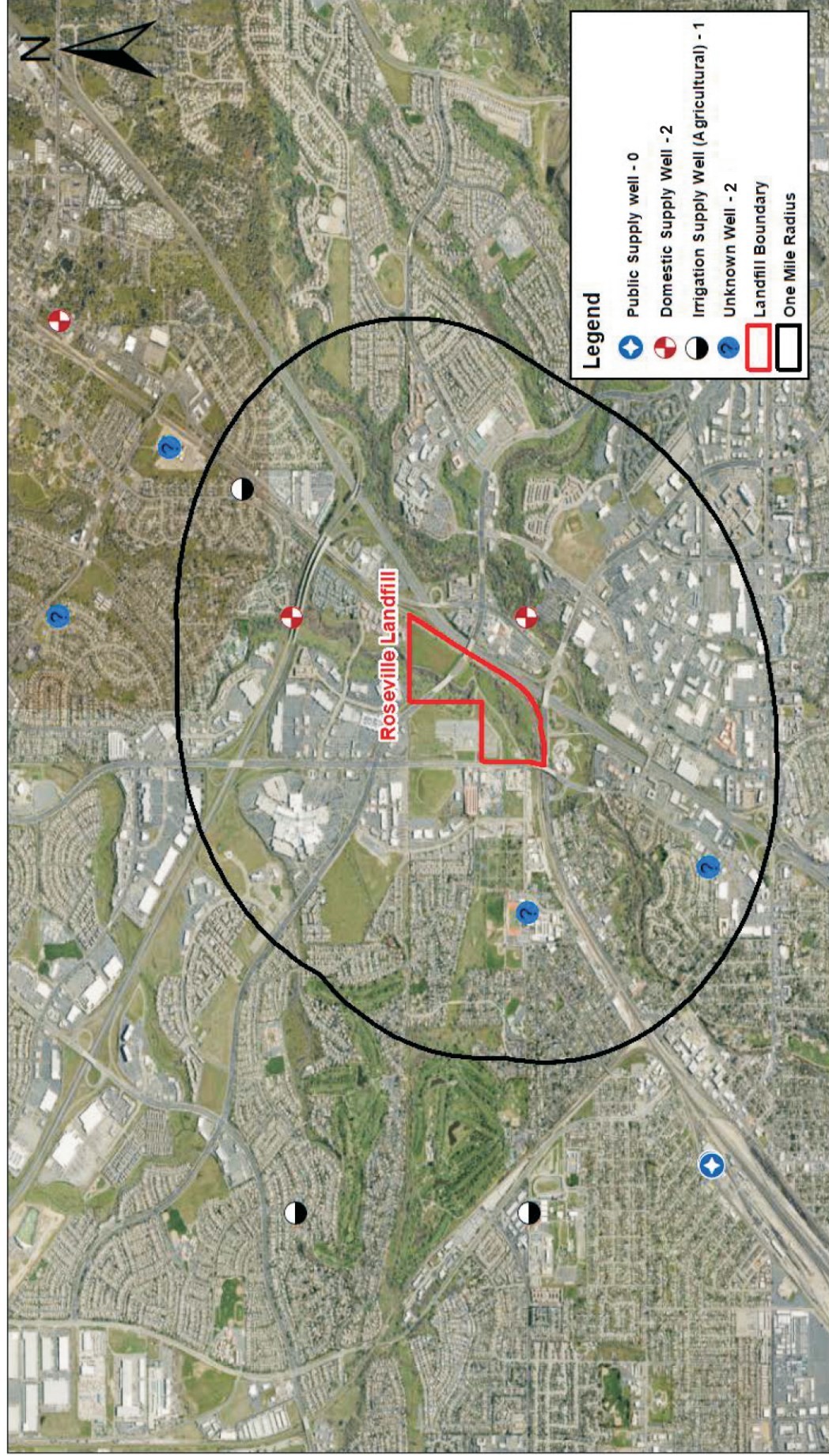
ROSEVILLE SHED AND BOM CLUBHOUSE (ANNUAL MONITORING)
LOCATED AT LANDFILL ENTRANCE
(REFERTO THEE AT GALEN RD. ROSEVILLE, CALIFORNIA)



NOTE: 2 COUNTERS, TOPO AND GRADING TAKEN FROM 2017 FILES
PRIOR TO THE ANTI-SLOPE CREEK FLOOD CONTROL PROJECT, AND
MAY NOT BE ACCURATE.
AOC = AREA OF CONCERN
ATW = AREA TO WATCH

LEGEND

- LFG - PERMANENT GAS MONITORING PROBE (SEMI-ANNUAL MONITORING)
- VR - VENT RISER (NOT PART OF THE MONITORING PROGRAM)
- ⊕ GP - TEMPORARY LANDFILL GAS PROBE (SEMI-ANNUAL MONITORING)



NEARBY WATER SUPPLY WELLS
CITY OF ROSEVILLE
ROSEVILLE LANDFILL
PLACER COUNTY

DRAWING REFERENCE
N/A

Groundwater Monitoring Summary

Table I.A: WMU C/D VOCs				
Constituent ¹	Average Concentration ¹			
	2000-2004	2005-2009	2010-2014	2015-2018
VOCs ⁴	µg/L	µg/L	µg/L	µg/L
Benzene	0.62	< 0.5	ND	ND
Chlorobenzene	5.9	2.3	ND	ND
1,2-Dichlorobenzene	1.5	0.53	ND	ND
1,4-Dichlorobenzene	7.0	3.0	0.8 ¹	ND
1,1-Dichloroethane	0.75	0.37	ND	ND
cis-1,2-Dichloroethene	3.2	1.3	0.8 ²	ND
1,2-Dichloroethane	1.0	0.5	ND	ND
Dichlorodifluoromethane	< 0.5	0.5	3.7 ²	ND
tert-Butyl alcohol	11.0	6.3	4.4 ³	8.0 ²
Tetrachloroethene	< 0.5	< 0.5	1.7 ²	1.2 ²
Trichloroethene	---	---	1.7 ²	1.2 ²
Vinyl Chloride	10.3	5.6	1.6 ²	1.6 ²

1. Based on historical monitoring data from monitoring well MW-8, except where footnoted.
2. Based on historical monitoring data from monitoring well MW-12.
3. Based on historical monitoring data from monitoring well MW-13.
4. Listing excludes various sporadically detected VOCs.

Table I.B: WMU C/D General Minerals					
Constituent ¹	Average Concentration ¹				
	Background	2000-2004	2005-2009	2010-2014	2015-2018
Alkalinity, Total	72 ²	339	308	288	271
Chloride	32 ²	120	85	72	57
Total Dissolved Solids	235 ²	580	525	454	432

1. Based on historical monitoring data from well MW-13, except where otherwise footnoted.
2. Based on historical monitoring data from monitoring well MW-2.

Table I.C: WMU C/D Dissolved Inorganics				
Constituent ¹	Average Concentration			
	Background ¹	2005-2009 ²	2010-2014 ²	2015-2018 ²
Inorganics	µg/L	µg/L	µg/L	µg/L
Arsenic	1.0	2.4	2.2	2.7
Barium	65	620	---	---
Iron	18	337	205	289
Manganese ¹	1.6	926	162	722

1. Based on historical monitoring data from monitoring well MW-1.
2. Based on historical monitoring data from monitoring well MW-8.
3. Insufficient data for representative average.

Groundwater Monitoring Summary (Con't)

Table II.A – WMU B General Minerals					
<u>Constituent¹</u>	<u>Average Concentration¹</u>				
	<u>Background</u>	<u>2000-2004</u>	<u>2005-2009</u>	<u>2010-2014</u>	<u>2015-2018</u>
Alkalinity, Total	253 ²	---	445	480	447
Chloride	26 ²	---	42	44	37
Total Dissolved Solids	372 ²	---	619	646	631

1. Based on historical monitoring data from well MW-15, except where otherwise footnoted.
2. Based on historical monitoring data from monitoring well MW-3.

Table II.B – WMU B General Minerals				
<u>Constituent¹</u>	<u>Average Concentration</u>			
	<u>Background¹</u>	<u>2005-2009²</u>	<u>2010-2014²</u>	<u>2015-2018²</u>
Inorganics	µg/L	µg/L	µg/L	µg/L
Arsenic	3.0	1.4	1.9	1.3
Barium	124	142	160	---
Iron	41	---	14	---
Manganese ¹	273	76	221	306

3. Based on historical monitoring data from monitoring well MW-3.
4. Based on historical monitoring data from monitoring well MW-15.
5. Insufficient data for representative average.

INFORMATION SHEET

ORDER NO. R5-2019-0056
CITY OF ROSEVILLE
ROSEVILLE LANDFILL
CLASS III LANDFILLS
POST-CLOSURE MAINTENANCE AND CORRECTIVE ACTION
PLACER COUNTY

The Roseville Landfill is a 115-acre landfill facility located at 998 Berry Street east of Galleria Boulevard about one-mile northeast of the city center. The facility operated from 1967 to 1979 accepting primarily household and commercial wastes. The facility includes three landfill units referred to as WMUs B, C and D. Another landfill unit formerly operated at the site, WMU A, was clean closed in 1994. The City also historically operated an 11-acre household waste burn dump immediately north of the site in the 1940s. A small (1.2-acre) portion of the former burn dump is on City-owned land and was regulated under previous WDRs (e.g., monitoring, postclosure maintenance). The remainder of the burn dump is on land owned by PG&E. Given its physical separation from the Roseville Landfill site and other factors (age, divided ownership, and nature of historical operations), the burn dump (including the portion regulated under previous WDRs) is not regulated under this Order.

Prior to 1994, all landfill units at the Facility were existing “closed, abandoned, or inactive” (CAI) units under former Chapter 15 regulations because they stopped accepting wastes prior to 27 November 1984. In 1994, WMUs B, C, and D were reclassified as Class III landfill units under previous WDR Order 94-015 per Title 27, section 20080(d). These WDRs maintain the Class III classification for these units. All three units were closed in December 1995 with Title 27 prescriptive clay soil covers. Also, WMUs C and D were closed with a contiguous cover and thereafter referred to as “WMU C/D”, a single closure unit.

WMUs B and C/D are immediately underlain by the Riverbank Formation consisting of unconsolidated sand, gravel, and silt with minor clay. Underlying the Riverbank Formation at the site is the Mehrten Formation, which consists of interbedded tuff breccia and andesitic sand.¹ The Mehrten Formation has a maximum thickness of 200 feet at the site. The depth to groundwater ranges from seven to 125 feet site-wide. Shallow groundwater generally flows to the west-northwest with seasonal gradients ranging from about 0.040 ft/ft in the wet season to 0.036 ft/ft in the dry season.

A 1988 Solid Waste Assessment Test (SWAT) investigation found volatile organic compounds (VOCs) and elevated concentrations of inorganic constituents, including general minerals and certain dissolved metals, in the groundwater at the site. Subsequent evaluation monitoring showed chloroethane up to 110 µg/L, chloroform up to 17 µg/L, dichlorodifluoromethane up to 92 µg/L, tetrachloroethylene up to 24 µg/L, trichloroethylene up to 10 µg/L, trichlorofluoromethane up to 24 µg/L, vinyl chloride up to 99 µg/L and other chlorinated VOCs. Slightly elevated concentrations of general minerals, primarily total dissolved solids (TDS) and total alkalinity, have also historically been detected in groundwater monitoring wells immediately down gradient of the landfill units.

1. Former WMU A and the offsite burn dump are directly underlain by the Mehrten Formation.

There are currently 14 monitoring wells at the site (MWs-1, 2, 3, 5, 8, 9, 10A, 10B, and 11 through 16), including two wells down gradient of WMU B (MWs-12 and 15) and five wells down gradient of WMU C/D (MWs-5, 8, 13, 14 and 16). Several of the monitoring wells at the site are screened in the underlying Mehrten Formation to maximum depths of 125 feet bgs on the western side of the site. See WDR Attachment B: Site Map. There are also two wells immediately north of the site (MWs-6 and 7a) used to monitor the burn dump area under previous WDRs. Continued monitoring of these wells is considered voluntary under these WDRs, but the results may be reported under the MRP of this Order. See MRP section A.1.a.

In 1995, the Discharger implemented landfill closure and passive LFG controls as corrective action measures to address groundwater impacts and LFG exceedances at the site. Both Areas B and C/D were closed with Title 27 prescriptive clay soil covers and appropriate drainage controls. Passive landfill gas vents with wind-drive turbines were also installed along the deck centerlines of the two units and several gas monitoring probes installed along the perimeter of the units per Title 27 solid waste regulations. In 2003, additional gas vents were installed along the southeastern perimeter of Area C/D. Historical monitoring data for the landfill units collected since the year 2000 indicates that concentrations of most of the VOCs detected in groundwater have declined to non-detect levels.

These revised WDRs prescribed requirements for ongoing postclosure maintenance and corrective action monitoring of the landfill, including submission of relevant updated reports (i.e., Monitoring Data Analysis Methods Report and Water Quality Protection Standard Report). An updated Postclosure Maintenance Plan (PMP) is also required to be submitted, including updated financial assurance cost estimates for postclosure maintenance and corrective action. Financial assurance demonstrations are required to be submitted to the Central Valley Water Board on 1 June of each year beginning in the year 2020.

Surface drainage is to Antelope Creek, which meanders from northeast to southwest through the site near the landfill units. Downstream of the site it joins Dry Creek, tributary to the Natomas East Main Drain, and the Sacramento River.

JDM

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
FOR
WASTE DISCHARGE REQUIREMENTS
FOR
NONHAZARDOUS SOLID WASTE DISCHARGES
REGULATED BY SUBTITLE D AND/OR TITLE 27
(40 C.F.R. section 258 and Title 27, § 20005 et seq.)

December 2015

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A. APPLICABILITY

1. These Standard Provisions and Reporting Requirements (SPRRs) are applicable to nonhazardous solid waste disposal sites 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., and municipal solid waste (MSW) landfills that are subject to the Federal Subtitle D regulations contained in 40 Code of Federal Regulations section 258 (hereafter, "Subtitle D" or "40 C.F.R. § 258.XX") in accordance with State Water Resources Control Board (State Water Board) Resolution 93-62. The Subtitle D regulations are only applicable to MSW landfills and therefore any requirements in these SPRRs that are referenced as coming from Subtitle D are not applicable to non-MSW waste management units such as Class II surface impoundments, Class II waste piles, and non-MSW landfill units. All Subtitle D requirements in these SPRRs are referenced with "[40 C.F.R. § 258.XX]" after the requirement.
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 landfill 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 liquid or semi-solid waste (waste containing less than 50 percent solids) is prohibited, except for the following when proposed in the ROWD/JTD and approved by this Order:
 - a. Dewatered sewage or water treatment sludge as described in Title 27, section 20220(c) provided it is discharged above a composite liner with a leachate collection and removal system (LCRS) [Title 27, § 20200(d)(3)].
 - b. Leachate and/or landfill gas condensate that is returned to the composite-lined waste management unit (with an LCRS) from which it came [Title 27, § 20340(g) and 40 C.F.R. § 258.28].
2. 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)].

3. The discharge of wastes outside of a waste management unit or portions of a unit specifically designed for their containment is prohibited.
4. The discharge of solid waste containing free liquid or which may contain liquid in excess of the moisture holding capacity as a result of waste management operations, compaction or settlement is prohibited.
5. The discharge of waste to a closed landfill unit is prohibited.
6. The discharge of waste constituents to the unsaturated zone or to groundwater is prohibited.
7. 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 and landfill gas condensate 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. The discharge of leachate or landfill gas condensate is restricted to those portions of a waste management unit that has a composite liner system and LCRS meeting the Federal Subtitle D requirements [40 C.F.R. § 258.28].
4. Leachate and condensate returned to a composite-lined landfill unit (when approved by this Order) shall be discharged and managed such that it does not cause instability of the waste, does not cause leachate seeps, does not generate additional landfill gas that is not extracted from the landfill by an active landfill gas extraction system, does not cause contaminants to enter surface water runoff, and does not cause leachate volumes to exceed the maximum capacity of the LCRS.
5. Any discharge of waste outside the portion of the landfill that was already covered with waste as of the landfill unit's respective Federal Deadline constitutes a "lateral expansion" and requires the installation of an approved composite liner system and LCRS [40 C.F.R. § 258.40(b)].

6. Wastes shall be discharged only into waste management units specifically designed for their containment and/or treatment, as described in this Order.
7. The discharge shall remain within the designated disposal area at all times.
8. 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. Interim cover is daily and intermediate cover [Title 27, § 20750(a)]. Interim cover over wastes discharged to a landfill shall be designed and constructed to minimize percolation of liquids through the wastes [Title 27, § 20705(b)].
4. Intermediate cover consisting of compacted earthen material of at least twelve (12) inches shall be placed on all surfaces of the fill where no additional solid waste will be deposited within **180 days** [Title 27, § 20700(a)].
5. During wet weather conditions, the facility shall be operated and graded to minimize leachate generation.
6. 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)].
7. 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.
8. The Discharger shall limit water used for facility maintenance within landfill areas to the minimum amount necessary for dust control and construction.
9. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.

10. 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.
11. The Discharger shall ensure that methane and other landfill gases are adequately vented, removed from landfill units, or otherwise controlled to prevent the danger of adverse health effects, nuisance conditions, degradation, or the impairment of the beneficial uses of surface water or groundwater due to migration through the unsaturated zone.
12. The Discharger shall maintain the depth of the fluid in the sump of each landfill 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).
13. The depth of fluid on the landfill liner shall not exceed **30 centimeters** (cm) [40 C.F.R. § 258.40(a)(2)]. This regulation is interpreted by the Central Valley Water Board to exclude the leachate sump. The Discharger shall **immediately** notify the Central Valley Water Board staff by telephone, and follow up in writing within **seven** days if monitoring reveals that the depth of fluid on any portion of the liner (excluding the sump) exceeds 30 cm (approximately 12 inches). The written notification shall include a timetable for remedial or corrective action necessary to achieve compliance with the leachate depth limitation.
14. 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)].
15. 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 (Industrial General Permit) or most recent general industrial storm water permit), or retain all storm water on-site.
16. Internal site drainage from surface or subsurface sources shall not contact or percolate through wastes.
17. New MSW landfill units or lateral expansions of existing units shall not be sited in a "wetland" [as defined in 40 C.F.R. § 232.29(r)] unless there is no practical alternative; steps have been taken to assure no net loss of wetland; the landfill unit will not degrade the wetland; the unit will not jeopardize threatened or endangered species or produce adverse modification of a critical habitat or violate any requirement of the Marine Protection, Research, and Sanctuaries Act of 1972 [40 C.F.R. § 258.12].

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 landfill modules that include the following:
 - a. Detailed construction drawings showing all required liner system components, the LCRS, leachate sump, unsaturated zone monitoring system, any proposed landfill gas monitoring and extraction points, 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 module (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, section 21760(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 III units for a 100-year, 24-hour storm event, and 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 III landfill units shall be designed to withstand the maximum probable earthquake and 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, or gas [Title 27, § 20370(a)].
9. The Discharger shall perform stability analyses that include components to demonstrate the integrity of the landfill foundation, final slopes, and containment systems under both static and dynamic conditions throughout the landfill's life including the closure period and post-closure maintenance period [Title 27, § 21750(f)(5)].
10. New waste management units and expansions of existing units shall not be located on a known Holocene fault [Title 27, § 20260(d)].
11. Liners shall be designed and constructed to contain the fluid, including landfill gas, 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 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. Performance requirements for geosynthetic membranes shall include, but are not limited to, a need to limit infiltration of water, to the greatest extent possible; a need to control landfill gas emissions; mechanical compatibility with stresses caused by equipment traffic, and for final covers the result of differential settlement over time and durability throughout the post-closure maintenance period [Title 27, § 20324(i)(1)].
16. 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.
17. The Discharger shall propose an electronic leak location survey of the top liner for any new landfill module in the construction quality assurance plan unless the Discharger demonstrates that a leak location survey is not needed.
18. Leachate collection and removal systems are required for Class II landfills and surface impoundments, MSW landfills, and for Class III landfills which have a liner or which accept sewage or water treatment sludge [Title 27, § 20340(a)].
19. All new landfill units or lateral expansions of existing units that require a LCRS shall have a blanket-type LCRS that covers the bottom of the unit and extends as far up the sides as possible. The LCRS shall be of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and by any equipment used at the unit [Title 27, § 20340(e)].
20. 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)].
21. Leachate collection and removal systems shall be designed and operated to function without clogging through the scheduled closure of the landfill unit and during the post-closure maintenance period.
22. The LCRS shall be designed to maintain the depth of fluid over any portion of the LCRS of no greater than 30 cm [40 C.F.R. § 258.40(a)(2)], excluding the leachate sump. 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)].

23. 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].
24. 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)].
25. 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.
26. The Discharger shall notify Central Valley Water Board staff at least **14 days** prior to commencing field construction activities including construction of a new lined cell or module, construction of a final cover, or any other construction that requires Central Valley Water Board staff approval under this Order.
27. 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 lined landfill module. 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.
28. 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.
29. Prior to placement of waste in a new landfill unit, the Discharger shall monitor any pan lysimeter for the unit that has received enough rainfall to flood the LCRS sump. If liquid is detected in the pan lysimeter, the Discharger shall verify that the liquid is not from a leak in the primary liner system before waste can be accepted to the new module.

G. STANDARD CLOSURE AND POST-CLOSURE SPECIFICATIONS

1. The Discharger shall submit a final or partial final closure and post-closure maintenance plan at least **two years** prior to the anticipated date of closure [Title 27, § 21780(d)(1)].

2. The Discharger shall notify the Central Valley Water Board in writing that a landfill unit or portion of a unit is to be closed either at the same time that the California Department of Resources Recycling and Recovery (CalRecycle) is notified or **180 days** prior to beginning any final closure activities, whichever is sooner [Title 27, § 21710(c)(5)(A)]. The notice shall include a statement that all closure activities will conform to the most recently approved final or partial final closure plan and that the plan provides for site closure in compliance with all applicable federal and state regulations [Title 27, § 21710(c)(5)(C)].
3. Initiation of closure activities shall begin within **30 days** of final waste receipt, or within **one year** of receipt of most recent waste if additional capacity remains [40 C.F.R. § 258.60(f)].
4. Closure activities shall be completed within **180 days** of the beginning of closure activities unless an extension is granted by the Executive Officer [40 C.F.R. § 258.60(g)].
5. The Discharger shall carry out both mandatory closure and normal closure of a waste management unit or a portion of a unit in accordance with a closure and post-closure maintenance plan approved by the Central Valley Water Board [Title 27, § 20950(a)(1)] through the issuance of closure waste discharge requirements.
6. The Discharger shall notify the Central Valley Water Board that a preliminary closure and post-closure maintenance plan has been prepared and placed in the operating record by the date of initial receipt of waste at any new MSW landfill unit or lateral expansion of any existing unit [40 C.F.R. § 258.60(d)]. This notification shall be included in the cover letter transmitting the preliminary closure and post-closure maintenance plan.
7. In addition to the applicable provisions of Title 27, the preliminary closure and/or the post-closure maintenance plans for MSW landfill units shall include the following:
 - a. A description of the steps necessary to close all MSW landfill units at any point during their active life in accordance with the cover design requirements [40 C.F.R. § 258.60(c)];
 - b. An estimate of the largest area of the landfill unit(s) ever requiring a final cover at any time during the active life of the unit(s) [40 C.F.R. § 258.60(c)(2)];
 - c. An estimate of the maximum inventory of wastes ever on-site over the active life of the waste management facility [40 C.F.R. § 258.60(c)(3)]; and
 - d. A schedule for completing all activities necessary to satisfy the closure criteria in 40 C.F.R. section 258.60 [40 C.F.R. § 258.60(c)(4)].

8. 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, federal requirements for a MSW facility, land use of the closed unit, and a construction quality assurance plan [Title 27, § 21769(c) & (d)].
9. 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)].
10. The final cover of closed landfills shall be designed, graded, and maintained to prevent ponding and soil erosion due to high run-off velocities [Title 27, § 21090(b)(1)(A)].
11. The final grading design shall be designed and approved by a registered civil engineer or certified engineering geologist [Title 27, § 21090(b)(1)(C)].
12. All final cover designs shall include a minimum 1-foot thick erosion resistant layer [Title 27, § 21090(a)(3)(A)].
13. The Discharger shall close the landfill with minimum 15-foot wide benches every 50 vertical feet [Title 27, § 21090(a)].
14. Final cover slopes shall not be steeper than a horizontal to vertical ratio of one and three quarters to one and designs having any slopes steeper than a horizontal to vertical ratio of three to one, or having a geosynthetic component, shall have these aspects of their design specifically supported in the slope stability report required in Title 27, section 21750(f)(5) [Title 27, § 21090(a)].
15. For any portions of the final cover installed after July 18, 1997, for which the Central Valley Water Board has not approved a slope and foundation stability report on or before that date, the Discharger shall meet the requirements of Title 27, section 21750(f)(5) [Title 27, § 21090(a)(6)].
16. 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)].
17. The Discharger shall design storm water conveyance systems for closed Class III units for a 100-year, 24-hour storm event, and shall design storm water conveyance systems for closed Class II units for a 1,000-year, 24-hour storm event [Title 27, § 21750(e)(3)].
18. Closed landfill units shall be provided with at least two permanent surveying monuments, installed by a licensed land surveyor or by a registered civil engineer, from which the location and elevation of all wastes, containment

structures, and monitoring facilities can be determined throughout the post-closure maintenance period [Title 27, § 20950(d)].

19. Following closure of any MSW landfill units, the Discharger shall notify the Executive Officer that the deed to the landfill facility property, or some other instrument that is normally examined during a title search, has been recorded and a copy placed in the operating record. The notation on the deed shall in perpetuity notify any potential purchaser of the property that the land has been used as a landfill facility and that use of the land is restricted to the planned use described in the post-closure maintenance plan [Title 27, § 20515(a)(4) and §21170, and 40 C.F.R. § 258.60(i)].
20. Construction or repair of the 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)].
21. The Discharger shall incorporate into the closure and post-closure maintenance plan a cover-integrity monitoring and maintenance program which includes at least the following: a periodic leak search, periodic identification of other problem areas, prompt cover repair, and vegetation maintenance [Title 27, § 21090(a)(4)].
22. The Discharger shall complete a final cover survey upon completion of closure activities for that portion of the landfill. The final cover surveys shall include an initial survey and map [Title 27, § 21090(e)(1). Every **five years**, the Discharger shall conduct a survey of the closed landfill cover and submit an iso-settlement map accurately depicting the estimated total change in elevation of each portion of the final cover's low-hydraulic-conductivity layer [Title 27, § 21090(e)(2)].
23. 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 closed landfill units shall be maintained in accordance with and approved post-closure maintenance plan [Title 27, § 21710(c)(6)].
24. Within **180 days** of completion of closure construction activities, the Discharger shall submit final documentation of closure, including the Certification of Closure. The closure documents shall include a final construction quality assurance report and any other documents necessary to support the certification [Title 27, § 21880].
25. The post-closure maintenance period 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)].

26. The Discharger shall conduct a periodic leak search to monitor of the integrity of the final cover in accordance with the schedule in the approved final post-closure maintenance plan [Title 27, § 21090(a)(4)(A)].
27. The Discharger shall periodically inspect and identify problems with the final cover including areas that require replanting, erosion, areas lacking free drainage, areas damaged by equipment operations, and localized areas identified in the required five-year iso-settlement survey [Title 27, § 21090(a)(4)(B)].
28. The Discharger shall repair the 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)].
29. Throughout the post-closure maintenance period, the Discharger shall maintain the structural integrity and effectiveness of all containment structures, maintain the final cover as necessary to correct the effects of settlement and other adverse factors, continue to operate the LCRS as long as leachate is generated and detected, maintain the monitoring systems, prevent erosion and related damage of the final cover due to drainage, and protect and maintain surveyed monuments [Title 27, § 21090(c)].
30. Post-closure maintenance shall be conducted for a minimum period of **30 years** or until the waste no longer poses a threat to environmental quality, whichever is greater [Title 27, § 21180(a) and Title 27, § 21900(a)].

H. STANDARD FINANCIAL ASSURANCE PROVISIONS

1. The Discharger shall establish an irrevocable fund for closure and post-closure maintenance to ensure closure and post-closure maintenance of each classified unit in accordance with an approved closure and post-closure maintenance 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), § 22221, 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) and 40 C.F.R. § 258.53(b)].

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 landfill facility 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 or soil-pore gas 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 alternant 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)]. Groundwater samples shall not be field-filtered prior to laboratory analysis [40 C.F.R. § 258.53(b)]. Groundwater samples needing filtering (e.g., samples to be analyzed for dissolved metals) shall be filtered by the laboratory prior to analysis.
19. Groundwater elevations shall be measured in each well immediately prior to purging, each time groundwater is sampled. The owner or operator shall determine the rate and direction of groundwater flow each time groundwater is sampled. Groundwater elevations in wells which monitor the same waste management area shall be measured within a period of time short enough to avoid temporal variations in groundwater flow which could preclude accurate determination of groundwater flow rate and direction [40 C.F.R. § 258.53(d)].
20. Monitoring wells, piezometers, and other measurement, sampling, and analytical devices must be operated and maintained so that they perform to design

specifications throughout the life of the monitoring program [40 C.F.R. § 258.51(c)(2)]. Monitoring devices that cannot be operated and maintained to perform to design specifications shall be replaced after review and approval of a report (i.e., work plan) for the proposed replacement devices.

21. 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)].
22. 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)].
23. The Discharger shall submit a work plan for review and approval at least **60 days** prior to installation or abandonment of groundwater monitoring wells.
24. 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.
25. 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].
26. 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].
27. 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)].
28. 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)].
29. 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.].

30. 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.].
31. 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)].
32. 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)].
33. An unsaturated zone monitoring system shall be established for each waste management unit [Title 27, § 20415(d)].
34. 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)].
35. 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)].
36. Groundwater elevation, temperature, electrical conductivity, turbidity, and pH are to be accurately measured at each well each time groundwater is sampled [Title 27, § 21415(e)(13)].
37. 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)].
38. 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)].
39. 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)].

40. 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.
41. 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.
42. 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 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”.
43. 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).

44. 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.
45. **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.46 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.47 provides the procedure for analytes that are detected in 10% or greater of the background samples such as naturally occurring constituents like chloride.
46. **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.46.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.

47. **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.47.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)(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.47.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.

48. **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.46 or I.47, 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 14 days** of confirming measurably significant evidence of a release, the Discharger shall (for releases from MSW landfill units) notify all persons who own the land or reside on the land that directly overlies any portion of the plume of contamination if contaminants have migrated off-site if indicated by sampling of detection monitoring wells [40 C.F.R. § 258.55(g)(1)(iii)].
 - c. **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)]. For releases from MSW landfill units, the Evaluation Monitoring Program shall also include any additional proposals necessary to comply with 40 C.F.R. § 258.55, particularly the additional monitoring well required by 40 C.F.R. § 258.55(g)(1)(ii).
 - d. **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)].

- e. 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)].
- f. **Within 90 days** of the date that the Evaluation Monitoring Program from paragraph J.1.c 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)].

- g. The Discharger shall (for releases from MSW landfill units) discuss the results of the updated engineering feasibility study, prior to the final selection of a remedy, in a public meeting with interested and affected parties [40 C.F.R. § 258.56(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 from gases and leachate generated by discharged waste during the active life, closure, and 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. New and existing Class III landfills shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return period [Title 27, § 20260(c)].
2. New and existing Class II landfills shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return period [Title 27, § 20250(c)].
3. The Discharger shall design storm water conveyance systems for Class III units for a 100-year, 24-hour storm event, and shall design storm water conveyance systems for Class II units for a 1,000-year, 24-hour storm event [Title 27, § 21750(e)(3)].
4. MSW landfills located in a 100-year floodplain shall demonstrate that the landfill unit will not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste so as to pose a hazard to human health or the environment [40 C.F.R. § 258.11(a)].
5. 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)].

6. Precipitation on landfills or 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)].
7. 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;
 - 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; and
 - 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.
8. 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)].

9. Surface and subsurface drainage from outside of a waste management unit shall be diverted from the unit [Title 27, § 20365(e)].
10. 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)].
11. Any drainage layer in the 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)].