

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2015-0058

WASTE DISCHARGE REQUIREMENTS
FOR
SAN JOAQUIN COUNTY DEPARTMENT OF PUBLIC WORKS
FOOTHILL SANITARY LANDFILL, INC.
FOOTHILL LANDFILL
CLASS III LANDFILLS
CONSTRUCTION, OPERATION, CLOSURE, POST-CLOSURE
MAINTENANCE, AND CORRECTIVE ACTION
SAN JOAQUIN COUNTY

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

1. The San Joaquin County Department of Public Works (County) and Foothill Sanitary Landfill, Inc. (hereinafter jointly referred to as “Discharger”) respectively own and operate the Foothill Landfill facility in San Joaquin County. The facility is an active, municipal solid waste (MSW) landfill near Linden about 17 miles northeast of Stockton, as shown in Attachment A: Location Map (incorporated by reference under Finding 2 below). The facility is regulated under the California Water Code, section 13000 et seq.; California Code of Regulations, title 27, section 20005 et seq. (Title 27); and the Code of Federal Regulations, title 40, section 258, et seq. (40 CFR 258 or “Subtitle D”). Applicable Subtitle D regulations are implemented through State Water Resources Control Board (State Water Board) Resolution 93-62.
2. 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 – Area Map
 - c. Attachment C – Site Map
 - d. Attachment D – Storm Water Controls & Monitoring
 - e. Attachment E – Landfill Gas Controls & Monitoring
 - f. Attachment F – Conceptual Landfill Development Plan
 - g. Information Sheet
 - h. January 2012 Standard Provisions and Reporting Requirements (SPRRs)

The attachment maps show the location of items described in the WDR findings (e.g., site, landfill units, monitoring and control systems, development areas) while the Information Sheet provides additional or supplementary landfill information. The SPRRs contain non-site specific requirements common to all MSW landfills referenced, as applicable, under various WDR specifications and provisions of this order. See Finding 14.

3. The facility is on an 800-acre site in Sections 12 and 13, T2N, R9E, MDB&M, corresponding to Assessor Parcel Number 093-44-01. The geographic coordinates

of the site are Latitude 38.036° north, Longitude -120.945 ° west. The facility address is 6484 North Waverly Road, Linden, CA 95326. See Attachment B: Area Map.

4. On 17 December 2014, the Discharger submitted an amended Joint Technical Document (JTD) describing/referencing significant changes associated with the facility since adoption of previous WDRs Order R5-2003-0020 in January 2003, including, but not limited to, the following:
 - a. Issuance of Cleanup and Abatement Order R5-2004-0706 on 18 May 2004 for corrective action relating to VOC impacted groundwater underlying Landfill 1;
 - b. Implementation of a Site Improvement Program, including, but not limited to, installation of a landfill gas collection system and partial final closure of unlined Landfill 1, Module I;
 - c. Installation of gas migration monitoring wells along the site perimeter;
 - d. Monitoring data indicating the continued presence of landfill gas in the unsaturated zone and low-level VOC impacts to groundwater;
 - e. A revised Preliminary Closure and Postclosure Maintenance Plan; and
 - f. Updated financial assurances information.

These revised waste discharge requirements (WDRs) include updated findings and requirements for the facility based on information in the amended JTD and in accordance with California Code of Regulations (CCR), title 27, division 2 (Title 27) regulations. Upon adoption of these revised WDRs, and except for enforcement, WDR R5-2003-0020 no longer applies and is rescinded by this Order.

5. The landfill has been in operation since 1965, accepting household, commercial, industrial, and agricultural wastes from the Cities of Stockton, Manteca, Tracy and surrounding areas. The landfill property was previously owned by Nomellini Construction, Inc. and then Waste Management of North America, Inc. In 1991, the County acquired the property in condemnation proceedings. Foothill Sanitary Landfill, Inc. has operated the landfill since start-up.
6. The facility includes the landfill and associated controls and monitoring systems (e.g., leachate, landfill gas, surface water, groundwater); storm water retention basins; access roads; office and maintenance buildings; a scale house; pump station; a white goods processing area; and undeveloped acreage for future module expansion; all as shown in Attachment C: Site Map.
7. The landfill consists of two classified waste management units referred to as Landfill 1 (LF-1) and Landfill 2 (LF-2). LF-1, the older of the two landfills, is an 85-acre, unlined landfill unit in the central portion of the site. LF-1 consists of a single, unlined Module I that was partially-closed in 2006 and no longer accepts waste. LF-2 is a lined, expansion landfill being constructed one module at a time around LF-1. Each LF-2 module will be constructed on an as-needed basis as existing modules are filled. Development of LF-2 around LF-1 will proceed in a clockwise sequence. At projected

landfill closure in the year 2082, LF-2 will consist of 10 waste disposal modules encircling and partially overlapping LF-1. See Attachment F: Conceptual Landfill Development Plan.

8. Each new expansion landfill module will be constructed in phases with initial phases typically consisting of footprint expansion and later phases consisting of vertical development, including LF-1 (Module I) overlap (i.e., filling in between the two landfill units as vertical development proceeds). The first LF-2 module, Module 1 (M-1) is being constructed/developed immediately south of LF-1. The first phase (M-1A) was constructed in 2003 and the second phase (M-1B), consisting of partial LF-1 overlap, was constructed in 2006. The next LF-2 module, M-2, will begin construction in the spring of 2015.
9. The landfill's operations and development status may summarized as follows:

Landfill	Module	T27 Classification	Area (acres)	Containment System	Operations / Development Status
LF-1	M-I	Existing Class III	80	Unlined, no LCRS ¹	Inactive/Partially Closed
LF-2	M-1	New Class III	40	Subtitle D Composite liner system & LCRS ⁴	Active
	M-2 ³		35 ²		Pending construction
	M-3 -- M-10 ⁵		519 ²		Future development
Totals:	11 modules		674 ²		

1. LCRS – leachate collection and recovery system
2. Areas estimated for pending and future modules.
3. First M-2 phase (M-2A) scheduled for construction in spring 2015.
4. Composite liner includes 60-mil HDPE geomembrane overlying geosynthetic clay liner (GCL). LCRS includes 9-inch gravel blanket layer with perforated collection piping to assist drainage to double-lined LCRS sump.
5. Future modules to be constructed on an as-needed basis.

See also Findings 70 et seq. herein; Attachment F; and the Information Sheet attached to this Order.

10. Title 27 contains regulatory standards for discharges of solid waste promulgated by the State Water Board and the California Department of Resources Recovery and Recycling (CalRecycle). In certain instances, this Order cites CalRecycle regulatory sections. Title 27, section 20012 allows the Central Valley Water Board to cite CalRecycle regulations from Title 27 where necessary to protect water quality, provided it does not duplicate or conflict with actions taken by the Local Enforcement Agency (LEA) in charge of implementing CalRecycle's regulations.

11. On 9 October 1991, the United States Environmental Protection Agency (USEPA) promulgated MSW landfill regulations under the Resource Conservation and Recovery Act (RCRA) known as “Subtitle D” (Code of Federal Regulations, title 40, part 258). Subtitle D applies to all California unclassified, Class II and III landfills that ever accepted MSW and any waste on or after the effective date of Subtitle D (9 October 1991). Limited exceptions to the applicability of Subtitle D regulations include (but are not limited to)
 - a. MSW landfills that ceased accepting wastes prior to the federal deadline may only be required to comply with the closure/postclosure requirements in Subpart F (40 CFR 258.60); and
 - b. MSW landfills constructed prior to the federal deadline may be exempt from the design requirements in Subpart D (40 CFR 258.40).
12. *State Water Resources Control Board Resolution 93-62 (as amended on 21 July 2005, Policy for Regulation of Municipal Solid Waste (Resolution 93-62)* requires the Central Valley Water Board WDRs for MSW landfills to implement the applicable provisions of the federal MSW regulations that are necessary to protect water quality, and in particular the containment provisions and the provisions that are either more stringent or that do not exist in Title 27. See Resolution 93-62, Provision I.A. Title 27 provisions applicable to MSW landfills that are equivalent to, or more stringent than, corresponding Subtitle D regulations are not affected by Resolution 93-62.
13. LF-1’s waste footprint was established prior to the Subtitle D federal deadline, so it was not required to be retrofitted with a Subtitle D composite base liner per the exemption described in Finding 11.b above. The landfill accepted waste after the effective date of Subtitle D, however, so it is subject to all other Subtitle D requirements, as referenced in Resolution 93-62, Attachment 1. LF-2, however, is subject to all of Subtitle D regulations because it accepted waste after the effective date of Subtitle D and is still active.
14. This Order implements the applicable regulations for discharges of solid waste to land through Prohibitions, Specifications, Provisions, and monitoring and reporting requirements. Prohibitions, Specifications, and Provisions are listed in Sections A through H of these WDRs below, and in the *Standard Provisions and Reporting Requirements (SPRRs) for Nonhazardous Solid Waste Discharges Regulated by Subtitle D and/or Title 27* dated January 2012 which are part of this Order. Monitoring and reporting requirements are included in the Monitoring and Reporting Program (MRP) 2015-0058 and in the SPRRs. In general, requirements that are either in regulations or otherwise apply to all MSW landfills are considered to be “standard” and are therefore in the SPRRs. Any site-specific changes to a requirement in the SPRRs are included in the applicable section (Sections A through H) of these WDRs, and such requirement in the WDRs supersedes the requirement in the SPRRs.

WASTE CLASSIFICATION AND UNIT CLASSIFICATION

15. The landfill accepts wastes defined as “inert” and “nonhazardous” under Title 27, sections 20230 and 20220, respectively. The landfill also accepts MSW as defined in Title 27, Section 20164. The landfill does not accept (and is not authorized to accept) hazardous or designated wastes, which are diverted from the landfill under the facility’s waste exclusion program. Recyclable wastes are generally diverted from the landfill at offsite transfer stations.
16. The landfill is also not authorized to accept liquid or semi-solid wastes, except for leachate and landfill gas condensate generated from and returned to LF-2 (see Findings 63 and 64); nonhazardous de-watered sewage/septage sludge discharged in accordance with Title 27, sections 20200(d) and 20220(c); and certain inert wastes. The landfill does not currently accept sewage/septage wastes, but is considering a plan to do so in the future at M-1 and future expansion modules. See SPRR, Standard Prohibition C.1.b.

The County is also considering the use of dewatered sewage sludge as alternative daily cover (ADC). Any such proposal will include California Environmental Quality Act (CEQA) and other submittal documentation for review of the executive Officer. See Finding 61.
17. Approximately 600 tons per day (210,000 tons per year) of wastes, including MSW, agricultural, commercial, construction and demolition, and industrial wastes, were discharged to the landfill in 2014. About 12.8 million cubic yards (CY) of waste are estimated to be in place at the landfill corresponding to about 10% of the landfill’s estimated capacity at build-out.
18. The lowest elevation of solid waste at the landfill is about 222 feet mean sea level (MSL), corresponding to the inlet to the LCRS sump in the southeast corner of M-1. The lowest elevation of leachate at the landfill is 216 feet MSL corresponding to the bottom of the LCRS sump at Module 1. The maximum height of the landfill waste column is approximately 180 feet MSL.
19. LF-1 is an “existing” unit under Title 27 because it was an operating landfill at the time former Chapter 15 (now Title 27) regulations came into effect (27 November 1984) and was not subsequently reconstructed (e.g., retrofitted with a base liner) to meet Chapter 15 standards. Similarly, LF-2 (i.e., Module 1 and future LF-2 modules) is a “new” unit under Title 27 because construction of LF-2 began on or after the effective date of Chapter 15 regulations and the unit was required to be lined. See Title 27, section 20080(d). Also, LF-1 is an “existing MSWLF unit” and LF-2 is a “lateral expansion” of an existing unit. See Title 27, section 20164 (Specific Definitions).
20. Previous WDRs Order 89-018 reclassified LF-1 from a Class II-2 landfill unit under former Subchapter 15 regulations to a Class III landfill unit under Chapter 15 regulations. The reclassification was based on a finding that the natural geologic

materials underlying the unit were sufficiently protective of underlying groundwater beneficial uses to meet Class III unit containment standards in Title 27, sections 20240 and 20260. Monitoring data have since indicated, however, that waste constituents from LF-1 have migrated into the unsaturated zone and groundwater, indicating that the natural geologic materials underlying the site do not meet Class III containment standards.¹ Instead of declassifying or reclassifying LF-1, these WDRs require that LF-1 be closed given that it can no longer accept wastes because it does not meet Class III containment standards. See Findings 21 and 104; Closure and Postclosure Specification E.2.

21. A landfill's containment system includes its base liner, and, after closure, its final cover. Given that LF-1 was constructed and subsequently developed without a base liner prior to the enactment of Chapter 15 regulations in 1984, retrofitting the unit with a Class III level base liner is infeasible. These WDRs therefore require that the Discharger complete closure of LF-1 in accordance with Title 27 performance standards (i.e., to provide the unit with that portion of a Class III level containment system that is feasible to construct on the top deck and side slopes). See Title 27, section 20950(a)(2)(A)(1).
22. Given that these WDRs classify LF-1 and LF-2 as separate landfill units (see Finding 18), the Closure and Postclosure Specifications of this Order require that the Discharger submit separate closure plans for each unit. A revised Partial Final Closure and Postclosure Maintenance Plan (Partial FCP/PCMP) is required for LF-1 to complete closure of that unit and a revised Preliminary Closure and Postclosure Maintenance Plan (PC/PCMP) is required for LF-2.

SITE DESCRIPTION

23. The topography in the site area consists of low, rolling hills vegetated with native grass and areas of exposed soil/bedrock. Surface elevations at the site range from about 240 feet MSL in the southeast corner to about 360 feet MSL in the northeast corner of the site. The area grade is generally about 2% toward the west. One mile to the east the terrain becomes more hilly like foothill terrain.
24. Land uses within one mile of the site include agriculture, livestock grazing, dairies, industrial, and rural residential.
25. A 2014 Department of Water Resources (DWR) well survey identified at least 8 supply wells within a one-mile radius of the site, including one agricultural well and seven domestic wells. The wells ranged in depth from about 230 to 340 feet while

¹. Previous WDRs Order R5-2003-0020 (Finding 15), for example, stated, in part, "*The site characteristics where the Unit is located . . . are not suitable for a new Class III landfill contained in §20260(a) and (b)(1) of Title 27 without the construction of additional waste containment features in accordance with §20260(b)(2) of Title 27 and State Water Resources Control Board Resolution No. 93-62*".

static water levels measured in the wells ranged from 75 to 200 feet below ground surface (bgs). Estimated well pumping rates ranged from 35 to 200 gallons per minute (gpm). One offsite domestic well (Well No. 39-587) was identified within 1,000 feet of the landfill facility boundary. One onsite industrial supply well (LW-1) was also identified. See Attachment C: Site Map.

GEOLOGY

26. The regional geology in the area represents a transition between the Cretaceous - Quaternary age alluvial deposits of the Great Valley flood plain and the Jurassic age metamorphic rocks of the Sierra Nevada foothills. Valley deposits thin out within about a mile east of the site beyond which the surface geology is dominated by dissected alluvial uplands and exposed, uplifted bedrock characteristic of foothill terrain.
27. Valley deposits in the vicinity of the site include mid-to-late Pleistocene Modesto and Riverbank, Pliocene and early Pleistocene Laguna, and Miocene Mehrten deposits. The Mehrten occurs at the surface throughout the landfill property, except for the northeast corner which is mapped as Laguna. The Laguna soils generally consist of sand and gravel with minor silt and are typically weakly cemented with low to moderate permeability. The Mehrten soils consist of reworked volcanic mudflow deposits containing moderately cemented agglomerate, conglomerate, tuffaceous sandstone, and siltstone. Permeability is generally low. The Mehrten Formation also contains some andesitic mudflow breccias, which are also known as lahars. Both the Laguna and Mehrten can also contain expansive clay soil at the surface. Modesto and Riverbank formation deposits are found at the surface north and west of the site and adjacent to Mormon Slough.
28. The results of soil boring investigations conducted in 1985 and 1990 confirm that the site is underlain by Laguna alluvial deposits and cemented to partially-cemented Mehrten deposits. Laguna soils generally consist of silty sand, clayey silt, and silty clay to approximately 10 feet bgs.² Underlying Mehrten deposits generally include clay/claystone, silt/siltstone, sand/sandstone, and conglomerates.
29. Laboratory analysis of soil samples obtained during soil boring investigations of the site have indicated in-place hydraulic conductivities ranging from 1×10^{-3} cm/sec (sand/sandstone) to 1×10^{-7} cm/sec (clay/claystone). Remolded laboratory samples had lower conductivities.
30. The nearest historically active fault systems to the site include the Foothills Fault System 11 miles to the northeast; the Great Valley Fault Zone 38 miles to the south-

². Soil Conservation Service Survey descriptions indicate that surface soil at the site consists primarily of Peters Clay and various loam soils (i.e., Pentz sandy loam, Pentz-Bellota Complex, Keyes-Redding, Keyes-Bellota Complex, Lithic Xerorthents-Toomes Complex). The clay soils generally occur in flat areas.

southwest; the Clayton-Marsh Creek-Greenville Fault System 60 miles to the west; and the Calaveras Fault Zone 60 miles to the SW.

- a. The Foothills Fault System trends NW-SE along the western foothills of the Sierra Nevada Mountains. The highest magnitude earthquake historically recorded along the Foothills Fault system was a 1975 earthquake along the Cleveland Hills Fault near Oroville, which registered 5.8 on the Richter scale.
- b. The Great Valley Thrust Zone is a submerged, NW-SE trending fault system along the eastern foothills of the Coast Range. In 1892, an earthquake registering 6.5 on the Richter scale occurred in Winters and Vacaville along the Vaca Fault in this fault zone. Similar magnitude earthquakes have occurred along other segments of the Great Valley Thrust Zone.
- c. The Clayton-Marsh Creek-Greenville Fault System is a NW-SE trending, near-surface fault system extending north about 60 miles from the San Antonio Valley to Concord. This fault system is on the east-southeast side of Mt. Diablo, which is west of Foothill LF. In 1980, a 5.8 magnitude earthquake causing minor surface rupture occurred along the Greenville Fault near Mount Diablo.
- d. The Calaveras Fault Zone is a NW-SE trending, strike-slip fault zone extending north about 100 miles from south of Hollister to Danville. It is part of the larger San Andreas Fault System. In 1911, a 6.5 magnitude earthquake occurred along the fault in the Morgan Hill area, and in 2014, a 6.0 magnitude earthquake occurred along a northern extension of the fault near Napa.

Quaternary faults in the above fault systems and other fault systems potentially relevant to the site are identified in the Information Sheet. There are no known Holocene faults within 1,000 feet of the facility.

31. The maximum probable earthquake (MPE) for the site is estimated to be about 6.5 on the Richter scale based on the 1892 Vacaville/Winters earthquake in the Great Valley Thrust Zone noted above. A maximum magnitude earthquake of 6.5, occurring a mean distance of 41 miles from the site was computed based on an aerially-distributed hazard in the Foothills Fault System.³ The corresponding peak horizontal ground acceleration computed using this model was 0.14 g. Also see Information Sheet.

SURFACE WATER CONDITIONS

32. The site is about 1.5 miles south of the Calaveras River and 4 miles east of Mormon Slough, which branches off from the Calaveras River near Bellota about 3.5 miles northwest of the site. Surface drainage from the site flows into a network of streams and creeks that meander toward the southwest, ultimately emptying into Mormon Slough at two points near Linden and east Stockton, respectively. Mormon Slough is

³. Maximum magnitude earthquake derived from probabilistic seismic hazard (PSH) de-aggregation analysis assuming an earthquake in the Foothills Fault System with a 475-year return period (10% chance in 50 years).

partially tributary to the Stockton Diverting Canal, which drains into the Calaveras River, a tributary of the San Joaquin River. The remainder of Mormon Slough flows directly into the San Joaquin River in Stockton. The San Joaquin River discharges into the Sacramento-San Joaquin River Delta northwest of Stockton. See Attachment A: Location Map.

33. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition (hereafter Basin Plan) designates beneficial uses; establishes water quality objectives; contains implementation plans and policies for protecting waters of the basin; and incorporates by reference, plans and policies adopted by the State Water Resources Control Board.
34. The existing and potential designated beneficial uses of surface water, as specified in the Basin Plan, are municipal and domestic supply, agriculture (stock watering and irrigation), industrial (processing and service supply), water contact recreation (REC-1) and non-contact water recreation (REC-2), warm and cold freshwater habitat, warm and cold water migration of aquatic organisms, warm and cold water spawning, wildlife habitat, preservation of rare, threatened and endangered species, and groundwater recharge.
35. The landfill facility is not within a 100-year flood plain based on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, Community - Panel Number 06077C0390F, effective date October 16, 2009.
36. The site receives an average of about 18 inches per year of precipitation as determined from DWR Rainfall Depth Duration Frequency data for the Jenny Lind 3 SW Station about 4 miles northeast of the site. The average 24-hour precipitation event at this station is about 1.6 inches and the 100-year, 24-hour precipitation event for this station is about 3.3 inches. Weather conditions are statistically drier to the west and southwest of the site, where reported average annual rainfall is as low as 10 inches per year. The mean annual Pan A evaporation at the site is about 52.2 inches per year based on monthly average historical data from DWR's CIMIS Weather Station 70 (Manteca) about 22 miles southwest of the site.⁴ Mean monthly evaporation is estimated to exceed mean monthly precipitation in all months of the year, except January, February, and December. Net average annual evaporation at the site is estimated to be about 33.4 inches.
37. Storm water runoff captured by LF-1's precipitation and drainage controls is discharged via an unlined perimeter ditch to a large retention basin on the eastern side of the landfill. Runoff from LF-2, Module 1 is similarly conveyed to a small

⁴ A "Class A Evaporation Pan" is a standard-sized evaporation pan per U.S. National Weather Service specifications. The pan is filled to a specified level at the beginning of each day and after 24 hours the amount of water needed to restore that level (i.e., evaporation) is measured. When daily precipitation exceeds evaporation, water is similarly removed from the pan.

retention pond near the southwest corner of the module or to the borrow area immediately south of Module 1, which spills over toward an onsite stream discharging to a large stock pond in the southeast corner of the site. Water leaving the landfill property along this route is sampled under the State Water Board's General Industrial Storm Water Permit, as required under Standard Facility Specification E.15, SPRR.⁵ See also Finding 73, MRP Section A.4, and Attachment D: Drainage Controls & Monitoring.

38. All landfill drainage facilities, including overside drains, perimeter ditches, culverts, and sedimentation basins were designed to handle a 24-hour, 100-year storm event.

UNSATURATED ZONE CONDITIONS

39. The maximum estimated capillary rise in the unsaturated zone is estimated to be about 3.3 feet based on soil type. The minimum separation from waste to groundwater, taking into account the estimated capillary rise, is about 170 feet. See Findings 18 and 46.⁶

Soil Gas

40. In 2003, the Discharger installed 11 single-completion soil gas monitoring probes (SG-1 through SG-11) within 400 feet of the landfill unit to monitor for landfill gas migration. Ten of the probes, SG-2 through SG-11, are shallow probes completed to depths ranging from 25 to 68 feet bgs. The other probe, SG-1, is a deep probe completed to a depth of 255 feet bgs. SG-1 is also the closest probe to the landfill, installed 100 feet from the landfill unit. Probe SG-8 was abandoned in 2012 in preparation for construction of Module 2. The existing and former probe locations are shown in Attachment E: Gas Controls & Monitoring.
41. Landfill gas has generally been detected at low concentrations in all of the above soil gas probes, except for SG-11 on the west side of LF-1, where methane and carbon dioxide have been detected up to 17% and 16% by volume, respectively. All of the probes have indicated the presence of volatile organic compounds (VOCs), however. The most VOC-impacted probes included SG-6, SG-11 and deep probe, SG-1, which had the highest concentration of vinyl chloride (418 ppbv). The results of these three soil gas probes are summarized below.

5. *State Water Resources Control Board Quality Order No. 97-03-DWQ National Pollutant Discharge Elimination System (NPDES) General Permit No. Cas000001 Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities.*

6. Calculation based on lowest elevation of waste (216 feet MSL) and estimated highest groundwater elevation (46 feet MSL, including capillary rise) at M-1's LCRS sump.

Soil Gas Probe Monitoring Results			
Constituent	Average Concentration, ppbv ¹		
	Shallow		Deep
	<u>SG-6</u>	<u>SG-11</u> ²	<u>SG-1</u>
Freon 11	382	4.5	<0.5
Freon 12	1,054	600	115
Freon 113	23.1	0.6	<0.5
Freon 114	42.6	153	<0.5
Toluene	67.9	80.8	53
Vinyl Chloride	<0.5	36.6	418

1. Based on semiannual monitoring conducted from October 2003 through March 2014.
2. This probe also had the highest concentration of methane (17% by volume).

The monitoring and reporting program in these WDRs requires that the Discharger continue semiannual monitoring of all the unit perimeter soil gas probes for field gases and sample a probe for VOCs any time the field gas concentration in that probe exceeds a specified threshold criteria based on field measurement of methane and total organic vapor concentrations. See MRP, Section A.2.b.ii.⁷

42. The soil gas monitoring system also includes 25 triple probe methane migration monitoring wells (SG-12 and SG-102 through SG-125) installed along the facility perimeter to per Local Enforcement Agency (LEA) requirements (Title 27, section 20919 et seq.). Soil gas well SG-12 was installed in 2004 and soil gas wells SG-102 through SG-125 were installed in 2009. All wells were completed to a maximum depth of 160 feet MSL with upper, intermediate, and lower zone nested probes relative to landfill waste. The locations of these wells are shown in Attachment E: Gas Controls & Monitoring.
43. Semiannual monitoring of the methane migration monitoring wells at the site conducted under the facility's Solid Waste Facilities Permit has not indicated any methane exceedances along the site perimeter since installation of the wells. Also, the wells were not historically monitored under previous WDRs, which were adopted in 2003 before installation of the wells. Given the detection of methane and VOCs in the soil gas probes along the perimeter of the landfill unit, these WDRs require that the Discharger conduct VOC sampling at any methane migration monitoring well or probe in which the above threshold criteria is exceeded.⁷ Copies of the monitoring results submitted to the LEA are also required. See MRP, Section A.2.b.ii.

Soil Pore Water

44. LF-1 does not have a soil pore water monitoring system given that it is unlined and predates Chapter 15 regulations. LF-2, Module 1 was constructed with four suction

⁷. VOC sampling required in all soil pore gas probes in which methane is detected above 1% by volume and/or total organic vapors are detected above 50 ppbv during a monitoring event.

lysimeters, including one background lysimeter (LZ-1) installed near the northeast site boundary and three detection lysimeters (LZs-2, 3, and 4) installed beneath the module's containment system. LZ-2 was installed beneath the LCRS sump in the southeast corner of the module; LZ-3 was installed beneath an LCRS trench in the northeast part of the module; and LZ-4 was installed beneath the base liner in the southwest corner of the module. Soil pore water monitoring devices installed at future LF-2 modules, beginning with Module 2, Phase A, will consist of one or more pan lysimeters, including at least one pan lysimeter installed beneath the module's LCRS sump. See MRP Section A.2.a and Attachment C: Site Map.

No liquid has been detected in any of the lysimeters at LF-2, Module 1 since their installation in 2003. This supports findings that LF-1 is the source of VOC impacts detected in soil gas and groundwater at the site.

45. No leachate monitoring is conducted at LF-1 (other than seep monitoring) because it is unlined and is not equipped with an LCRS sump. The Discharger has been conducting semiannual leachate sump monitoring at LF-2, Module 1 since 2005, however. The results of this monitoring are summarized in the table below.

LF-2, Module 1 Leachate Monitoring Results ¹	
<u>Constituent</u>	<u>Average Concentration</u>
General Minerals	<i>mg/L</i>
Chloride	208
Total Dissolved Solids	1,565
VOCs ²	<i>µg/L</i>
1,1-Dichloroethane	4
Ethyl benzene	12
Methyl tert-butyl ether	96
Tetrachloroethene (PCE)	2
Toluene	32
Trichloroethene (TCE)	3
Total Xylenes	26
2-butanone (MEK)	1,214
4-methyl-2-pentanone	46

1. Results based on semiannual LCRS sump monitoring conducted since 2005.
 2. Listing includes most, but not all, VOCs detected in the module sumps during the monitoring period.

During the First Half 2014, the leachate flow rate to the sump averaged 33,600 gallons per month. MRP Section D requires that the Discharger monitor leachate monthly for flow rate and other field parameters and annually for landfill constituents of concern.

GROUNDWATER CONDITIONS

46. First encountered groundwater at the site varies from about 200 to 300 feet bgs. Groundwater elevations generally range from about 36 feet MSL on the southern side of the site to about 61 feet MSL on the northern side of the site +/- 1 foot of seasonal variation. The average groundwater elevation at the site is about 45 feet MSL. The uppermost aquifer beneath the site occurs in Mehrten alluvium (e.g., sandy gravel) under confined or partially confined conditions. The overall permeability of these deposits is estimated to be about 9×10^{-3} cm/sec based on monitoring well slug testing data for similar alluvial deposits at the North County Landfill about eight miles northwest of the site. The groundwater gradient is typically about 0.0025 ft/ft toward the southeast, corresponding to a groundwater flow velocity of about 84 ft/yr. In the southwest corner of the site, the gradient appears to turn toward the southwest. Additional definition of the gradient direction in this area will be possible after collecting a sufficient amount of monitoring data (e.g., at least two semiannual periods) from recently-installed monitoring well MW-6 (see Finding 49).
47. Background groundwater quality in the uppermost aquifer at the site is relatively good including total dissolved solids (TDS) at about 210 mg/L, electrical conductivity at about 270 mg/L, chloride at about 6 mg/L, sulfate at about 8 mg/L, and bicarbonate alkalinity at about 140 mg/L.
48. The beneficial uses of underlying groundwater stated in the Basin Plan are municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply.
49. The groundwater monitoring system at the site currently consists of one background well (MW-4), two side gradient wells (MW-1A, and MW-3), and three down gradient wells (MW-2R, MW-5, and MW-6).⁸ MW-2R and MW-3 are Point of Compliance wells for LF-1 and LF-2 (Module 1), respectively, while MW-5 (installed in 2010) and MW-6 (installed in 2015) contiguously monitor both landfill units along the southern site boundary. See MRP Section A.1.a and Attachment C: Site Map.
50. As part of the Water Quality Protection Standard, Title 27, section 20415(b)(1) requires that the Discharger establish a sufficient number of monitoring wells along the landfill Point of Compliance (e.g., downgradient perimeter of unit) for detection and corrective action monitoring purposes. See Standard Monitoring Specification I.29, SPRR. A Point of Compliance well was not installed directly down gradient of LF-1, however, because previous WDRs classified LF-1 and LF-2 (i.e., Module 1 and the future Subtitle D lined expansion modules) as a single landfill unit with a Point of Compliance along its southern perimeter. Given that these WDRs classify the landfill as two separate units, each with its own Point of Compliance along the southern

⁸ Monitoring well MW-1A was installed in 2013 as a replacement well for MW-1, which could no longer be sampled due to declining water levels. Another historical monitoring well, MW-2, was abandoned and replaced with nearby well MW-2R in 2003 to accommodate development of LF-2, Module 1.

perimeter of each unit, and that the two landfills were constructed and developed contiguously as a single unit under previous WDRs, the Discharger has adequately demonstrated that it is no longer feasible to install Point of Compliance wells down gradient of LF-1 (e.g., such a well would puncture the HDPE barrier layer separating the units and would likely be unstable due to landfill settlement). MRP No. R5-2015-0058 therefore allows for contiguous monitoring of both units along the downgradient perimeter of LF-2 per Title 27, section 20410(e)(3), with LF-1 in corrective action monitoring and LF-2 in detection monitoring. The groundwater monitoring system for both units complies with applicable Title 27 performance standards for detection and corrective action monitoring. See MRP Section A.1.

51. Low to trace concentrations of VOCs, primarily of Trichloroethene (TCE) and 1,1-Dichloroethene (DCE), have been intermittently detected in monitoring well MW-3 adjacent to unlined LF-1 since 1995, indicating a historical release from LF-1. For example, in January 1995, TCE was detected in MW-3 at a concentration of 0.9 µg/L and has been subsequently detected in the well up to 4.0 µg/L (January 1999). TCE was also detected in this well in 7 out of the last 9 semiannual monitoring events conducted at the site through the First Half 2014 and was most recently detected a concentration of 1.4 µg/L. DCE has been historically detected in MW-3 at trace concentrations. Time series plots of VOC monitoring data in MW-3 suggest a moderate increasing trend in MW-3 over the past 5 years. No VOCs have been confirmed in any of the other groundwater monitoring wells at the site.

In 2006, the Discharger implemented various corrective action measures (e.g., partial landfill closure, landfill gas extraction) to address the VOC release under Cleanup and Abatement Order (CAO) R5-2004-0706 issued by the Executive Officer (see Finding 95). The monitoring and reporting program of these WDRs requires corrective action monitoring of LF-1 to assess the effectiveness of these measures and groundwater cleanup.

52. No significant exceedances of inorganic parameters have been historically confirmed at the site. The concentration of chloride and total dissolved solids (TDS) detected in MW-3, for example, have historically averaged about 9.5 mg/L and 207 mg/L, respectively, compared to calculated concentration limits of 7.5 mg/L and 260 mg/L using historical monitoring data from background well MW-4. (The slight chloride exceedance could be spatial variability.) The absence of confirmed inorganics impacts to groundwater at the site indicates that the release is likely due to a landfill gas release from the unlined landfill, LF-1.
53. A review of the files indicates that no Water Quality Protection Standard (WQPS) Report has ever been submitted for this site. Previous WDRs specified concentration limits for organic constituents and some inorganic constituents, while concentration limits for certain other inorganic constituents were left to be determined based on future monitoring results. These WDRs require that the Discharger develop a complete list of concentration limits for each landfill unit and submit a WQPS Report

describing the WQPS for each unit consistent with the requirements of this Order. See Provision H.7 and MRP Section C.4.

Monitoring Data Analysis Methods

54. Volatile organic compounds (VOCs) are often detected in a release from a MSW landfill and are often associated with releases of landfill gas rather than leachate. Since volatile organic compounds are not naturally occurring and thus have no background value, they are not amenable to the statistical analysis procedures contained in Title 27 for the determination of a release of wastes from a landfill unit. Title 27, sections 20415(e)(8) and (9) allow the use of a non-statistical evaluation of monitoring data that will provide the best assurance of the earliest possible detection of a release from a landfill unit in accordance with Title 27, sections 20415(b)(1)(B)(2 - 4). However, Title 27 does not specify a specific method for non-statistical evaluation of monitoring data.
55. The Central Valley Water Board may specify a non-statistical data analysis method pursuant to Title 27, section 20080(a)(1). Water Code section 13360(a)(1) allows the Central Valley Water Board to specify requirements to protect groundwater or surface waters from leakage from a solid waste site, which includes a method to provide the best assurance of determining the earliest possible detection of a release. In order to provide the best assurance of the earliest possible detection of a release of non-naturally occurring waste constituents from a landfill unit, the SPRRs specify a non-statistical method for the evaluation of monitoring data for non-naturally occurring compounds. The specified non-statistical method for evaluation of monitoring data provides two criteria (or triggers) for making the determination that there has been a release of non-naturally occurring waste constituents from a landfill unit. The presence of two non-naturally occurring waste constituents above their respective method detection limit (MDL), or one non-naturally occurring waste constituent detected above its practical quantitation limit (PQL) [a.k.a, laboratory reporting limit (RL)], indicates that a release of waste from a Unit has occurred. Following an indication of a release, verification testing must be conducted to determine whether there has been a release from the landfill unit or the detection was a false detection. The detection of two non-naturally occurring waste constituents above the MDL as a trigger is appropriate due to the higher risk of false-positive analytical results and the corresponding increase in sampling and analytical expenses from the use of one non-naturally occurring waste constituent above its MDL as a trigger.
56. For a naturally occurring constituent of concern, the Title 27 requires concentration limits for each constituent of concern be determined as follows:
 - a. By calculation in accordance with a statistical method pursuant to Title 27, section 20415(e)(8); or
 - b. By an alternate statistical method meeting the requirements of Title 27, section 20415(e)(8)(E).

57. 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.

The MRP of these WDRs requires that concentration limits for naturally-occurring constituents be based on an interwell approach absent a satisfactory demonstration that an intrawell approach is justified at the site (e.g., existence of significant spatial variability not attributable to a release from the unit). Consistent with monitoring reports submitted under previous WDRs, MRP No. R5-2015-0058 specifies that the method of Interwell Tolerance Limits be used to calculate concentration limits for naturally-occurring constituents at the site. For evaluation of corrective action progress (i.e., trends), the monitoring program specifies an intrawell statistical procedure (e.g., Sens Slope Method). See Section C.4, MRP.

58. To demonstrate that corrective action has been completed (i.e., concentrations along Point of Compliance returned to compliance with the water quality protection standard), Monitoring Specification G.7 specifies a four year "proof" period. During this period, the Discharger must demonstrate that all constituents of the release have been reduced to concentration limits for at least eight consecutive semiannual monitoring events.

LANDFILL OPERATIONS

59. Waste disposal is conducted by the area-ramp method. Filling of a new module generally begins along the side adjacent to the previous module. Refuse is placed in 6 to 10 foot lifts and spread and compacted on a sloped working face (about 100' x 90') until the lift is about two feet thick. The waste is inspected for unauthorized or hazardous wastes as it is spread. Diversionary berms are constructed in the wet season to divert storm water away from the working face. During the wet season, cover soil is stockpiled near the working face.
60. Cover soil for landfill operations is obtained from the long term borrow area west of Module 1 or from module construction areas. A refuse to soil ratio of approximately 4:1 is maintained for daily cover, which is applied at the working face in 6-inch minimum lifts. Tarps are employed as alternative daily cover (ADC). Intermediate cover soil of 12-inches minimum thickness is placed in areas that will be inactive for at least 180 days per Title 27, CCR Section 20705.
61. Landfills propose new ADC materials regularly in order to preserve landfill air space

and to beneficially reuse waste materials. Title 27, section 20686 includes regulations for beneficial reuse, including use of ADC. Approval of ADC is primarily handled by the LEA and CalRecycle under Title 27, section 20690. This Order allows any ADC proposed for use at the facility after the adoption of this Order to be approved by Central Valley Water Board' Executive Officer provided the Discharger has demonstrated it meets the requirements in Title 27, section 20705. See Discharge Specification B.2.

Leachate and Condensate Management

62. Leachate and condensate handling facilities at the site currently include Module 1's LCRS sumps (primary and secondary) and associated controls; a 10,000 gallon leachate storage tank (near the LFG flare station); a leachate return line; condensate traps and return lines; and other related facilities. Similar leachate and condensate handling facilities will be installed at the site on an as-needed basis as future landfill modules (each with an LCRS and LCRS sump) are developed. See also Finding 98.
63. Title 27, section 20340(g) requires that leachate be returned to the unit from which it came or be discharged in a manner approved by the regional board. This section of Title 27 also references State Water Board Resolution 93-62 regarding liquids restrictions in 40 C.F.R. section 258.28 for MSW landfills. 40 C.F.R. section 258.28 states that liquid waste may not be placed in MSW landfill units unless the waste is leachate or gas condensate derived from the landfill unit and it is designed with a composite liner and an LCRS. Therefore, leachate and landfill gas condensate from composite lined units with an LCRS may be returned to the unit from which they came, but may not be discharged to another MSW landfill unit. Similarly, landfill gas condensate obtained from an unlined unit may not be returned to that unit because it is not compositely-lined, and it may not be discharged to another MSW landfill unit because it did not originate from that unit.
64. No leachate is collected from unlined unit LF-1 because it does not have an LCRS. Leachate collected from compositely-lined Module 1 (including any leakage collected in the secondary sump) is generally returned to Module 1 via a return line to infusion points on the landfill top deck. Depending on needs and other factors, leachate may alternatively be routed to the onsite storage tank (located near the LFG flare station) for later application to M-1 (i.e., infusion and/or dust control).
65. The Discharger proposes to continue the practice of returning leachate to the same module from which it was collected, or if necessary depending on operational factors, to another compositely-lined LF-2 module. No leachate may be discharged to Module I, however, since it is unlined and does not have an LCRS. Consistent with Title 27 and Subtitle D regulations, these WDRs allow the Discharger to continue returning landfill leachate to existing and future compositely-lined LF-2 modules, as proposed, but prohibits the discharge of leachate to LF-1, which is a separate, unlined MSW landfill unit, See Discharge Prohibition A.3 and Discharge Specification B.5.

66. Previous WDRs authorized the discharge of LFG condensate derived from unlined Module I to lined Module 1 because the two modules were considered to be within the same MSW landfill unit. The Discharger therefore historically commingled landfill gas collected from unlined Module I and lined Module 1 and discharged the condensate obtained from the commingled gas to Module 1's LCRS sump. Given that these WDRs classify Module I as a separate, existing MSW landfill unit (LF-1), the Discharger is no longer authorized to discharge condensate derived from unlined LF-1 (Module I) to existing or future LF-2 modules. These WDRs require that the Discharger submit an operations plan for the LFG extraction system, including a plan to remove and handle LFG condensate derived from LF-1 separately so that it can be appropriately disposed of at an authorized facility. See Discharge Prohibition A.3.b and Facility Specification C.1.

LANDFILL DESIGN AND CONSTRUCTION

67. On 17 June 1993, the State Water Board adopted Resolution 93-62 implementing a State Policy for the construction, monitoring, and operation of municipal solid waste landfills that is consistent with the federal municipal solid waste regulations promulgated under 40 Code of Federal Regulations section 258 (Subtitle D). Resolution 93-62 requires the construction of a specified composite liner system at new municipal solid waste landfills, or expansion areas of existing municipal solid waste landfills, that receive wastes after 9 October 1993. Resolution 93-62 also allows the Central Valley Water Board to consider the approval of engineered alternatives to the prescriptive standard. Section III.A.b. of Resolution 93-62 requires that the engineered alternative liner systems be of a composite design similar to the prescriptive standard.
68. Title 27, section 20080(b) allows the Central Valley Water Board to consider the approval of an engineered alternative design (EAD) to the prescriptive standard. In order to approve an EAD in accordance with Title 27, sections 20080(c)(1) and (2), the Discharger must demonstrate that the prescriptive design is unreasonably and unnecessarily burdensome and will cost substantially more than an alternative which will meet the criteria contained in Title 27, section 20080(b), or would be impractical and would not promote attainment of applicable performance standards. The Discharger must also demonstrate that the proposed engineered alternative liner system is consistent with the performance goal addressed by the particular prescriptive standard, and provides protection against water quality impairment equivalent to the prescriptive standard in accordance with Title 27, section 20080(b)(2).
69. Water Code section 13360(a)(1) allows the Central Valley Water Board to specify the design, type of construction, and/or particular manner in which compliance must be met in waste discharge requirements or orders for the discharge of waste at solid waste disposal facilities.

Landfill 1

70. LF-1 (Module 1) is an 84-acre, partially-closed landfill unit in the central portion of the site. As the original Foothill Landfill disposal module, the unit predated Title 27 regulatory standards and was not constructed with a Title 27 containment system or LCRS.
71. The landfill is approximately triangular-shaped with 2,000 foot long sides. The top deck area (also triangular-shaped similar to the base) was partially-closed with an ET cover in 2006, as described in Finding 103. The base elevation of the unit is unknown due to the unavailability of historical construction documents, but is estimated to be about 250 feet MSL. The maximum elevation of the landfill is about 432 feet MSL, including final cover, corresponding to about 170 feet above surrounding grade. The maximum height of the LF-1 waste column is estimated to be about 180 feet. See Attachment C: Site Map.
72. LF-1's exterior side slopes were graded to an average of about 4H:1V with 15-foot wide side slope benches every 50 feet of vertical height. All side slopes except for the southern slope were filled to planned final waste grade and covered with up to 3 feet of interim cover soil, including partial cover soil placed on the slopes under the 2006 Site Improvement Program (see Finding 96). A geomembrane barrier layer was also installed on the lower portion of the southern slope during the second phase of Module 1. Various erosion and drainage control improvements were also implemented at the module to bring it into compliance with Title 27 standards.
73. Precipitation and drainage controls installed on the landfill module included:
 - a. Top decks graded at 5% minimum for drainage.
 - b. Soil berms along top deck perimeter to direct runoff to corner drop inlets.
 - c. Overside drains to capture top deck and side slope bench drain flows.
 - d. Ditches installed alongside slope benches to intercept and convey sheet flow runoff to overside drains. Benches also graded for sheet flow runoff.
 - e. Landfill perimeter ditches to convey collected runoff to onsite storm water basins. See Finding 37.
 - f. Velocity controls (e.g., erosion control blanket, rip rap) at appropriate locations in bench drains and landfill perimeter ditches to reduce erosion.

Landfill 2

74. Previous WDRs Order R5-2003-0020 approved an EAD to the Title 27/Subtitle D prescriptive liner design for an MSW landfill proposed by the Discharger for the containment systems of LF-2, Module 1 and future expansion modules at the site.

The approved EAD included the following elements:⁹

<u>Component</u>	<u>Base Liner</u>	<u>Side Slopes</u>
Operations Layer	2 feet soil	
Filter Fabric	Geotextile ¹	Geocomposite ²
LCRS	9-inch gravel drainage layer	
	4-inch HDPE collection piping in drainage troughs	
Base Liner	60-mil HDPE ³	
	Geosynthetic Clay Liner (GCL)	
Foundation Layer	Prepared subgrade	
	≥ 1 foot	Thickness not specified

1. Geotextile consists of 8 oz/yd² non-woven fabric.
2. Geonet with above geotextile on both sides.
3. HDPE double-side textured.

In authorizing the above EAD for the landfill's containment system, previous WDRs found that the Discharger had made the requisite demonstration under Title 27, Section 20080(b) that construction of the prescriptive design was infeasible and that the proposed EAD met Title 27 performance standards. See Information Sheet.

75. The first phase of Module 1 (M-1A) was constructed in 2003 in accordance with the above EAD. M-1A consisted of a 34-acre expansion of the landfill footprint immediately south of LF-1. Excavation side slopes were graded to 1H:1V, forming the sides of native soil berms constructed around the module. The foundation layer was graded from northwest (267 feet MSL) to the southeast (225 feet MSL) at a slope of 3%. Anchor trenches were cut into the northern and southern perimeter berms to anchor the liner.
76. The second phase of Module 1 (M-1B), constructed in 2006, consisted of a northward extension of the landfill footprint over a native soil berm between LF-1 and LF-2 and the filling of wastes up against the lower slopes of unlined unit LF-1. A geomembrane barrier layer was installed in the area of overlap between the two modules as a corrective action measure to help prevent leachate and gas migration into LF-1.¹⁰

As described in Finding 7, these WDRs classify LF-1 and LF-2 as separate landfill units under Title 27. As such, these WDRs require that all future LF-2 liner

⁹. Under Title 27, section 20080(b), the Discharger may construct an engineered alternative to the Title 27 prescriptive standard provided that the requisite demonstration is made (e.g., that the design meets Title 27 performance standards and that compliance with the prescriptive standard is not feasible).

¹⁰. The geomembrane barrier layer was not a construction requirement because the landfill was considered a single unit under previous WDRs and therefore the overlap area did not constitute an expansion of the landfill footprint under Title 27/Subtitle D. See Finding 96.b and Title 27, section 20164.

extensions overlapping unlined unit LF-1 meet Title 27 containment system standards for a Class III, existing (i.e., pre-Subtitle D) MSW landfill (i.e., non-composite compacted clay liner or equivalent). See Construction Specification D.1; Title 27, sections 20330 and 20340.

77. Module 1's LCRS layer included a 9-inch layer of drainage gravel on the landfill's base liner and geonet on the landfill's interior side slopes. The gravel layer was designed for sheet flow drainage (3% grade) to a collection sump constructed in the southeast corner of the module. Perforated HDPE collection piping, including six, 4-inch laterals and a 6-inch header, were also installed to assist drainage and minimize leachate head on the liner. Five of the laterals (each cross-sloping from west to east at a 2% grade) were plumbed to a header pipe installed in a gravel-filled trough along the eastern side of the module. The other lateral was installed in a collection trough along the southern side of the module and plumbed directly to the sump. Each end of the laterals was connected to a riser extending up the side slope to allow for inspection and cleaning, if necessary.
78. Module 1's LCRS sump was designed as follows, from top to bottom:
 - a. A geotextile separator layer (immediately underlying the module's LCRS);
 - b. Up to 4 feet of LCRS sump gravel;
 - c. A geotextile cushion layer;
 - d. Primary composite liner;
 - e. A secondary sump;
 - f. A secondary composite liner; and
 - g. One foot of prepared foundation soil.

Both the primary and secondary sump liners were constructed in accordance with the EAD approved under previous WDRs.

79. The primary sump was constructed to a maximum depth of 4 feet (216 feet MSL) with 3H:1V side slopes. A dedicated submersible sump pump with a liquid level sensor installed in an 18" HDPE sump collection/riser pipe to control sump liquid levels was included in the design. External controls allowed for setting the pump cycle to ensure that the sump is pumped off. The system also included alarms set at minimum and maximum allowable liquid levels to ensure safe pump operation and to prevent head buildup on the liner beyond the sump. Volume pumped was also automatically recorded.
80. A secondary sump was also included in the design to monitor the primary sump for leaks. The secondary sump consisted of a geonet blanket layer (sandwiched between the primary and secondary composite liners) draining into a 2-foot deep gravel-filled trench underlying the primary sump. 12-inch HDPE collection and riser piping housing a bubbler line to measure liquid level were also included in the secondary sump design. A submersible pump was also installed in the secondary sump to pump and return any leakage to the primary sump.

81. All components of M-1's LCRS, including blanket layer, piping, sump, and handling facilities were designed to meet Title 27 performance standards using appropriate engineering methods and models (e.g., Hydraulic Evaluation of Landfill Performance (HELP) Model Version 3.07, pipe flow calculations).
82. The exterior side slopes of Module 1 were graded with slopes not exceeding 3.4H:1V with 15-foot wide benches every 50 vertical feet. A 200 foot setback from the site perimeter was also maintained. Precipitation and drainage controls installed at the module were similar to those installed at LF-1. See Findings 37 and 73.

Module 2

83. On 27 January 2015, Central Valley Water Board staff approved the design report for Module 2 (M-2), the next landfill expansion module to be constructed at the site. M-2 will be constructed contiguous with, and immediately south of, Module 1.¹¹ The new module's footprint will be built-out in two phases, including a 14-acre first phase (M-2A) scheduled for completion by the end of 2015, and a second phase (M-2B) scheduled for completion by the end of 2018. The modules' containment system (i.e., base liner and excavation side slopes) will consist of the approved EAD authorized under the previous WDRs. M-2's containment system will therefore be the same as M-1's, absent a Title 27-lined interior side slope overlapping LF-1.
84. M-2A's foundation layer will generally be graded to slope from west (222 feet MSL) to east (210 feet MSL) at a 1% grade. Three parallel V-drains each one foot deep with 3H:1V side slopes will be cut into the foundation layer for the overlying LCRS (described below). The module's excavation side slopes will be 2H:1V on all sides except the east side, which will be 3H:1V. An access road will also be constructed on the west side of the module. The M-2B area will be used as a staging area during M-2A construction.
85. M-2A's LCRS will include a 9-inch thick gravel blanket layer overlying three east-sloping, gravel-filled V-drains. The effective drainage grade within the V-drains will be 2% toward the east-sloping center line. Four-inch lateral collection piping will be installed in the V-drains to assist drainage. Two of the laterals/V-drains will be plumbed to a 6-inch perforated header pipe running along the eastern side of the module, while the other V-drain will be plumbed directly into the LCRS sump. Each lateral will be accessible for inspection and cleaning via riser pipe extending up the eastern excavation slope.
86. Drainage calculations for M-2's LCRS are summarized as follows:

11. See 5 October 2014 *Design Report, Area 2A Expansion, Foothill Sanitary Landfill*, prepared by Geosyntec, Inc..

Data Source	Leachate Head	Peak Flow Rate			
	Inches	Gal/min			
		Blanket Layer		LCRS Piping/Trenches	
	Base Liner	Gravel	Geonet	Lateral	Header
Model ^{1,2}	1	71	18.4	76	148
Regulatory Standard	<12 ³	142	37 ⁴	152 ⁴	296 ⁴
Design	9	568	295	512	512

1. Based on anticipated or “worst case” peak conditions (e.g., high precipitation, infiltration and runoff during initial waste filling operations) using HELP) Model, Version 3.07.
2. The maximum daily leachate flow calculated using the HELP model was 9,231 gal/acre/day corresponding to 133,826 gal/day over the 14.5 acre module area.
3. Based on 30 cm maximum head authorized for MSW landfill under Subtitle D regulations. See Standard Construction Specification F.2, SPRR.
4. Twice anticipated peak daily flow rate derived from HELP model (expressed in gpm) per Title 27, Section 20340(b).

87. M-2A’s LCRS sump will be constructed in the southeast corner of the M-2A area and will be designed and operated similar to M-1’s LCRS sump. The sump pump will be sized to handle calculated maximum daily and annual average leachate flow rates to the sump (93 gpm and 5 gpm, respectively). A separate LCRS sump may be constructed for the M-2B area.
88. The Discharger plans to construct future modules consistent with existing approvals for Modules 1 and 2, or as separately proposed and approved for a new module. Specific designs and construction plans will be submitted for approval as each module is proposed for development.

Construction Specifications D.1 through D.4 of these WDRs require that new LF-2 modules be constructed consistent with the EAD approved under previous WDRs and Title 27 containment requirements applicable to sideslope development over an existing, unlined MSW landfill (i.e., non-composite compacted clay liner or equivalent). Construction Specification D.6 further allows for the Executive Officer to approve less than significant changes to these designs, but requires Board approval of substantive changes.

Slope Stability

89. Updated slope stability analysis (see January 2012 *Updated Slope Stability Analysis for Foothill Sanitary Landfill*, prepared by Shaw Environmental, Inc.; and 20 January 2015 supplemental report *Review of the Stability Analysis at the Foothill Landfill*, prepared by CB&I) focused on LF-1 and the southern part of LF-2 where Modules 2 and 3 will be developed along the unit perimeter over the next several years, reaching approximate final cover grade. The following representative cross-sections were evaluated in this area to assess both interim and global landfill slope stability:

- a. Interim: N-S section of southern fill slope over interface between Module 1 and Module 2.
 - b. Interim: E-W section of western fill slope over interface between Module 2 and future Module 3.
 - c. Global: N-S section of southern final cover slope spanning LF-1, M-1, and M-2.
90. Slope stability analysis was performed on the above cross sections using the SLIDE© (Version 6.0013) software program developed by Rocscience, Incorporated. The program performs two-dimensional limit equilibrium analysis using the method of slices to compute factors of safety based on various analysis procedures. These procedures are included the Morgenstern-Price method, which considers both force and moment equilibrium. Critical interface failure envelopes were developed for the modules based on the results of laboratory shear testing of liner components up to maximum expected loads and other factors. Computed static safety factors for the two interim fill slopes were 1.3 (southern) and 2.0 (western) and global safety factors computed for the landfill (i.e., southern final cover slope) were to 2.34 (static) and 1.8 (pseudo-static). Critical interfaces included the geocomposite-geomembrane interface, the geomembrane-GCL interface, and internal failure of the GCL.
91. A peak horizontal ground acceleration of 0.054 g was used in dynamic slope stability analysis based on an earthquake of moment magnitude 8.1 occurring along the San Andreas fault zone about 85 miles west of the site. Deformation analysis indicated an estimated displacement of approximately 0.3 inches, well below the 12-inch maximum recommended by the USEPA in its 1995 publication *Seismic Design Guidance for Municipal Solid Waste Landfills*.

CORRECTIVE ACTION

92. Previous WDRs Order No. R5-2003-0020 required that the Discharger implement an Evaluation Monitoring Program (EMP) to investigate the nature and extent of groundwater impacts at the site and, by 1 June 2003, submit an Engineering Feasibility Study (EFS) report proposing corrective action measures, including a plan for closure of LF-1. A partial cover work plan for LF-1 was also required to be submitted by the same date.
93. In June 2003, the Discharger completed implementation of the EMP, including installation of temporary borings down gradient of MW-3 to delineate the extent of the release; a deep soil gas probe (SG-1) to sample for VOCs in soil gas near the water table; and VOC sampling. No VOCs were detected in groundwater samples collected from the temporary borings and MW-3. Four VOCs were detected in soil gas at SG-1, but none of them matched those previously detected in groundwater at MW-3. No VOCs were detected in groundwater during the investigation.
94. On 30 October 2003, in response to a September 2003 California Water Code Section 13267 Order issued by the Executive Officer, the Discharger submitted an

EFS report and a partial cover work plan (*Partial Cover Workplan and the Engineering Feasibility Report and Corrective Action Program, Based on the Results of the Evaluation Monitoring Plan at the Foothill Sanitary Landfill*, prepared by San Joaquin County Department of Public Works). The EFS report attributed the groundwater impacts to localized infiltration from exposed wastes along the edge of the landfill near MW-3 and indicated that the issue had been resolved in 1998 by grading and covering the area. The EFS did not recommend any further corrective action measures and did not include a work plan for closure of LF-1.

95. On 16 December 2003, the Executive Officer issued an Administrative Civil Liability Complaint (ACLC No. R5-2003-0159) in the amount of \$10,000 for failure to submit the required work plan for closure of LF-1 in violation of the Section 13267 Order. Subsequent negotiations resulted in a formal Settlement Agreement by which the Discharger agreed to pay the \$10,000 in proposed administrative civil liability and accept a Cleanup and Abatement Order (CAO R5-2004-0706) implementing a Site Improvement Project proposed by the Discharger to address the threat to groundwater from LF-1. A revised ACL Complaint (ACLC No. R5-2004-0520) was also issued acknowledging the agreement. The Executive Officer agreed to recommend a modification of WDRs Order No. R5- 2003-0020 to be consistent with CAO R5-2004-0706 if landfill gas releases were successfully eliminated.

96. The Site Improvement Project incorporated into CAO R5-2004-0706 included the following components;¹²

- a. Final closure of the crest of LF-1;
- b. Installation of an overlay barrier between Module I refuse and Module 1's expansion side slope;
- c. Installation of partial and intermediate cover over areas of LF-1 not included above;
- d. Implementation of landfill drainage and erosion controls;
- e. Installation of a landfill gas collection system; and
- f. Installation of at least two additional groundwater monitoring wells.

CAO R5-2004-0706 required submission of various plans and reports corresponding to the above tasks and specified a 1 November 2006 due date for completion of the project including initiation of gas extraction. (This due date was ultimately extended to 24 February 2007 to provide the Discharger time to complete installation of the LFG extraction system.)

97. Each plan required under CAO R5-2004-0706 was ultimately submitted by the Discharger and implemented as approved by Central Valley Water Board staff. Plans

12. See 16 January 2004 letter *Proposal to Address RWQCB Staff Concerns Regarding Foothill Sanitary Landfill Module I* from Steven Winkler, San Joaquin Co. DPW to Thomas Pinkos, Central Valley Water Board and 2 February 2004 letter *Strategy for Site Improvements, Foothill Sanitary Landfill*, from W. Michael Carroll, San Joaquin Co. DPW to K. Schwab, Central Valley Water Board.

and reports submitted/approved under CAO R5-2004-0706 for the Site Improvement Project, included, but were not limited to, the following:

- a. 31 August 2004 *Project Design Report for the Site Improvement Project*,
- b. 15 November 2004 *Partial Cover, Intermediate Cover, and Drainage and Erosion Control Plan*;
- c. 21 September 2004 *Landfill Closure Method Selection Report*;
- d. 30 January 2005 *Preliminary Closure and Postclosure Maintenance Plan*, prepared by Kleinfelder;
- e. March 2005 *Landfill Gas Collection and Control System Design Plan*, prepared by GC Environmental, Inc., prepared by Kleinfelder;
- f. 12 May 2005 *Module "I" Partial Final Closure Plan* (approved by Water Board staff on 18 July 2005) , prepared by Kleinfelder;
- g. 28 November 2005 *ET Cover Design Report for the Foothill Sanitary Landfill Site Improvement Project*, prepared by Kleinfelder; and
- h. 24 February 2007 *Final Construction Quality Assurance Report*, prepared by Vector Engineering.

The above *Final Construction Quality Assurance Report* for the project was approved by Water Board staff on 20 March 2007. The implementation of each component of the Site Improvement Project is described in Findings of this Order applicable to that aspect of the landfill design.

Landfill Gas Controls

98. The landfill gas (LFG) extraction system installed as part of the 2006 Site Improvement Project included the installation of 9 vertical extraction wells (GX-1 through GX-9) at Module I and 5 horizontal extraction wells (HC-1 through HC-5) at LF-2, Module 1. Each vertical extraction well was spaced about 500 feet apart for an estimated 250 foot radius of influence. The wells were completed to depths ranging from 41 to 100 feet depending on waste column thickness. Each horizontal well was designed for a 400 foot horizontal and 30 foot vertical radius of influence. Associated LFG collection and treatment facilities included lateral and header piping (3" HDPE and 12" HDPE); a condensate knock-out sump and a 1-inch diameter HDPE return line to Module 1's LCRS sump; two, 2,000 CFM blower motors; a flare station; and a 3.5 megawatt, 1,500 SCFM (standard cubic feet per minute) gas-to-energy plant.
99. The current landfill gas extraction rate at the site is approximately 1,200 SCFM. Since 2010, all LFG collected from the landfill has been piped to the gas-to-energy plant (in the southeast corner of the site), which is owned and operated by Ameresco under an agreement with the Discharger. Any remaining condensate is removed from the gas at the plant, and the methane gas is used to fuel a generator and create electricity which is exported for commercial use. Since start-up of the gas-to-energy plant, the LFG flare station has been inactive. See Finding 62 (Leachate and Condensate Management) and See Attachment E: Gas Controls & Monitoring.

Additional LFG collection facilities will be installed at the site, as necessary, to meet landfill development and corrective action needs. Existing LFG facilities within the planned landfill footprint, including the flare station and gas-to-energy plant, will be moved prior to initiating module construction in those areas.

100. Previous WDRs predated installation of the LFG system at the site and therefore did not require LFG extraction monitoring. Given that an LFG extraction system has since been installed at the site, the monitoring program in these WDRs requires that the Discharger conduct semiannual LFG extraction monitoring for parameters and constituents, including VOCs.
101. On 19 December 2014, in response to a 17 October 2014 email request by Central Valley Water Board staff, the Discharger submitted an amended EFS proposing the installation of additional LFG controls and monitoring wells at the landfill as part of the corrective action program to address VOC impacts to groundwater at the site. The amended EFS included a two-phase plan to address areas of the unit where LFG may be trapped and migrating toward groundwater, including the lower portion of the landfill waste column near MW-3 and under the HDPE barrier layer in the overlap area between LF-1 and LF-2.

Phase 1 of the plan would include the installation of 4 additional LFG extraction wells at LF-1, including two wells (GX-10 and 11) screened in the lower portion of the waste column in the western corner of the unit near MW-3 and two wells (GX-12 and 13) screened beneath the HDPE barrier layer in the LF-1/LF-2 overlap area. Existing LFG extraction wells would be vacuum-tested to estimate the radius of investigation for placement of the new wells. Five of the single probe soil gas monitoring wells along the northern and western perimeter of the unit (SG-2, -3, -4, -5 and -11) would be replaced with triple completion wells (SG-2A, -3A, -4A, -5A and -11A) to monitor the effectiveness of the extraction system in reducing VOC concentrations in soil gas. Phase 1 would also include unsaturated zone modelling using EPA's VLEACH software to evaluate LFG migration in the unsaturated zone and threshold concentrations of specific VOCs in soil gas that represent a threat to groundwater.

Based on the results of unsaturated zone modelling and gas probe monitoring data (at least one year), up to 8 additional gas extraction wells would be installed within the LF-1 area, as needed, as Phase 2 of the plan. Central Valley Water Board staff is currently reviewing the amended EFS, but the plan has not yet been approved.

CLOSURE AND POSTCLOSURE MAINTENANCE

102. The Title 27 prescriptive standard for landfill final cover includes the following components, from top to bottom:
 - a. Erosion Resistant Layer -- at least one foot of vegetative cover soil;
 - b. Barrier Layer (compositely-lined landfills only) – Geomembrane equivalent to geomembrane in composite base liner.
 - c. Low Hydraulic Conductivity (LHC) Layer -- Minimum one foot of compacted clay

soil with a permeability less than or equal to the lesser of 1×10^{-6} cm/s or the permeability of underlying clay soil liner or natural geologic materials, as applicable;

- d. Foundation Layer - at least two feet of materials (soil and/or waste) with appropriate engineering properties to support the overlying cover.

In lieu of the prescriptive cover design, the Discharger may construct an EAD provided that it meets the requisite demonstration under Title 27, section 20080(a). See Finding 74 (Footnote No. 9).

LF-1

103. In May 2005, the Discharger submitted a Partial Final Closure and Postclosure Maintenance Plan for Module I as required under the CAO R5-2004-0706 as part of the Site Improvement Plan (see Finding 97.f). The plan proposed installation of a 4.5-foot thick evapotranspirative (ET) cover on the top deck of Module I as a corrective action measure under the CAO R5-2004-0706. Water Board staff subsequently approved the design report on the condition that the Discharger conduct a 5-year demonstration project to show that the ET cover qualified as an EAD under Title 27, section 20080(b). A test pad was constructed on the top deck and monitored for various parameters for five consecutive wet seasons (2008-2009 through 2012-2013). Monitoring results were submitted in annual assessment reports.

In a 11 July 2014 letter, Water Board staff acknowledged that the Discharger had adequately demonstrated that the ET cover met or exceeded Title 27 standards and that the landfill had been partially closed in accordance with the CAO R5-2004-0706. A description of the demonstration test pad and monitoring results is provided in the Information Sheet attached to this Order.

104. Given that LF-1 does not have a Class III base liner (see Finding 21) and is no longer authorized to accept new wastes for disposal (see Discharge Prohibition A.2), these WDRs require that the remainder of LF-1 (i.e., all slopes outside of the closed top deck) be closed in accordance with a Partial FC/PCMP submitted under this Order, as approved by Central Valley Water Board staff. The Partial FC/PCMP is due by 15 October 2016 and LF-1 is required to be completely closed no later than 15 October 2018. For LF-1 side slopes overlapped by LF-2 as the landfill is developed, these WDRs allow the Discharger to propose a single containment system that functions as both LF-1 final cover and LF-2 side slope liner, provided that Title 27 performance standards are met. See Closure and Postclosure Specifications E.1 and E.2 and Construction Specification D.5.b.3).

LF-2

105. On 30 July 2010, the Discharger submitted a revised Preliminary Closure and Postclosure Maintenance Plan (PC/PCMP) with conceptual plans for closure of LF-1, Module I and the 10 planned LF-2 expansion modules as a single waste

management unit.¹³ The plan scope consisted mostly of closing LF-2, given that at closure, LF-2 would completely encircle LF-1, Module I's closed top deck, less the thickness of final cover soil to be applied. Proposed landfill closure activities would include grading and final cover installation; modifications and improvements to the landfill's monitoring systems and LFG control facilities; and various site improvements associated with landfill closure (e.g., drainage controls, demolition/decommissioning, survey monuments, site security).

106. The plan anticipated installation of a 4.5 foot thick ET cover over LF-2 similar to that installed on LF-1's top deck in 2006, utilizing existing intermediate cover soil. For preliminary planning purposes, the proposed ET cover would likely rely on the test pad demonstration conducted at LF-1 for its EAD demonstration. The closed landfill (i.e., LF-1 and LF-2) would be approximately square-shaped with a maximum final cover elevation of 432 feet MSL occurring along the spine of a boot-shaped top deck. Proposed final cover side slope grades (3.4H:1V) and setback from the site perimeter (200 feet) would generally be the same as the interim cover slopes of completed modules. The top deck would be graded to drain at a 6 % slope toward grass-lined cover drains along the flanks of the unit that discharge to overside drains. Grass-lined bench drains would collect sheet flow runoff from the landfill side slopes and direct it to the overside drains. The overside drains would discharge to a series of large (12 foot wide) drainage ditches connected to elongated storm water detention basins (100' wide x 500' long) along the perimeter of the unit to reduce peak flow discharges. The perimeter drainage system would discharge to the large storm water (i.e., stock) pond in the southeast corner of the site.
107. The 30 July 2010 PC/PCMP did not include final cover slope stability analysis because none of the proposed final cover slopes are steeper than 3H:1V and a geosynthetic component is not being proposed as a component of the cover. See Standard Closure and Postclosure Specification G.14, SPRR. Also, limited global slope stability analysis conducted for the design of LF-2's containment system indicated that final cover slopes with an ET final cover would likely be stable in accordance with the requirements of Title 27. See Finding 78.c.
108. The 30 July 2010 PC/PCMP did not include a specific plan for partial/phased landfill closure; however, it indicated that the landfill would likely be closed in phases. Phased closure would proceed once a sufficient number of adjacent expansion modules had been developed to constitute a closable phase. The first closure phase would not likely begin before the year 2024, however. These WDRs require that the Discharger partially close LF-2, as feasible as the landfill is developed, per Title 27 requirements. See Closure and Postclosure Specification E.4.

13. See 30 July 2010 *Preliminary Closure and Postclosure Maintenance Plan, Foothill Sanitary Landfill, San Joaquin County*, prepared by Shaw Environmental, Inc. (Appendix B, JTD).

109. Closure and Postclosure Specification E.3 requires that the Discharger submit a revised PC/PCMP for LF-2 only consistent with the requirements of this Order, including, but not limited to, the requirement for separate, prior closure of LF-1; a preliminary plan for partial/phased LF-2 closure; the need for a preliminary demonstration under Title 27, section 20080(b) if an EAD final cover (e.g., ET cover) is proposed; and revised financial assurance cost estimates, as necessary. See also Provision H.10.
110. Pursuant to Title 27, section 21090(e)(1), this Order requires a survey of the final cover following closure activities for later comparison with iso-settlement surveys required to be conducted every five years.
111. This Order final closure and post-closure maintenance plans, design documents, and CQA plan be submitted for review and approval at least 180 days prior to actual closure.
112. Landfill postclosure maintenance and monitoring activities will include final cover maintenance; leachate management; maintenance and monitoring of LFG facilities; groundwater, vadose zone, and surface water monitoring; maintenance of precipitation and drainage controls; and other postclosure related activities. The PC/PCMP includes optional plans (depending on circumstances and subject to agency approvals) to develop the area where the large storm water pond is located in the southeast corner of the site and to move the LFG flare station and related facilities onto the landfill final cover surface after closure.
113. Once every five years during the post-closure maintenance period, aerial photographic maps of the closed landfill area will be made to identify and evaluate landfill settlement. Iso-settlement maps will be prepared to determine the amount of differential settlement occurring over the previous five years. Pursuant to Title 27, section 21090(e)(2), this Order requires iso-settlement maps to be prepared and submitted every five years.
114. The completed final cover will be periodically tested for damage or defects by monitoring surface emissions pursuant to California Code of Regulations, title 17, section 95471(c) and Title 27, section 21090(a)(4)(A). Defects will be repaired and tested for adequacy based on the closure CQA Plan.

FINANCIAL ASSURANCES

115. The Discharger is required to demonstrate financial assurances for closure and postclosure maintenance to the California Department of Resources Recycling and Recovery (CalRecycle) pursuant to Title 27, sections 22205 and 22210 (i.e., the landfill operated on or after January 1, 1988). See also Standard Financial Assurance Provision H.1, SPRR.

116. Title 27, sections 21820 and 22206 require a cost estimate for landfill closure. The cost estimate must be equal to the cost of closing the landfill at the point in its active life when the extent and manner of operation would make closure the most expensive. When closing units in phases, the estimate may account for closing only the maximum area or unit of a landfill open at any time. The 30 July 2010 PC/PCMP provided a lump sum cost estimate for closure of the entire landfill (i.e., the largest future area needing closure at any one time absent phased closure) consistent with Title 27, section 21820(a)(1)(b). The total estimated cost of landfill closure, including 20% contingency, was \$26,651,400 in 2010 dollars. These WDRs require that the Discharger submit revised closure cost estimates consistent with the requirements of this Order (e.g., separate, prior closure of LF-1; phased closure of LF-2). See Closure and Postclosure Specification E.3.c.
117. Title 27 requires that the Discharger provide and maintain financial assurances to CalRecycle in at least the amount of the closure cost estimate (i.e., in the currently approved PC/PCMP submitted under previous WDRs or this Order), as annually adjusted for inflation. See Financial Assurances Specification. The Discharger has established an enterprise fund account (San Joaquin County Resolution No. 90-1190) funded from solid waste revenues as the financial assurances mechanism for landfill closure financial assurances per Title 27, section 22228. As of 2014, the balance of the closure fund was \$3,360,455.
118. Title 27, sections 21840 and 22211 require a cost estimate for landfill post-closure maintenance. The Discharger's 30 July 2010 PC/PCMP included a cost estimate for landfill post-closure maintenance. The total estimated annual cost for postclosure maintenance and monitoring provided in the PC/PCMP, including 20% contingency, was \$1,443,100 in 2010 dollars. The corresponding 30-year cost was \$43,293,000 in 2010 dollars. See Finding 112. This Order requires that the Discharger maintain financial assurance with CalRecycle in at least the amount of the post-closure maintenance cost estimate adjusted annually for inflation. As of 2014, the balance of the post-closure maintenance fund was \$1,845,158. In 1994, CalRecycle approved a Pledge of Revenue Agreement (Resolution No. 94-1137) proposed by the Discharger per title 27, section 22228 as the postclosure financial assurances mechanism for the site. This agreement is still in effect.
119. Title 27, section 22221 requires a cost estimate for corrective action of all known or reasonably foreseeable releases. In a 20 October 2008 letter, Central Valley Water Board staff approved a 30 September 2008 cost estimate of \$1,677,090 in 2008 dollars submitted by the Discharger for corrective action of all known or reasonably foreseeable releases at the landfill. The approved cost estimate included the costs of installing four deep landfill gas extraction wells extending to the base of LF-1 to address a hypothetical gas release at unlined Module I (i.e., LF-1). On 30 January 2009, CalRecycle approved a Pledge of Revenue Agreement (Resolution R-08-686) per Title 27, section 22245 as the mechanism for corrective action financial assurances the site. This Order requires that the Discharger maintain financial

assurance with the CalRecycle in at least the amount of this cost estimate, as adjusted annually for inflation. As of 2014, the balance of the corrective action fund was \$61,607.

CEQA AND OTHER CONSIDERATIONS

120. The action to revise waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality Act (CEQA), Public Resource Code section 21000, et seq., and the CEQA guidelines, in accordance with Title 14, section 15301.
121. This Order implements:
- a. *The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition;*
 - b. The prescriptive standards and performance goals of California Code of Regulations, title 27, section 20005 et seq., effective 18 July 1997, and subsequent revisions;
 - c. State Water Board Resolution 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*, adopted 17 June 1993, and revised on 21 July 2005.
 - d. The applicable provisions of Title 40 C.F.R. section 258 "Subtitle D" federal regulations as required by State Water Board Resolution 93-62.
122. Facilities under WDRs are classified for the purposes of determining the annual permit fee and WDR update cycle. These classifications are based on threat to water quality and complexity associated with the discharge. The Foothill Landfill was classified as a "1B" discharge under previous WDRs Order R5-2003-0020. These revised WDRs maintain the "1B" designation. The following fee criteria were used:

Threat to Water Quality:

Category "1" – "Those discharges of waste that could cause the long-term loss of a designated beneficial use of the receiving water. Examples of long-term loss of a beneficial use include the loss of drinking water supply, the closure of an area used for water contact recreation, or the posting of an area used for spawning or growth of aquatic resources, including shellfish and migratory fish."

Complexity:

Category "B" – "Any discharger not included in Category A that has physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal), or any Class 2 or Class 3 waste management units."

The WDR update cycle for 1B discharges is 5 years from the date of adoption of the WDRs, or, if granted a continuance by the Executive Officer, from the continuance date. The WDR fee schedule may be found on the Central Valley Water Board's website at:

http://www.waterboards.ca.gov/resources/fees/docs/fy1415_wdr_fees.pdf

123. Water Code Section 13267(b) provides that: "In conducting an investigation specified in subdivision (a), the Central Valley Water Board may require that any person who has discharged, discharges, or is suspected of discharging, or who proposed to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who had discharged, discharges, or is suspected of discharging, or who proposed to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Central Valley Water Board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports."
124. The technical reports required by this Order and the attached "Monitoring and Reporting Program No. R5-2015-0058" are necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.

PROCEDURAL REQUIREMENTS

125. All local agencies with jurisdiction to regulate land use, solid waste disposal, air pollution, and to protect public health have approved the use of this site for the discharges of waste to land stated herein.
126. The Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
127. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.
128. Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of the Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:
http://www.waterboards.ca.gov/public_notices/petitions/water_quality
or will be provided upon request.

IT IS HEREBY ORDERED, pursuant to Sections 13263 and 13267 of the California Water Code, that Order R5-2003-0020 is rescinded, except for purposes of enforcement, and that the San Joaquin County Department of Public Works and Foothill Sanitary Landfill, Inc.,

their agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted there under, shall comply with the following:

A. DISCHARGE PROHIBITIONS

1. The discharge of 'hazardous' or 'designated' waste, as defined under Title 27, section 20164, to the landfill unit is prohibited.
2. The discharge of new or additional waste to LF-1 is prohibited, except as follows:
 - a. The discharge of inert wastes (see Title 27, section 20230), or relocation of existing wastes, within the landfill unit consistent with the revised Partial FCP/PCMP submitted under this Order to establish the final cover grade prior to completing closure of the unit;
 - b. The beneficial reuse of inert materials in final cover construction/repair (e.g., foundation layer, side slope buttresses, berms) consistent with Discharge Specification B.8;
 - c. The stockpiling of inert materials for beneficial reuse described above; and
 - d. The beneficial reuse of inert liquids for construction or maintenance purposes consistent with Discharge Specification B.8.c.
3. The following discharges of leachate and/or landfill gas condensate are prohibited:
 - a. The return or discharge of leachate and/or LFG condensate to unlined unit LF-1;
 - b. The discharge of LF-1 leachate and/or LFG condensate to LF-2 after **15 October 2016** (see Discharge Specification B.6);
 - c. The return or discharge of leachate and/or LFG condensate to closed units or closed portions of units; and
 - d. The use of leachate and/or LFG condensate for dust control.
See 40 CFR 258.28(a)(2) and Title 27, sections 20090(e)(2), 20200(d) and 20340(g).
4. The Discharger shall comply with all Standard Prohibitions listed in Section C of the Standard Provisions and Reporting Requirements (SPRRs) incorporated into this Order under Finding 2.

B. DISCHARGE SPECIFICATIONS

1. The Discharger shall only discharge the wastes listed or allowed under the Waste Classification and Unit Classification section in the Findings of this Order.

2. The Discharger is not authorized to use any material as alternative daily cover (ADC) other than tarps unless and until the Discharger has demonstrated that a proposed ADC meets the requirements in Title 27, section 20705, and the Discharger has received written approval by the Executive Officer that it may begin using the material as ADC.
3. The Discharger shall use approved ADC only in internal areas of the landfill that do not drain outside of the limits of the contiguous landfill units unless the Discharger demonstrates that runoff from the particular ADC is not a threat to surface water quality and the demonstration has been approved in writing. This demonstration may take removal of sediment or suspended solids into account for landfills where surface water drains to a sedimentation basin.
4. If any waste is discharged at this facility in violation of this Order, the Discharger shall timely report such unauthorized discharge to the Central Valley Water Board and relocate the waste for proper disposal. If the Discharger is unable to remove and relocate the waste, the Discharger shall submit a report to the Water Board explaining how the discharge occurred, why the waste cannot be removed, and any updates to the waste acceptance program necessary to prevent re-occurrence. If the waste is a hazardous waste, the Discharger shall immediately notify the Department of Toxic Substances Control.
5. Leachate and landfill gas condensate may be returned/discharged only to active LF-2 modules constructed and operated in accordance with this Order and only if consistent with Discharge Prohibition A.3.
6. After **15 October 2016**, leachate and LFG condensate derived from LF-1 shall be discharged at an authorized offsite facility or appropriately handled for such discharge (e.g., stored in tanks pending pick-up). See Facility Specification C.2.
7. The discharge of dewatered sewage, septage, and/or water treatment sludge shall be limited to active LF-2 modules constructed and operated in accordance with this Order, including, but not necessarily limited to, Construction Specifications D.1 through D.4 and SPRR, Standard Prohibition C.1.b.
8. The beneficial reuse of wastes at LF-1 per Discharge Prohibition A.2.b shall be subject to the following restrictions:
 - a. Inert wastes used in construction or repair of landfill final cover shall meet the project specifications contained in the approved construction documents described in, or submitted under, this Order and shall be applied consistent with the revised Partial FC/PCMP submitted under this Order. See Construction Specifications D.7 and D.9.
 - b. Only clean soil (i.e., soil not containing any waste) may be used in the construction/repair of the ET cover; the erosion resistant and low hydraulic

conductivity layers of prescriptive cover; cover berms and drains; side slope benches; landfill buttresses, and detention basin walls.

- c. Inert liquids (i.e., groundwater, surface water, or storm water) may be applied to landfill prescriptive or ET final cover for construction or maintenance purposes (e.g., dust control, limited irrigation of vegetative cover) consistent with Title 27, section 21090(a)(5)(B).

- 9. The Discharger shall comply with all Standard Discharge Specifications listed in Section D of the SPRRs.

C. FACILITY SPECIFICATIONS

- 1. Consistent with Discharge Prohibition A.3, LFG extracted from LF-1 shall be routed through a condensate knock-out sump prior to being commingled with LF-2 LFG, if condensate removed from LF-2 LFG is to be returned to LF-2.
- 2. Per Title 27, section 21760(b), the Discharger shall develop and implement an operations and maintenance (O&M) plan for the LFG extraction system, as approved by Central Valley Water Board staff, to ensure that LFG from the landfill units is controlled and handled appropriately in accordance with the requirements of this Order and Title 27 regulations. The plan shall include, but not be limited to, a plan for the separate removal and offsite disposal of LFG condensate from LF-1 per Discharge Specification B.6 above. See also Provision H.8.
- 3. The Discharger shall comply with all Standard Facility Specifications listed in Section E of the SPRRs dated January 2012 which are part of this Order.

D. CONSTRUCTION SPECIFICATIONS

Liner

- 1. LF-2 expansion modules shall, at a minimum, be constructed in accordance with the following engineered alternative design (EAD), from top to bottom:¹⁴

<u>Component</u>	<u>Base Liner</u>	<u>Side Slopes</u>	
		<u>Excavation</u>	<u>LF-1/LF-2 Interface</u>
Operations Layer	≥ 2 feet soil		
Filter Fabric	Geotextile ¹	Geocomposite ²	
LCRS	9-inch gravel layer		
	Appropriately-sized HDPE collection piping in drainage troughs		

¹⁴. Incorporates EAD approved under previous WDRs and Title 27 containment system requirements for side slope extensions overlapping an existing MSW landfill (i.e., LF-1).

Base Liner	60-mil HDPE ³	None ⁴
	Geosynthetic Clay Liner (GCL) ^{5,6}	
Foundation Layer	≥ 1 foot prepared subgrade ⁷	

1. Geotextile consists of 8 oz/yd² non-woven fabric.
2. Geonet with geotextile on at least one side.
3. HDPE textured on at least one side.
4. Additional containment components (e.g., synthetic barrier layer) shall be installed if (and to the extent) required under an approved corrective action program submitted under these WDRs and/or separate Central Valley Water Board order (e.g., CAO R5-2004-0706).
5. GCL shall exhibit appropriate strength characteristics (hydrated) to accommodate stresses associated with specific landfill design parameters, with particular attention to interface, long-term creep, shear, and bearing capacity.
6. May alternatively be constructed with a Title 27 prescriptive clay liner. See Title 27, section 20330(a).
7. See Construction Specification D.2.

2. The foundation layer in the above composite liner design (D.1) shall be constructed as follows:
 - a. Project CQA shall include both preparation of the foundation surface so as to minimize the risk of liner puncture, and leak detection testing. The foundation layer shall consist of select fine-grained soil materials compacted as follows:
 - 1) In lifts of 6 inches or less; and
 - 2) To at least 90% of maximum dry density per moisture content specification in approved CQA plan; and
 - 3) To a minimum hydraulic conductivity of 1×10^{-5} cm/sec; or
 - 4) In accordance with the following gradation criteria:
 - i. A maximum size of 3/8-inch; and
 - ii. At least 30% of the material, by dry weight, passing the No. 200 U.S. Standard sieve.
 - b. The subgrade for the bottom and side slopes (including LF-1/LF-2 interface areas) shall be prepared in an appropriate manner using accepted engineering and construction methods so as to provide a smooth surface free from rocks, sticks, or other debris that could damage or otherwise limit the performance of the GCL.

LCRS

3. The LCRS for LF-2 expansion modules shall, at a minimum, be constructed in accordance with the following, from top to bottom:
 - a. Blanket Drainage Layer –
 - 1) Minimum 9-inches thick layer of sufficiently rounded or cushioned drainage gravel over base liner
 - 2) Geocomposite (or equivalent combination of geonet and filter fabric) over side slopes, including LF-1/LF-2 interface areas.

b. Collection Piping

- 1) Perforated HDPE laterals installed in collection troughs (or directly on base liner) and plumbed to header pipe(s) or directly to an LCRS sump (e.g., depending on module design/geometry). Laterals shall be equipped with pipe risers to allow for video camera inspection (by wire rope or robot) and cleaning, as necessary.
- 2) As warranted, based on module design/geometry, HDPE header pipe plumbed to LCRS sump.

c. Collection Troughs – graded toward header or LCRS sump.

4. The LCRS sump shall be constructed consistent with the approved designs for Module 1 or Module 2, as follows, from top to bottom:

<u>Component</u>		<u>Specification</u>
Filter Fabric		Geotextile ²
Sump ^{1,3}	Gravel	Sump gravel
	Depth	≥ 4 feet
	Pump	Automatic with high and low alarms, flow meter
Cushion		Geotextile ²
Primary Composite Liner		60-mil HDPE/GCL
Secondary LCRS ³		Geonet
Secondary Composite Liner		60-mil HDPE/GCL
Foundation Layer		≥ 1 foot compacted subgrade

1. Sump shall be equipped with an automatic pump, flow meter, and recording device, allowing instantaneous measurement of rate and volumes removed. High and low liquid level sensors and associated alarms shall also be included in design.
2. 8 oz/yd² non-woven fabric.
3. Design shall include appropriately-sized HDPE riser pipes for leachate monitoring and removal.

Final Cover

5. Final cover installed over the remainder of partially-closed LF-1 shall, at a minimum, be constructed in accordance with one of the following designs consistent with the Partial FCP submitted under this Order, as approved:

a. Title 27 Prescriptive Standard, from top to bottom:

<u>Component</u>	<u>Side Slopes</u>	
	<u>Exterior</u>	<u>LF-1/LF-2 Interface</u>
Erosion Resistant Layer	≥ 2 feet vegetative cover soil	
Low Hydraulic Conductivity (LHC) Layer	≥ 1 foot compacted clay soil ($k \leq 1 \times 10^{-6}$ cm/sec) ¹	

Foundation Layer	≥ 2 feet soil or appropriate waste materials ²
------------------	---

1. Minimum relative compaction of 90%.
2. See Construction Specification D.2.

b. One or more of the following Title 27 Engineered Alternative Designs (EADs), as applicable, from top to bottom:

1) GCL

<u>Component</u>	<u>Side Slopes</u>	
	<u>Exterior</u>	<u>LF-1/LF-2 Interface</u>
Erosion Resistant Layer	≥ 2 feet vegetative cover soil	
Low Hydraulic Conductivity (LHC) Layer	Geosynthetic Clay Liner (GCL) ¹	
Foundation Layer	≥ 2 feet soil or appropriate waste materials ²	

1. GCL shall exhibit appropriate strength characteristics (hydrated) to accommodate stresses associated with specific landfill design parameters, with particular attention to interface, long-term creep and shear.
2. See Construction Specification D.2.

2) ET Cover (Exterior side slopes only)

<u>Component</u>	<u>Side Slopes</u>	
	<u>Exterior</u>	<u>LF-1/LF-2 Interface</u>
Evapotranspirative Layer	≥ 3 feet soil	n/a ¹

1. ET cover not authorized in LF-2 underlap areas. Use GCL or prescriptive design.

3) Liner-Cover Combination System (LF-1/LF-2 interface areas only)

For LF-1/LF-2 interface areas only, a combined liner-cover that system that incorporates, but does not necessarily duplicate, elements specified above for LF-1/LF-2 interface liner (Construction Specification D.1) and final cover (Construction Specification D.5), provided that the combined containment system meets Title 27 performance standards for both final cover and Class III (non-composite) landfill liner.

The partial FC/PCMP shall include an appropriate EAD demonstration per Title 27, section 20080(b) for each of the above designs proposed. See Closure and Postclosure Maintenance Specification E.5.

6. The Discharger may propose changes to the liner/final cover system design prior to construction provided that approved components are not eliminated, the engineering properties of the components are not substantially reduced, and the

proposed liner/final cover system results in the protection of water quality equal to or greater than the design prescribed by Title 27 and this Order. The proposed changes may be made following approval by the Executive Officer. Substantive changes to the design require reevaluation as an engineered alternative and approval by the Central Valley Water Board in revised WDRs.

7. **At least 90 days** prior to initiation of any new landfill modules or closure construction activities under an FC/PCMP or Partial FC/PCMP, as approved by the Executive Officer, the Discharger shall submit for review and approval all applicable plans and reports, including, but not necessarily limited to, the following:
 - a. Any proposed design modifications pertaining to construction or closure of the unit, module, or phase per Construction Specification D.6.
 - b. A construction design report, including project specifications, drawings, grading and design plans; and
 - c. A Construction Quality Assurance (CQA) Plan which satisfies the requirements of Section 20324 of Title 27 as it applies to the construction of the erosion-resistant and foundation layers.

Closure construction shall proceed only after the above (and any other applicable) reports have been approved by Executive Officer. See also Standard Construction Specification F.1, SPRR.

8. LFG extraction facilities necessary to control LFG shall be installed as each new module is constructed and developed. New modules shall be tied into the existing LFG extraction system in order to help control LFG.
9. The Discharger shall comply with all Standard Construction Specifications listed in Section F of the SPRRs.
10. The Discharger shall comply with all Storm Water Provisions listed in Section L of the SPRRs.

E. CLOSURE AND POST-CLOSURE MAINTENANCE SPECIFICATIONS

LF-1

1. By **15 October 2016**, the Discharger shall submit a revised Partial FC/PCMP for closure the remainder of LF-1 consistent with the construction specifications (e.g., Construction Specification D.5) and other applicable requirements of this Order. The revised Partial FC/PCMP shall include plans for closure of all portions of the unit that have not yet been closed (e.g., side slopes), and include a description of closure activities, a schedule, and all other information required under Title 27, section 21769(c). See Finding 104, Closure and Postclosure Specification E.2, Provision H.9.b and Standard Closure and Postclosure Specification G.8.

2. By **15 November 2018**, the Discharger shall complete closure of unlined unit LF-1 (i.e., Module I) and within 30 days thereafter submit a certification that the landfill has been closed consistent with Standard Closure and Postclosure Specification G.23, SPRR and Provision H.9.d of this Order.

LF-2

3. By **15 March 2017**, the Discharger submit a revised PC/PCMP for LF-2 consistent with the revised Partial FC/PCMP submitted under these WDRs for LF-1, as approved by the Executive Officer, and all other requirements of this Order and Title 27, section 21769(b). The revised PC/PCMP shall include, but not be limited to, the following:
 - a. A preliminary plan and timeline for partial/phased landfill closure;
 - b. A preliminary demonstration under Title 27, section 20080(b) for an EAD final cover, if an EAD final cover is being proposed (see Closure and Postclosure Specification E.5); and
 - c. Revised closure and postclosure financial assurance cost estimates, as appropriate.

See Provision H.10 and Closure and Postclosure Specification E.4 below.

4. The operator shall to the extent feasible, based on site specific factors, implement partial and/or partial final closure activities as the site operation progresses, consistent with the closure of the entire site. See Title 27, section 21120(a).

Both Units

5. Landfill final cover designs proposed in preliminary or final closure plans submitted under this Order shall be consistent with the prescriptive standard or engineered alternative design (EAD) options specified in Finding 102 and Construction Specification D.5. Any proposal for an EAD final cover included in a FCP or Partial FCP shall be accompanied by the requisite demonstration under Title 27, section 20080(b) and (c), including, but not limited to, a demonstration that construction of the prescriptive standard is infeasible and that the proposed EAD meets or exceeds Title 27 performance standards for final cover. Such demonstration may require a field pilot project or test pad.
6. Any proposal for final cover included in the FCP or Partial FCP for the landfill units shall meet the requirements of Title 27 and Subtitle D, including the requirement that the permeability of the LHC layer (or percolation rate through proposed ET cover) be no greater than that of the base liner or underlying natural geologic materials (whichever is less) in order to prevent a "bathtub effect". See Title 27, section 21090(a)(2) and 40 CFR 258.60(a)(1).
7. The Discharger shall obtain revised WDRs prior to closure with any other final cover design than the design or designs approved in this Order.

8. Closed or partially closed landfill unit side slopes shall be no steeper than 3H:1V, and closed top deck areas shall be sloped at three percent or greater.
9. The Discharger shall install and maintain an active landfill gas extraction system appropriately sized to remove LFG from the closed landfill unit throughout the postclosure period. Landfill gas shall be extracted from closed landfill units until such time that the landfill gas is no longer a threat to water quality as documented by the Discharger and approved by the Executive Officer.
10. For closure designs including geomembrane and/or GCL, the Discharger shall seal the edges of the final cover by connecting its components to the base liner, as necessary and feasible.
11. The Discharger shall test the critical interfaces of the final cover in a laboratory to ensure minimum design shear strengths are achieved and include the results in the final documentation report.
12. The Discharger shall ensure that the vegetative/erosion resistant layer receives necessary seed, binder, and nutrients to establish the vegetation proposed in the final closure plan. The Discharger shall install necessary erosion and sediment controls to prevent sediment in runoff from the closed landfill during the period the vegetation is being established.
13. The Discharger shall comply with all Standard Closure and Post-Closure Specifications listed in Section G and all Standard Construction Specifications that are applicable to closure in Section F of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.

F. FINANCIAL ASSURANCE SPECIFICATIONS

1. The Discharger shall obtain and maintain assurances of financial responsibility with CalRecycle for closure and post-closure maintenance of LF-2 in at least the amounts in the most recently approved PC/PCMP, as adjusted for inflation annually. A report regarding financial assurances for closure and post-closure maintenance shall be submitted to the Central Valley Water Board by **1 June of each year**. This may be the same report that is submitted to CalRecycle for this purpose. If CalRecycle determines that either the amount of coverage or the mechanism is inadequate, then within 90 days of notification, the Discharger shall submit an acceptable mechanism to CalRecycle and the Central Valley Water Board for at least the amount of the approved cost estimate.
2. The Discharger shall update the most recently approved PC/PCMP any time there is a change that will increase the amount of the closure and/or post-closure maintenance cost estimate. The updated PCPCMP shall be submitted to the Central Valley Water Board, the Local Enforcement Agency, and CalRecycle. The PC/PCMP shall meet the requirements of Title 27, section 21769(b), and

include a lump sum estimate of the cost of carrying out all actions necessary to close each Unit, to prepare detailed design specifications, to develop the final closure and post-closure maintenance plan, and to carry out the first thirty years of post-closure maintenance. Reports regarding financial assurance required in Financial Assurances Specification F.1 above shall reflect the updated cost estimate.

3. The Discharger shall obtain and maintain assurances of financial responsibility with CalRecycle for initiating and completing corrective action for all known or reasonably foreseeable releases from the landfill in at least the amount of the annual inflation-adjusted cost estimate described in Finding 119. A report regarding financial assurances for corrective action shall be submitted to the Central Valley Water Board by **1 June of each year**. This may be the same report that is submitted to CalRecycle for this purpose. If CalRecycle determines that either the amount of coverage or the mechanism is inadequate, then within 90 days of notification, the Discharger shall submit an acceptable mechanism to CalRecycle and the Central Valley Water Board for at least the amount of the approved cost estimate.
4. The Discharger shall comply with all Standard Financial Assurance Specifications listed in Section H of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.

G. MONITORING SPECIFICATIONS

1. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, and in accordance with Monitoring and Reporting Program (MRP) R5-2015-0058, and the Standard Monitoring Specifications listed in Section I of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.
2. The Discharger shall, for any landfill unit in a corrective action monitoring program, comply with the corrective action monitoring program provisions of Title 27, MRP R5-2015-0058, and the Standard Monitoring Specifications listed in Section I of SPRRs dated January 2012.
3. The Discharger shall comply with the Water Quality Protection Standard specified in the Water Quality Protection Standard Report submitted under Provision H.7 of this Order, as approved.
4. The concentrations of the constituents of concern in waters passing the Point of Compliance (defined pursuant to Title 27, section 20164 as a vertical surface located at the hydraulically downgradient limit of the landfill unit that extends through the uppermost aquifer underlying the unit) shall not exceed the concentration limits established pursuant to MRP R5-2015-0058.

5. For each monitoring event, the Discharger shall determine whether the landfill is in compliance with the Water Quality Protection Standard using procedures specified in MRP R5-2015-0058 and the Standard Monitoring Specifications in Section I of the SPRRs dated January 2012.
6. In the event of a release, the data analysis methods shall also include trend analysis; an evaluation of the water chemistry; and preparation of contaminant contour plots to monitor the nature of the release and effectiveness of corrective action measures, as specified in the MRP.
7. Prior to termination of corrective action measures required under Section 20430(c), the discharger shall demonstrate, pursuant to Section 20430(f), and 40 CFR 258.58(e)(2) for an MSW landfill, that the constituents of the release have been reduced to levels below concentration limits throughout the entire zone affected by the release. During this "proof period", the Discharger shall demonstrate that:
 - a. The concentration of each constituent in each sample from each monitoring point remained at or below its concentration limit for at least **four** years, beginning immediately after the suspension of corrective action measures;
 - b. The individual sampling events for each monitoring point must have been evenly distributed throughout the proof period and have consisted of at least two sampling events per year (i.e., one each semester) per monitoring point (i.e., quarterly monitoring); and
 - c. At the end of the proof period, a single data analysis method (statistical or nonstatistical, as appropriate) shall be used for each monitoring parameter at each monitoring point to determine whether that parameter has been reduced to levels at or below concentration limits at that monitoring point.

The Discharger shall notify the Board and obtain Executive Officer approval prior to (1) suspending corrective action measures prior to making the above demonstration; and (2) terminating corrective action measures after making the above demonstration.

8. Any proposal for concentration limits greater than background (CLGBs) shall be accompanied by the requisite demonstration under Section 20400(c) (i.e., that it is technologically or economically infeasible to achieve the background value for that constituent and that the constituent will not pose a substantial present or potential hazard to human health or the environment). Approval of CLGBs shall require approval of revised WDRs by the Central Valley Water Board.
9. The Discharger shall comply with all Standard Monitoring Specifications and Response to a Release specifications listed in Sections I and J of the SPRRs dated January 2012.

H. PROVISIONS

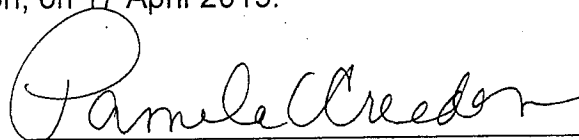
1. The Discharger shall maintain a copy of this Order at the facility, including the MRP R5-2015-0058 and the SPRRs dated January 2012 which are part of this Order, and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.
2. The Discharger shall comply with all applicable provisions of Title 27 and Subtitle D that are not specifically referred to in this Order.
3. The Discharger shall comply with MRP R5-2015-0058, which is incorporated into and made part of this Order by reference.
4. The Discharger shall comply with the applicable portions of the Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Subtitle D and/or Title 27, dated January 2012.
5. If there is any conflicting or contradictory language between the WDRs, the MRP, or the SPRRs, then language in the WDRs shall supersede either the MRP or the SPRRs, and language in the MRP shall supersede the SPRRs.
6. All reports required by this Order shall be submitted pursuant to Water Code section 13267.
7. By **31 January 2016**, the Discharger shall submit, for the Executive Officer's approval, a Water Quality Protection Standard (WQPS) Report describing the WQPS for each landfill unit at the site for each monitored media under this Order (i.e., unsaturated zone, groundwater, and surface water). The WQPS report shall specify Constituents of Concentration, Concentration Limits, Monitoring Points, Points of Compliance, and Compliance Periods, consistent with the requirements of this Order and Title 27 regulations. See Standard Monitoring Specification I.25 and MRP Section C.
8. By **15 January 2017**, the Discharger shall submit, for Board staff approval, an Operations and Maintenance (O&M) Plan for the LFG control system, to ensure that LFG extracted from the landfill units is handled and disposed of in accordance with the requirements of this Order and Title 27 regulations. See Discharge Prohibition A.3.b, Discharge Specification B.6, and Facility Specifications C.1 and C.2.
9. Pursuant to Section 13267 of the California Water Code, the Discharger shall submit the following technical reports relevant to completing closure of LF-1:

	Report	Due Date
a.	Closure Status Report (e.g., interested agency permitting/approvals; project schedule; site preparation and construction progress).	Quarterly beginning 15 November 2016
b.	A revised Partial Final Closure and Postclosure Maintenance Plan (Partial FC/PCMP) per Closure and Postclosure Maintenance Specification E.1.	15 October 2016
c.	Closure construction plans per Construction Specification D.7.	At least 90 days prior to initiation of closure construction
d.	Letter certifying completion of closure construction per Closure and Postclosure Maintenance Specification E.2.	15 December 2018
e.	Certification Report documenting completion of landfill closure per approved construction plans per Standard Closure and Postclosure Specification G.24, SPRR.	15 May 2019

All of the reports required above shall be prepared by a California-registered civil engineer or certified engineering geologist.

10. By **15 March 2017**, the Discharger shall submit a revised PC/PCMP for LF-2 consistent with the revised Partial FC/PCMP submitted under these WDRs for LF-1, as approved by the Executive Officer, and all other requirements of this Order and Title 27, section 21769(b). See Closure and Postclosure Specification E.3.
11. The Discharger shall comply with all General Provisions listed in Section K of the SPRRs dated January 2012 which are part of this Order.

I, PAMELA C. CREEDON, 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 17 April 2015.



PAMELA C. CREEDON, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2015-0058
FOR
SAN JOAQUIN COUNTY DEPARTMENT OF PUBLIC WORKS
FOOTHILL SANITARY LANDFILL, INC.
FOOTHILL LANDFILL
CLASS III LANDFILLS
CONSTRUCTION, OPERATION, CLOSURE, POST-CLOSURE
MAINTENANCE, AND CORRECTIVE ACTION
SAN JOAQUIN COUNTY

This monitoring and reporting program (MRP) is issued pursuant to California Water Code section 13267 and incorporates requirements for groundwater, surface water, and unsaturated zone monitoring and reporting; facility monitoring, maintenance, and reporting contained in California Code of Regulations, title 27, section 20005, et seq. (hereafter Title 27), Waste Discharge Requirements (WDRs) Order No. R5-2015-0058, and the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Subtitle D and/or Title 27* (SPRRs), dated January 2012. 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 monitor both landfill units at the site (i.e., Landfills 1 and 2) in accordance with the detection and corrective action monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone. Monitoring shall also be in accordance with the 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 an approved Sample Collection and Analysis Plan, which includes quality assurance/quality control standards. 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 this Monitoring and Reporting Program.

All compliance monitoring wells established for the detection and corrective action monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard. All detection and corrective action monitoring program 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 VI.

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 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>	<u>Reference Map</u> ¹
A.1	Groundwater Monitoring	Attachment C: Site Map
A.2	Unsaturated Zone Monitoring	
A.3	Leachate Monitoring, Seep Monitoring, and LCRS Testing	
A.4	Surface Water Monitoring	Attachment D: Drainage Controls & Monitoring
A.5	Solid Waste Monitoring	n/a
A.6	Facility Monitoring	
A.7	Additional Corrective Action Monitoring	Attachment E: Gas Controls & Monitoring

1. See reference map for monitoring locations.

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.

The Discharger contiguously monitors both landfill units at the site (i.e., LF-1 and LF-2) in accordance with Title 27, section 20415(e)(3). LF-1 is in corrective action monitoring and LF-2 is in detection monitoring. This groundwater monitoring system meets the applicable requirements of Title 27. The Discharger shall revise the groundwater monitoring system (after review and approval by Central Valley Water Board staff) as needed each time a new landfill module is constructed or for corrective action monitoring.

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

<u>Well</u>	<u>Program</u>	<u>Location</u>	<u>Zone</u>	<u>Unit(s) Monitored</u>
MW-4 ¹	Detection & Corrective Action	Upgradient	Upper	LF-1 and LF-2
MW-3		Downgradient / Sidegradient		LF-1
MW-2R				LF-2
MW-5 ²		Downgradient	Upper & Lower	LF-1 and LF-2
MW-6 ²				

1. Well used for development of concentration limits.

2. Corrective action monitoring well for LF-1 and detection monitoring well for LF-2.

The groundwater monitoring network for the Foothill Landfill shall also include any future wells installed by the Discharger under these WDRs to monitor LF-1 and/or LF-2.

b. Monitoring Schedule

Monitoring at each unit shall include field parameter testing and groundwater sampling. Groundwater samples shall be collected and analyzed in accordance with the following schedule using the applicable test methods for each constituent listed in Appendix 1 attached to this Order.

Table A.1.b Groundwater Monitoring Schedule			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<i>Field Parameters</i>			
Groundwater Elevation	Feet & 100ths, M.S.L.	Quarterly	Semiannually
Temperature	oF	Semiannually	Semiannually
Specific Conductance	umhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
Turbidity	NTU	Semiannually	Semiannually
<i>Monitoring Parameters</i>			
Bicarbonate Alkalinity	mg/L	Semiannually	Semiannually
Calcium	mg/L		
Carbonate	mg/L	Semiannually	Semiannually
Chloride	mg/L	Semiannually	Semiannually
Magnesium	mg/L		
Nitrate as N	mg/L	Semiannually	Semiannually
Potassium	mg/L	Semiannually	Semiannually
Sodium	mg/L		
Sulfate	mg/L	Semiannually	Semiannually
Total Dissolved Solids	mg/L	Semiannually	Semiannually
Dissolved Iron	ug/L	Semiannually	Semiannually
Volatile Organic Compounds (VOCs) ¹	ug/L	Semiannually	Semiannually
<i>Constituents of Concern</i> ¹	---	Every 5 years	Every 5 years

1. See Appendix 1 for COCs and analytical methods.

Once per quarter, the Discharger shall measure the groundwater elevation in each well, 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. 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 at least semiannually in all wells, including any future wells added as part of the approved groundwater monitoring system.

The Discharger shall collect, preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan. 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).

Samples collected for the COC monitoring specified in Appendix 1 shall be collected and analyzed in accordance with the methods listed in Table VI every five years. Five-year COCs were last monitored in 2014 and shall be monitored again in 2019. The results shall be reported in the Annual Monitoring Report for the year in which the samples were collected.

Background, detection, and corrective action monitoring data analysis shall be conducted consistent with the statistical and non-statistical data analysis methods described in Section C.1, as updated in the Water Quality Protection Standard Report submitted under WDR Provision H.7, as approved by the Executive Officer.

2. Unsaturated Zone Monitoring

The Discharger shall operate and maintain an unsaturated zone detection and corrective action monitoring system that complies with the applicable provisions of Title 27, sections 20415 and 20420. Unsaturated zone monitoring shall consist of soil pore gas monitoring and lysimeter monitoring. The current unsaturated zone detection monitoring system at the site meets Title 27 requirements. The Discharger shall install unsaturated zone monitoring devices (after review and approval by Central Valley Water Board staff) each time the landfill constructs a new cell or module.

a. Soil Pore Water Monitoring

i. Monitoring Points (See Attachment C: Site Map)

The soil pore water monitoring shall consist of all lysimeters installed beneath current and future LF-2 modules or module phases, as follows:

Table A.2.a.i Soil Pore Water Monitoring Points				
<u>LF-2 Module</u>	<u>Lysimeter</u>	<u>Type</u>	<u>Program</u>	<u>Location</u>
M-1	LZ-1	Suction	Background	Near northeast site boundary
	LZ-2	Suction	Detection	Beneath LCRS sump
	LZ-3	Suction		Beneath northeast LCRS trench
	LZ-4	Suction		Beneath southwest corner of liner
M-2A ¹	LZ-5	Pan		Beneath LCRS sump(s) ²
Future Modules/ Phases	----	Pan ³		

1. Module 2, Phase A scheduled for construction in spring, 2015.
2. Additional lysimeter locations may be included in future module designs.
3. Future modules/phases shall be equipped with pan lysimeters rather than suction lysimeters.

ii. Monitoring Schedule

Moisture block sensors for suction lysimeters (i.e., LZ-1 through LZ-4 above) shall be checked and repaired as necessary as part of facility monitoring to ensure they are in good working order. Sampling shall be attempted at any suction lysimeter where the moisture block resistivity reading indicates there is pore fluid. Soil-pore water samples shall be collected from the pan lysimeters (i.e., LZ-5 and lysimeters in future modules/phases) and analyzed in accordance with the following schedule using the applicable test methods for each constituent listed in Appendix 1 attached to this Order.

Table A.2.a.ii Soil Pore Water Monitoring Schedule			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<i>Field Parameters</i>			
Presence of leachate/liquid	---	Monthly	Semiannually
Specific Conductance	umhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
Volume of liquid removed	gallons	Monthly	Semiannually
<i>Monitoring Parameters</i>			
Bicarbonate Alkalinity	mg/L	Semiannually	Semiannually
Calcium	mg/L	Semiannually	Semiannually
Carbonate	mg/L	Semiannually	Semiannually
Chloride	mg/L	Semiannually	Semiannually
Magnesium	mg/L	Semiannually	Semiannually
Nitrate as N	mg/L	Semiannually	Semiannually
Potassium	mg/L	Semiannually	Semiannually
Sodium	mg/L	Semiannually	Semiannually
Sulfate	mg/L	Semiannually	Semiannually
Total Dissolved Solids	mg/L	Semiannually	Semiannually
Volatile Organic Compounds (VOCs) ¹	ug/L	Semiannually	Semiannually
<i>Constituents of Concern</i> ¹	---	Every 5 years	Every 5 years

1. See Appendix 1 below.

Lysimeters shall be inspected for the presence of liquid monthly. Lysimeters need only be sampled when liquid is present. If liquid is detected in a previously dry lysimeter, the Discharger shall verbally notify Central Valley Water Board staff within seven days and shall immediately sample and test the liquid for Field and Monitoring Parameters listed in the above table.

- b. Soil Pore Gas Monitoring
 - i. Monitoring Points (See Attachment E: Gas Controls & Monitoring)

The soil pore gas monitoring system for the landfill units shall be as follows:

Table A.2.b.i Soil Pore Gas Monitoring Points				
<u>Unit(s)</u>	<u>Well(s)</u>	<u>Program</u>	<u>Completion</u>	<u>Screen Depths¹</u>
LF-1	SG-2 to SG-7 ²	Detection & Corrective Action	Single Probe	Shallow
	SG-9 to SG-11 ²			Deep
	SG-1 ²			
LF-2	SGs-6, 7 & 10 ³			Shallow
	SG-7 & 9 ³			
Both units	SG-12; SGs-102 to 125 ⁴	Detection	Triple Probe	Shallow, Intermediate, & Deep

1. Screen depths relative to landfill waste column.
2. Corrective action monitoring points for LF-1.
3. Concurrent detection monitoring points for LF-2.
4. Perimeter methane migration monitoring wells.

ii. Monitoring Schedule

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

Table A.2.b.ii Soil Pore Gas Monitoring Schedule			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<i>Field Parameters¹</i>			
Methane	%	Semiannually	Semiannually
Carbon Dioxide	%	Semiannually	Semiannually
Organic Vapors	ppm	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 1% by volume and/or total organic vapors detected above 50 ppbv during monitoring event.
3. VOC analysis shall be conducted using USEPA Method TO-15.

Unsaturated zone samples shall be collected from the monitoring networks listed above and analyzed for the parameters and constituents listed in the monitoring schedules listed above in accordance with the specified methods and frequencies. Samples collected for the 5-year COC analyses specified above

shall be collected and analyzed in accordance with the methods listed in Appendix 1 every five years, beginning again in **2019**.

3. Leachate Monitoring, Seep Monitoring, and Annual LCRS Testing

The Discharger shall operate and maintain leachate collection and removal system (LCRS) sump for each LF-2 landfill module. In addition to monitoring these sumps, the Discharger shall monitor the landfill for leachate seeps, and conduct annual testing of each LCRS in accordance with Title 27 and this monitoring program.

a. Monitoring Points (see Attachment C: Site Map)

i. LCRS Sumps

The leachate monitoring points shall include the LCRS sumps at each existing and future LF-2 landfill modules, as follows:

Table A.3.a LCRS Sump Monitoring Points		
Unit	Module(s)	Monitoring Point
LF-2	1	L-1
	2A ¹	L-2 ¹
	2B, 3 to 10 ²	--- ²

1. Module scheduled for construction in spring, 2015.
 2. Future LF-2 modules (or module phases), and sumps.

The above LCRS sumps shall be inspected monthly for the presence of leachate, and flow shall be recorded in accordance with Table A.3.b below. If leachate is detected in a previously dry sump, the Discharger shall verbally notify Central Valley Water Board staff within **seven days** and shall immediately sample and test the leachate for field and monitoring parameters listed in Table A.3.b. Leachate in the LCRS sump, including any commingled condensate returned to that sump, shall then be sampled for all parameters and constituents in accordance with the frequencies listed in Table A.3.b whenever liquid is present.

All LCRS sump samples shall be analyzed for the 5-year COCs specified in Table III every five years, beginning again in 2019.

ii. Seep Monitoring

The Discharger shall monitor all areas of the landfill (e.g., top deck, side slopes, toe areas, and levee corridor) for leachate seeps, including as part of Facility Monitoring under Section A.6. Any observed leachate seepage from the landfill unit shall be sampled upon detection and analyzed in accordance with Table A.3.b below using the applicable test methods for each constituent listed in Appendix 1 attached to this Order. Reporting for leachate seeps shall be conducted as required in

Section B.3 of this MRP. The quantity of leachate shall be estimated and reported as Leachate Flow Rate (in gallons/day).

iii. Annual LCRS Testing:

All LCRSs shall be tested annually pursuant to Title 27, section 20340(d) to demonstrate proper operation. The results of these tests shall be reported to the Central Valley Water Board in the Annual Monitoring Report and shall include comparisons with earlier tests made under comparable conditions.

b. Monitoring Schedule

Leachate samples shall be collected from the above monitoring network and analyzed in accordance with the following schedule using the applicable test methods for each constituent listed in Appendix 1 attached to this Order.

Table A.3.b Leachate Monitoring Schedule			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<i>Field Parameters</i>			
Total Flow	gallons	Monthly	Semiannually
Flow Rate	gallons/day	Monthly	Semiannually
Electrical Conductivity	umhos/cm	Quarterly	Semiannually
pH	pH units	Quarterly	Semiannually
<i>Monitoring Parameters</i>			
Bicarbonate Alkalinity	mg/L	Semiannually	Semiannually
Calcium	mg/L	Semiannually	Semiannually
Carbonate	mg/L	Semiannually	Semiannually
Chloride	mg/L	Semiannually	Semiannually
Magnesium	mg/L	Semiannually	Semiannually
Nitrate as N	mg/L	Semiannually	Semiannually
Potassium	mg/L	Semiannually	Semiannually
Sulfate	mg/L	Semiannually	Semiannually
TDS	mg/L	Semiannually	Semiannually
VOCs	ug/L	Semiannually	Semiannually
Dissolved Inorganics	ug/L	Annually	Annually
<i>Constituents of Concern¹</i>		Every 5 years	Every 5 years

1. See Appendix 1 below.

4. Surface Water Monitoring

The Discharger shall install and operate a surface water detection monitoring

system to detect a release from the landfill; any resulting impacts to surface or storm water if such a release occurs; and to monitor the effectiveness of the landfill's erosion controls. Surface water monitoring is specifically required where runoff from waste management unit flows, or could flow, to waters of the United States. The monitoring system shall comply with the applicable provisions of Title 27, sections 20415 and 20420.

As described in WDR Finding 37, landfill runoff generally flows to onsite sedimentation basins where it either percolates into the ground or, during peak flows, spills toward a large stock pond in the southeast corner of the site. The stock pond is fed by, and discharges into, a stream flowing along the eastern perimeter of the site. Surface water monitoring is conducted in this stream.

a. Monitoring Points (see Attachment D: Drainage Controls & Monitoring)

Surface/storm water monitoring shall be conducted at upstream and downstream locations along the eastern side of the site and at the three sedimentation basins, as follows:

Table A.4.a Surface Water Monitoring Points		
<u>Monitoring Point</u>	<u>Program</u>	<u>Location</u>
SW-1	Background	Onsite stream upstream of stock pond
SW-2	Detection	Stock Pond
SW-3	Storm Water	Sedimentation Basin 1
SW-4		Sedimentation Basin 2
SW-5		Sedimentation Basin 3

The above monitoring system meets Title 27 requirements for surface water detection monitoring.

b. Monitoring Schedule

Surface water samples shall be collected from the above monitoring network and analyzed in accordance with the following schedule using the applicable test methods for each constituent listed in Appendix 1 attached to this Order.

Table A.4.b Surface Water Monitoring Schedule			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<i>Field Parameters</i>			
Temperature	°F	Semiannually	Semiannually
Electrical Conductivity	umhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
Turbidity	NTU	Semiannually	Semiannually
<i>Monitoring Parameters</i>			
Bicarbonate Alkalinity	mg/L	Semiannually	Semiannually
Calcium	mg/L	Semiannually	Semiannually
Carbonate	mg/L	Semiannually	Semiannually
Chloride	mg/L	Semiannually	Semiannually
Magnesium	mg/L	Semiannually	Semiannually
Nitrate as N	mg/L	Semiannually	Semiannually
Potassium	mg/L	Semiannually	Semiannually
Sulfate	mg/L	Semiannually	Semiannually
TDS	mg/L	Semiannually	Semiannually
VOCs	ug/L	Annually	Annually
Dissolved Inorganics	ug/L	Annually	Annually
<i>Constituents of Concern</i> ^{1,2}		Every 5 years	Every 5 years

1. See Appendix 1 below.

2. 5-year COC sampling may be limited to stock pond monitoring (SW-3).

Storm water monitoring shall also be conducted in accordance with the most recently adopted version of the NPDES General Industrial Storm Water Permit required under Standard Facility Specification E.15, SPRR for landfills that have a surface water discharge (a new version of this permit becomes effective on 1 July 2015). See also WDR Finding 37.

5. Solid Waste Monitoring

The Discharger shall monitor all wastes discharged to the landfill on a quarterly basis and report to the Board as follows:

Table A.5 Solid Waste Monitoring Schedule			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
Quantity of waste discharged	cu yds & tons ^{1,2}	Semiannually	Semiannually
Type(s) of waste discharged	---	Semiannually	Semiannually
Quantity of cover discharged	cu yds & tons ^{1,2}	Semiannually	Semiannually
Type(s) of cover discharged	---	Semiannually	Semiannually
Elevation range of discharges	MSL	Annually	Annually
Remaining landfill capacity	%	Annually	Annually

1. Tonnage shall be estimated based on volume conversion.
2. Volume conversion factor used for estimating landfill tonnage shall also be reported.

6. 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, 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 problems areas before and after repairs. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. Annual facility inspection reporting shall be submitted as required in Section B.4 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 problems areas before and after repairs. Necessary repairs shall be completed **within 30 days** of the inspection. Notification and reporting requirements for major storm events shall be conducted as required in Section B.5 of this MRP.

c. Five-Year Topographic Surveys

i. Closed Units

For closed landfill units or portions thereof (e.g., LF-1), the Discharger shall conduct a five-year iso-settlement survey and 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 (or ET cover, as applicable). The next iso-settlement survey shall be conducted by **15 November 2017**. See Standard Closure and Postclosure Specification G.22, SPRR; Title 27, section 21090(e)(1 & 2).

ii. Active Units

For active units, or portions thereof, the Discharger shall provide copies of topographic maps obtained from 5-year aerial topographic surveys conducted under Title 27, section 21570(f) (10) for active landfill units/modules (i.e., LF-2).

Reporting of the above shall be in accordance with Section B.6 of this MRP.

d. Standard Observations

The Discharger shall conduct Standard Observations at the landfill in accordance with this section of the MRP. Standard observations shall be conducted monthly during the wet season (1 October to 30 April) and quarterly during the dry season (1 May to 30 September). The Standard Observations shall include:

i. For the landfill units:

- (1) 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
- (2) Evidence of erosion and/or of day-lighted refuse.

ii. Along the perimeter of the landfill units:

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

iii. For receiving waters:

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

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

Facility Monitoring shall also include continuous leachate seep monitoring under Section A.3.a.ii.

7. Additional Corrective Action Monitoring – Landfill Gas

LFG monitoring shall be conducted to assess the nature and source of impacts at the site; to provide an ongoing assessment as to the effectiveness of existing landfill gas controls in mitigating that source; and to evaluate the possible need for additional corrective action measures to protect underlying water bearing media.

a. Monitoring Points

The LFG extraction system for LF-1 shall be monitored at the following monitoring points:

- i. GX-1 through GX-9 (vertical wells) and all future LFG extraction wells installed at LF-1; and
- ii. Sampling port on LF-1 gas header

The LF-1 extraction system monitoring network shall also include all future LFG extraction wells installed at LF-1 (e.g., such as per the revised Engineering Feasibility Study described in WDR Finding 101).

b. Monitoring Schedule

Gas samples shall be collected from the above monitoring network and analyzed in accordance with the following schedule using the applicable test methods.

Table A.7.b LFG Monitoring Schedule			
<u>Parameter</u>	<u>Units</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
<i>Field Parameters¹</i>			
Flow rate ²	cu ft/min	Semiannually	Semiannually
Vacuum	psi	Semiannually	Semiannually
Temperature	oF	Semiannually	Semiannually
Methane	%	Semiannually	Semiannually
Carbon dioxide	%	Semiannually	Semiannually
Oxygen	%	Semiannually	Semiannually

Table A.7.b LFG Monitoring Schedule (continued)			
<u>Parameter</u>	<u>Units</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Organic Vapors	ppmv	Semiannually	Semiannually
<i>Monitoring Parameter</i>			
VOCs (USEPA Method TO-15) ³	µg/cm ³	Semiannually	Semiannually
Total VOCs removed per year ³	lbs/yr	Annually	Annually
Cumulative VOCs removed ³	lbs	Annually	Annually

1. Field monitoring shall be conducted using appropriate measuring device for each parameter,
2. LFG rom LF-1 shall be metered and sampled at an appropriate location along the LFG header pipe.
3. VOC monitoring may be limited to gas samples collected from LF-1 gas header.

B. REPORTING

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

Reporting Schedule			
<u>Section</u>	<u>Report</u>	<u>End of Reporting Period</u>	<u>Due Date</u>
B.1	Semiannual Monitoring Report	30 June & 31 December	1 August, 1 February
B.2	Annual Monitoring Report	31 December	1 February
B.3	Seep Reporting	Continuous	Immediately & Within 7 Days
B.4	Annual Facility Inspection Report	31 October	15 November
B.5	Major Storm Event Reporting	Continuous	Immediately & 14 days from damage repair
B.6	Topographic Survey & Iso-Settlement Maps	Every 5 Years	15 December 2017 & every 5 years thereafter

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. R5-2015-0058 and the SPRR, particularly the monitoring and response to release provisions (i.e., WDR Section G and SPRR Sections I and J). 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 under this Order 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.

Required Reports

1. Semiannual Monitoring Report

Monitoring reports shall be submitted semiannually and are due on **1 August** and **1 February**. Each semiannual monitoring report shall contain at least the following:

- a. For each groundwater monitoring point addressed by the report, a description of:
 - i. The time of water level measurement;
 - ii. 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;
 - iii. 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;
 - iv. The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and
 - v. A statement that the sampling procedure was conducted in accordance with the approved Sample Collection and Analysis Plan.
- b. A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.
- c. The estimated quarterly groundwater flow rate and direction in the uppermost aquifer, in any zones of perched water, and in any additional zone of saturation monitored based upon water level elevations taken prior to the collection of the water quality data submitted in the report [Title 27, section 20415(e)(15)].
- d. Cumulative tabulated monitoring data for all monitoring points and constituents for groundwater, 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 IV 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 for wells/constituents not already in corrective action monitoring.

- g. An evaluation of the effectiveness of run-off/run-on control facilities.
- h. The results of Facility Monitoring, including, but not limited to, a summary of all Standard Observations for the reporting period required in Section A.6.d of this MRP.
- i. A discussion as to the effectiveness of corrective action per Title 27, section 20430(h).

2. **Annual Monitoring Report**

The Discharger shall submit an Annual Monitoring Report to the Central Valley Water Board by **1 February** covering the reporting period of the previous monitoring year. If desired, the Annual Monitoring Report may be combined with the second semiannual report, but if so, shall clearly state that it is both a semi-annual and annual monitoring report in its title. Each Annual Monitoring Report shall contain the following 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, than 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 quarterly 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 Corrective Action Program.

3. **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 A.3.b 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.

4. **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.6.a of this MRP, above.

5. **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.6.b of this MRP, above.

6. **5-Year Topographic Survey(s)**

By **15 November 2017** and no less frequent than **every five years** thereafter, the Discharger shall submit the results of the topographic survey(s) completed under MRP Section A.6.c, including topographic survey and iso-settlement maps for LF-1 per Title 27, section 21090(e) and Standard Closure and Postclosure

Specification G.22, SPRR for closed units (LF-1); and a topographic map showing the development contours of LF-2 per Title 27, section 21570(f) (10).

C. WATER QUALITY PROTECTION STANDARD

The Water Quality Protection Standard for the landfill unit shall consist of all Constituents of Concern (COCs), Concentration Limits, the Point of Compliance, and all Monitoring Points consistent with this Order and Title 27, Section 20390.

1. Water Quality Protection Standard Report

By **31 January 2016**, the Discharger shall submit a Water Quality Protection Standard Report proposing a Water Quality Protection Standard for each landfill unit (i.e., LF-1 and LF-2) consistent with the Findings and Requirements of this Order. See WDR Provision H.7. At a minimum, the report shall include the following information:

- a. Identify **all distinct bodies of surface and ground water** that could be affected in the event of a release from a waste management unit or portion of a unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.
- b. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).
- c. A map showing the monitoring points and background monitoring points for groundwater, the unsaturated zone, and surface water for each unit. The map shall show the point of compliance for each unit in accordance with Title 27, section 20405.
- d. Listings/tables showing all elements of the Water Quality Protection Standard for each unit and water bearing media, including, but not limited to, concentration limits for all monitoring parameters and 5-year COCs. See Standard Monitoring Specification I.25, SPRR.
- e. Proposed data analysis methods for calculating concentration limits for monitoring parameters and constituents of concern detected in 10% or greater of the background data (naturally-occurring constituents) per Title 27, section 20415(e)(8)(A-D)] or section 20415(e)(8)(E).
- f. 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).

Once approved, the concentration limits of the Water Quality Protection Standard shall be annually updated to reflect current background monitoring data using the approved data analysis methods. Any subsequent proposed changes to the Water Quality Protection Standard, other than annual update of

the concentration limits shall be submitted in a report for review and approval. The Water Quality Protection Standard shall be certified by a California-registered civil engineer or geologist as meeting the requirements of Title 27.

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 (groundwater), A.2.a.ii (soil pore water), A.2.b.ii (soil pore gas), A.3 (leachate), A.4.b (surface/storm water), and A.7.b (landfill gas).

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 at least every five years [Title 27, sections 20395 and 20420(g)]. The COCs for all waste management units at the facility are those referenced in Tables A.1.b (groundwater), A.2.a.ii (soil pore water), A.4.b (surface/storm water), and Appendix 1 (attached). The Discharger shall monitor all COCs every 5 years (or more frequently if required in a Corrective Action Program). The first 5-year COC monitoring event under this Order shall be conducted by **15 September 2019** and the results reported in the Second Half and Annual 2015 monitoring report due by **31 January 2020**.

4. Concentration Limits

As noted in WDR Finding 53, the Discharger does not yet have a complete list of approved concentration limits for naturally occurring constituents and no Water Quality Protection Standard Report has ever been submitted for this site. Proposed concentration limits for all water bearing media (e.g., surface water and groundwater) shall therefore be included in the Water Quality Protection Standard Report required under WDR Provision H.7.

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

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

Detection Monitoring - The concentration limits for non-naturally-occurring constituents of concern (e.g., VOCs) shall be non-detect. The concentration limits for naturally-occurring COCs (e.g., inorganics) shall be determined based

on an interwell monitoring procedure using upgradient monitoring data, unless the Discharger is able to demonstrate to the satisfaction of the Executive Officer that an intrawell approach is more representative of background conditions at the site due to the presence of significant spatial variability in the groundwater geochemistry not attributable to a release from the unit. 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 under the Water Quality Protection Standard Report required under WDR Provision H.7 and approved by Board staff.

Corrective Action Monitoring -- The concentration limits for corrective action monitoring shall 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. An intrawell statistical procedure (e.g., the Sens Slope Method) shall be used for trend analysis to monitor corrective action progress.

Concentration limits for naturally occurring COCs shall be updated annually and included in the Annual Report submitted under this MRP. See Section B.2.g.

5. 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. As described in WDR Finding 49, the existing Point of Compliance wells for LF-1 are limited to side gradient wells because it is not feasible to monitor groundwater immediately down gradient of LF-1 (i.e., LF-1 and LF-2 are contiguous units). Groundwater directly downgradient of LF-1 is therefore contiguously monitored along LF-2's Point of Compliance (e.g., at MW-6). See Table A.1.a.

6. 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].


7. Monitoring Points

A monitoring point is a well, device, or location specified in the waste discharge requirements at 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 Order.

Ordered by: 
PAMELA C. CREEDON, Executive Officer

17 April 2015

JDM/WMH

Appendix 1

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

General Minerals

	USEPA Method
Bicarbonate	2320B
Calcium	200.7/600
Carbonate	2320B
Chloride	300
Magnesium	200.7/600
Nitrate – Nitrogen	300
Potassium	200.7/600
Sodium	200.7/600
Sulfate	300
Total Dissolved Solids	2540C

Volatile Organic Compounds:

USEPA Method 8260B

Acetone
Acetonitrile (Methyl cyanide)
Acrolein
Acrylonitrile
Allyl chloride (3-Chloropropene)
Benzene
Bromochloromethane (Chlorobromomethane)
Bromodichloromethane (Dibromochloromethane)
Bromoform (Tribromomethane)
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Chloroprene
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans- 1,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC 12)

1,1 -Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1 -Dichloroethylene (1, 1-Dichloroethene; Vinylidene chloride)
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans- 1,2-Dichloroethylene (trans- 1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
1,3-Dichloropropane (Trimethylene dichloride)
2,2-Dichloropropane (Isopropylidene chloride)
1,1 -Dichloropropene
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Di-isopropylether (DIPE)
Ethanol
Ethyltertiary butyl ether
Ethylbenzene
Ethyl methacrylate
Hexachlorobutadiene
2-Hexanone (Methyl butyl ketone)
Isobutyl alcohol
Methacrylonitrile
Methyl bromide (Bromomethane)
Methyl chloride (Chloromethane)
Methyl ethyl ketone (MEK; 2-Butanone)
Methyl iodide (Iodomethane)
Methyl t-butyl ether
Methyl methacrylate
4-Methyl-2-pentanone (Methyl isobutyl ketone)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Naphthalene
Propionitrile (Ethyl cyanide)
Styrene
Tertiary amyl methyl ether
Tertiary butyl alcohol
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene; PCE)
Toluene
1,2,4-Trichlorobenzene
1,1,1 -Trichloroethane (Methylchloroform)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene; TCE)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
Vinyl acetate
Vinyl chloride (Chloroethene)
Xylene (total)

Inorganics (dissolved):

USEPA Method

Aluminum	6010
Antimony	7041
Barium	6010
Beryllium	6010
Cadmium	7131A
Chromium	6010
Cobalt	6010
Copper	6010
Silver	6010
Tin	6010
Vanadium	6010
Zinc	6010
Iron	6010
Manganese	6010
Arsenic	7062
Lead	7421
Mercury	7470A
Nickel	7521
Selenium	7742
Thallium	7841
Cyanide	9010C
Sulfide	9030B

Semi-Volatile Organic Compounds:

USEPA Method 8270D - base, neutral, & acid extractables

Acenaphthene
Acenaphthylene
Acetophenone
2-Acetylaminofluorene (2-AAF)
Aldrin
4-Aminobiphenyl
Anthracene
Benzo[a]anthracene (Benanthracene)
Benzo[b]fluoranthene
Benzo[k]fluoranthene
Benzo[g,h,i]perylene
Benzo[a]pyrene
Benzyl alcohol
Bis(2-ethylhexyl) phthalate
alpha-BHC
beta-BHC
delta-BHC
gamma-BHC (Lindane)
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl) ether (Dichloroethyl ether)
Bis(2-chloro-1-methylethyl) ether (Bis(2-chloroisopropyl) ether; DCIP)
4-Bromophenyl phenyl ether
Butyl benzyl phthalate (Benzyl butyl phthalate)

Chlordane
p-Chloroaniline
Chlorobenzilate
p-Chloro-m-cresol (4-Chloro-3-methylphenol)
2-Chloronaphthalene
2-Chlorophenol
4-Chlorophenyl phenyl ether
Chrysene
o-Cresol (2-methylphenol)
m-Cresol (3-methylphenol)
p-Cresol (4-methylphenol)
4,4'-DDD
4,4'-DDE
4,4'-DDT
Diallate
Dibenz[a,h]anthracene
Dibenzofuran
Di-n-butyl phthalate
3,3'-Dichlorobenzidine
2,4-Dichlorophenol
2,6-Dichlorophenol
Dieldrin
Diethyl phthalate
p-(Dimethylamino)azobenzene
7,12-Dimethylbenz[a]anthracene
3,3'-Dimethylbenzidine
2,4-Dimethylphenol (m-Xylenol)
Dimethyl phthalate
m-Dinitrobenzene
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Di-n-octyl phthalate
Diphenylamine
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Ethyl methanesulfonate
Famphur
Fluoranthene
Fluorene
Heptachlor
Heptachlor epoxide
Hexachlorobenzene
Hexachlorocyclopentadiene
Hexachloroethane
Hexachloropropene
Indeno(1,2,3-c,d)pyrene

Isodrin
Isophorone
Isosafrole
Kepone
Methapyrilene
Methoxychlor
3-Methylcholanthrene
Methyl methanesulfonate
2-Methylnaphthalene
1,4-Naphthoquinone
1-Naphthylamine
2-Naphthylamine
o-Nitroaniline (2-Nitroaniline)
m-Nitroaniline (3-Nitroaniline)
p-Nitroaniline (4-Nitroaniline)
Nitrobenzene
o-Nitrophenol (2-Nitrophenol)
p-Nitrophenol (4-Nitrophenol)
N-Nitrosodi-n-butylamine (Di-n-butylnitrosamine)
N-Nitrosodiethylamine (Diethylnitrosamine)
N-Nitrosodimethylamine (Dimethylnitrosamine)
N-Nitrosodiphenylamine (Diphenylnitrosamine)
N-Nitrosodipropylamine (N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine)
N-Nitrosomethylethylamine (Methylethylnitrosamine)
N-Nitrosopiperidine
N-Nitrosopyrrolidine
5-Nitro-o-toluidine
Pentachlorobenzene
Pentachloronitrobenzene (PCNB)
Pentachlorophenol
Phenacetin
Phenanthrene
Phenol
p-Phenylenediamine
Polychlorinated biphenyls (PCBs; Aroclors)
Pronamide
Pyrene
Safrole
1,2,4,5-Tetrachlorobenzene
2,3,4,6-Tetrachlorophenol
o-Toluidine
Toxaphene
2,4,5-Trichlorophenol
0,0,0-Triethyl phosphorothioate
sym-Trinitrobenzene

Chlorophenoxy Herbicides:

USEPA Method 8151A

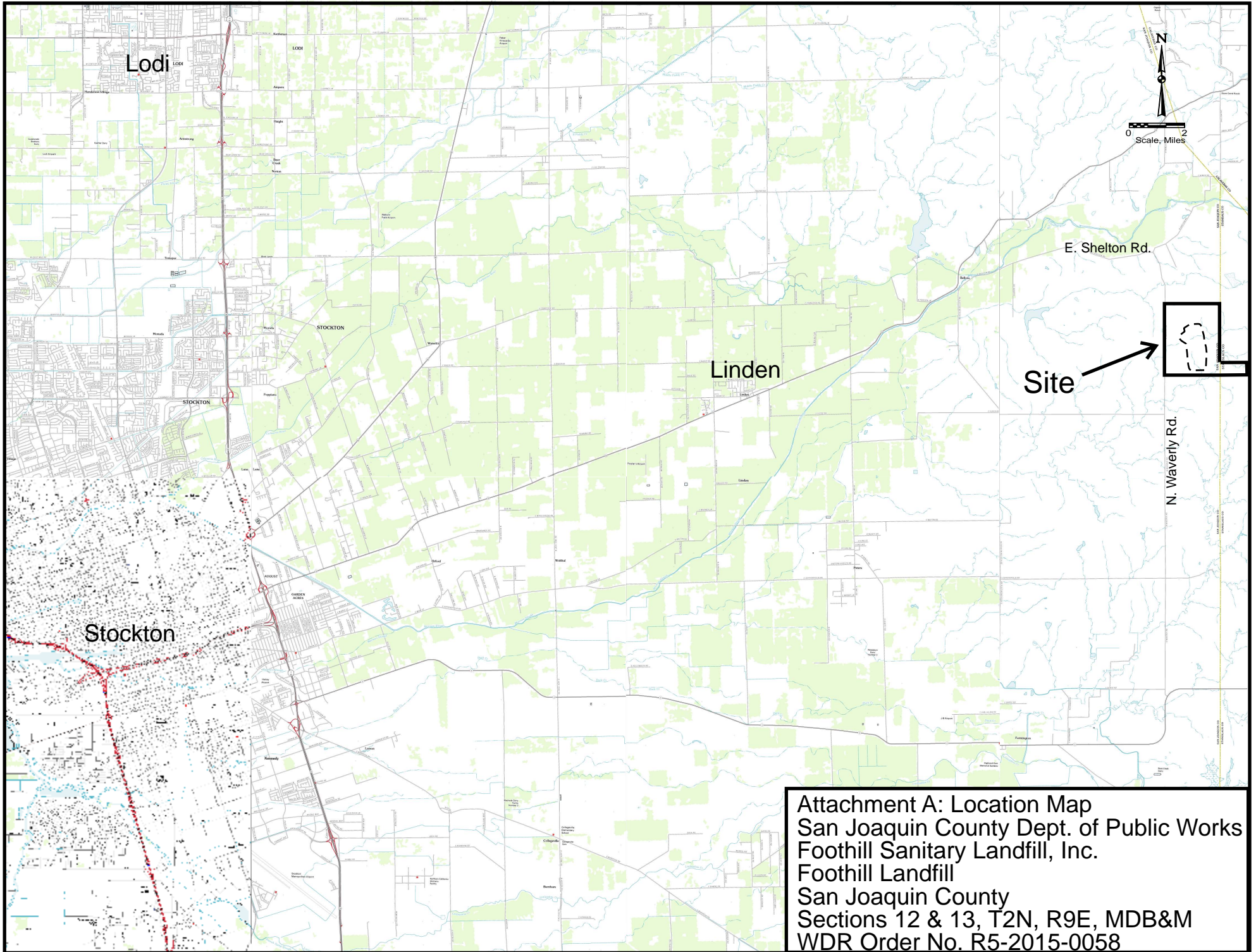
2,4-D (2,4-Dichlorophenoxyacetic acid)
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)

Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)

Organophosphorus Compounds:

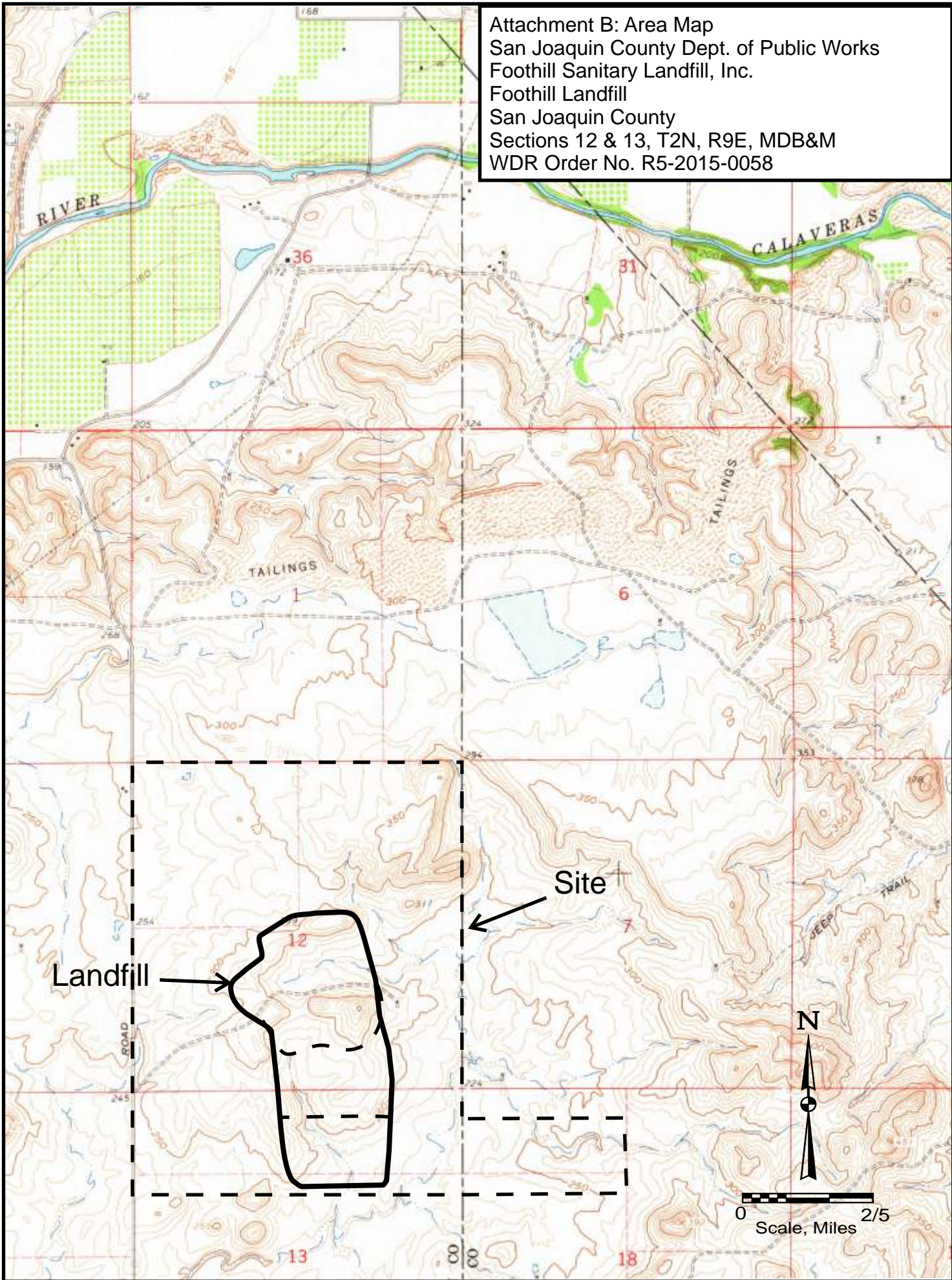
USEPA Method 8141B

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








Attachment A: Location Map
San Joaquin County Dept. of Public Works
Foothill Sanitary Landfill, Inc.
Foothill Landfill
San Joaquin County
Sections 12 & 13, T2N, R9E, MDB&M
WDR Order No. R5-2015-0058

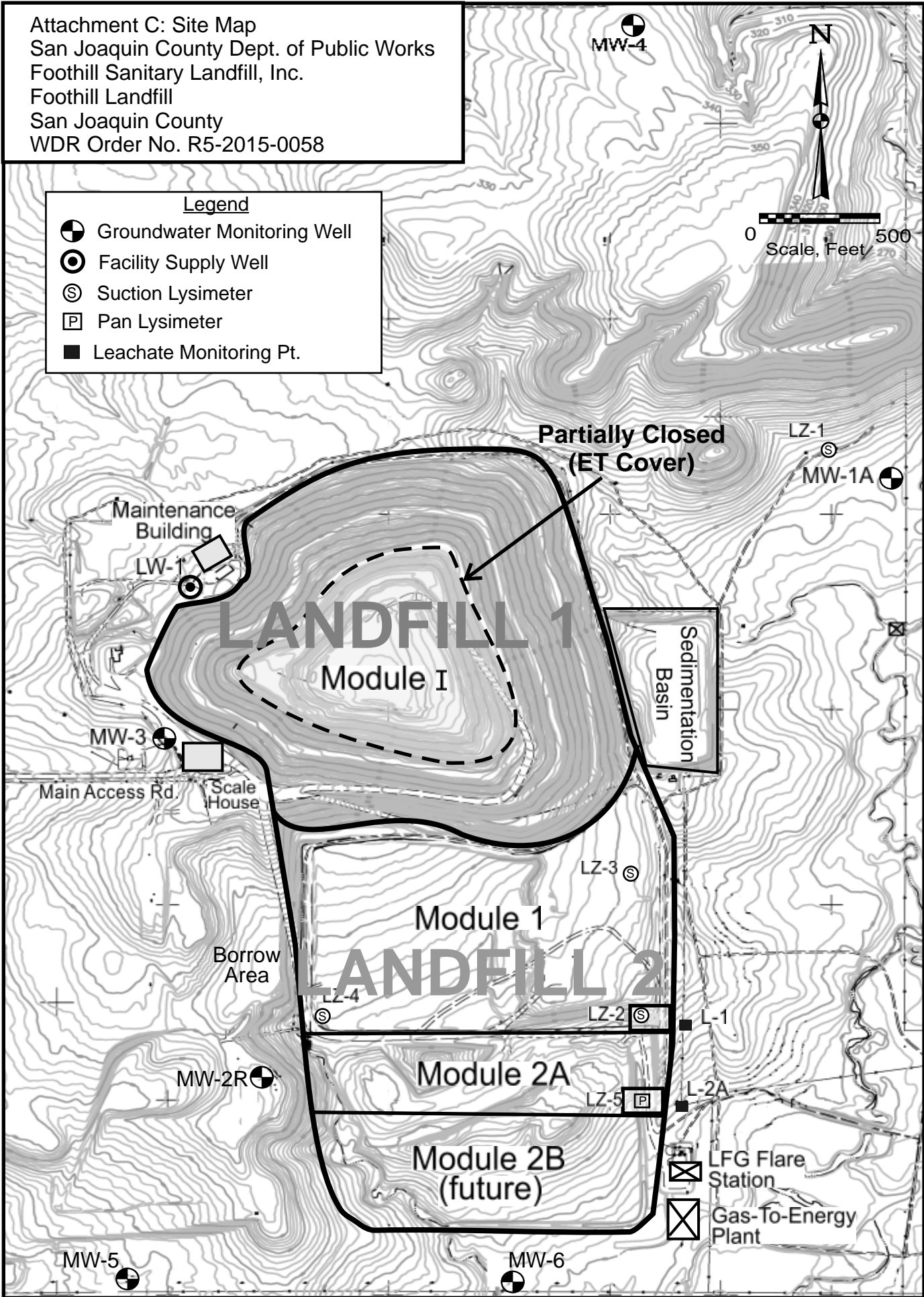
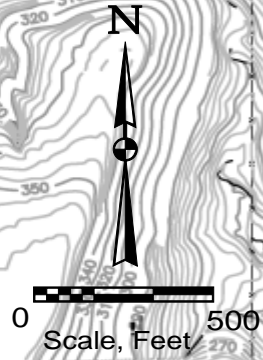
Attachment B: Area Map
San Joaquin County Dept. of Public Works
Foothill Sanitary Landfill, Inc.
Foothill Landfill
San Joaquin County
Sections 12 & 13, T2N, R9E, MDB&M
WDR Order No. R5-2015-0058



Attachment C: Site Map
 San Joaquin County Dept. of Public Works
 Foothill Sanitary Landfill, Inc.
 Foothill Landfill
 San Joaquin County
 WDR Order No. R5-2015-0058

Legend

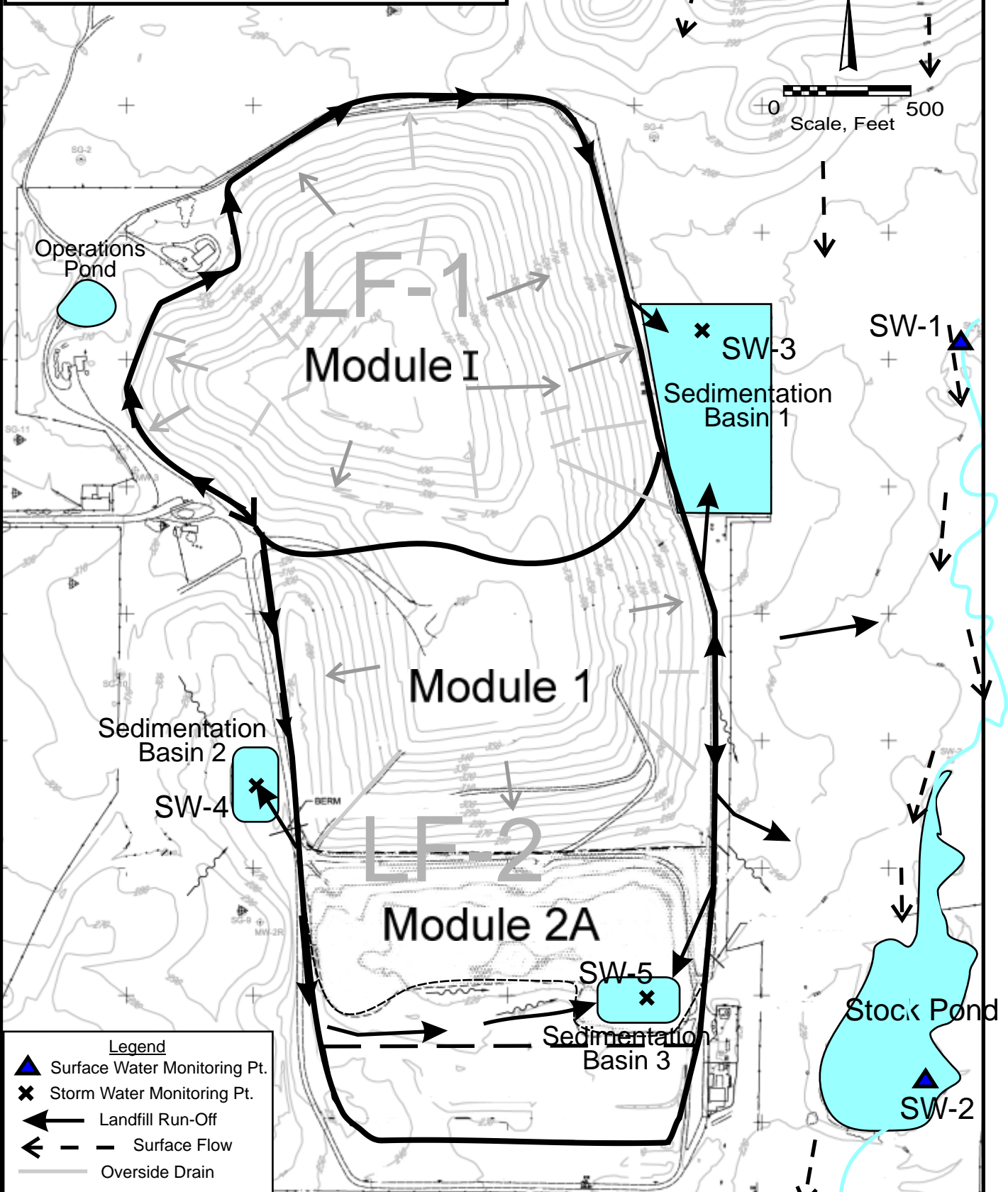
-  Groundwater Monitoring Well
-  Facility Supply Well
-  Suction Lysimeter
-  Pan Lysimeter
-  Leachate Monitoring Pt.








Attachment D: Drainage Controls & Monitoring
 San Joaquin County Dept. of Public Works
 Foothill Sanitary Landfill, Inc.
 Foothill Landfill
 San Joaquin County
 WDR Order No. R5-2015-0058

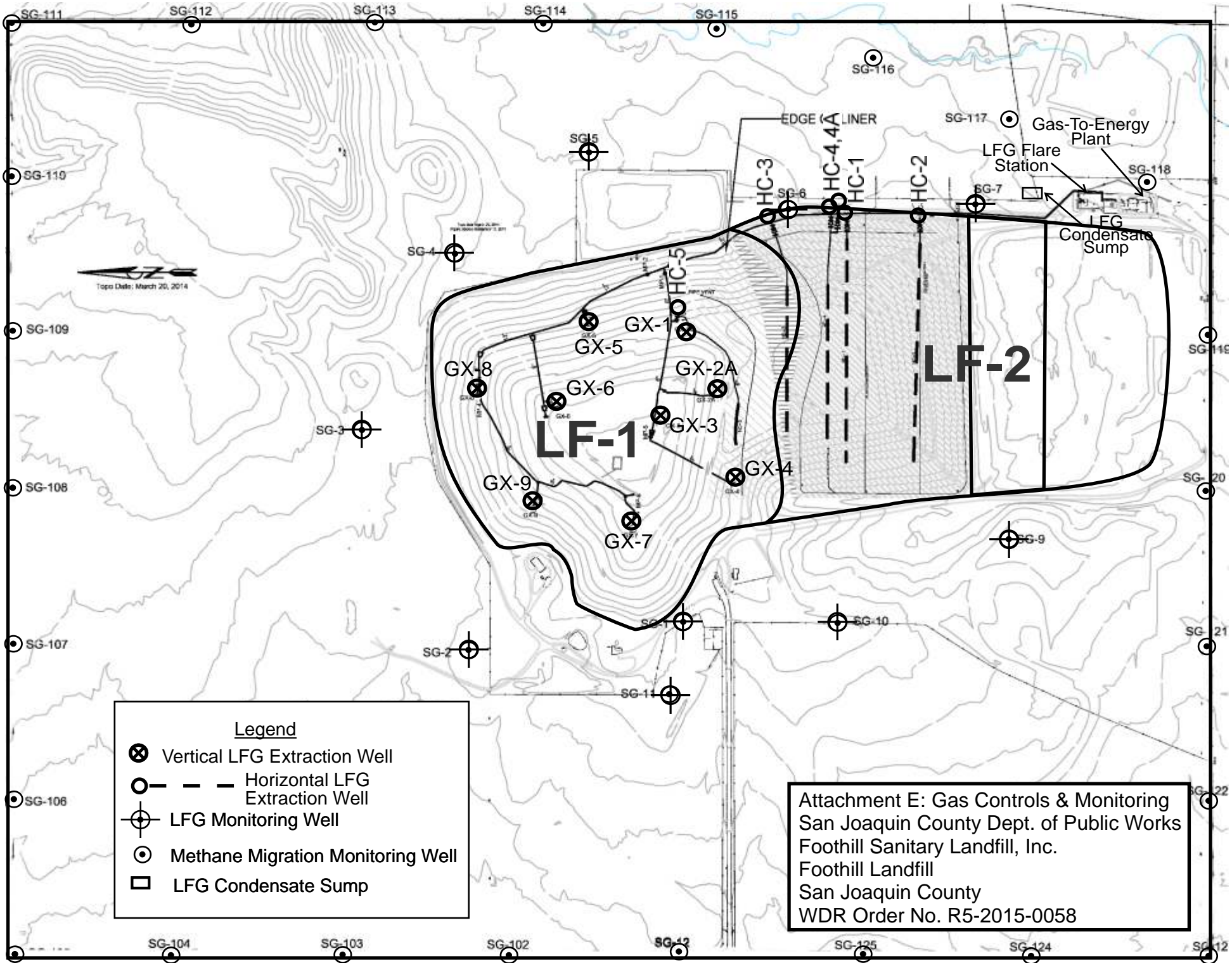


Scale, Feet 500



Legend

-  Surface Water Monitoring Pt.
-  Storm Water Monitoring Pt.
-  Landfill Run-Off
-  Surface Flow
-  Overside Drain



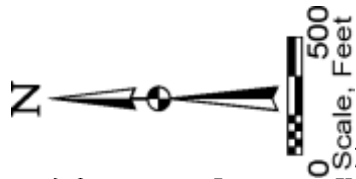
Legend

- ⊗ Vertical LFG Extraction Well
- - - - Horizontal LFG Extraction Well
- ⊕ LFG Monitoring Well
- ⊙ Methane Migration Monitoring Well
- LFG Condensate Sump

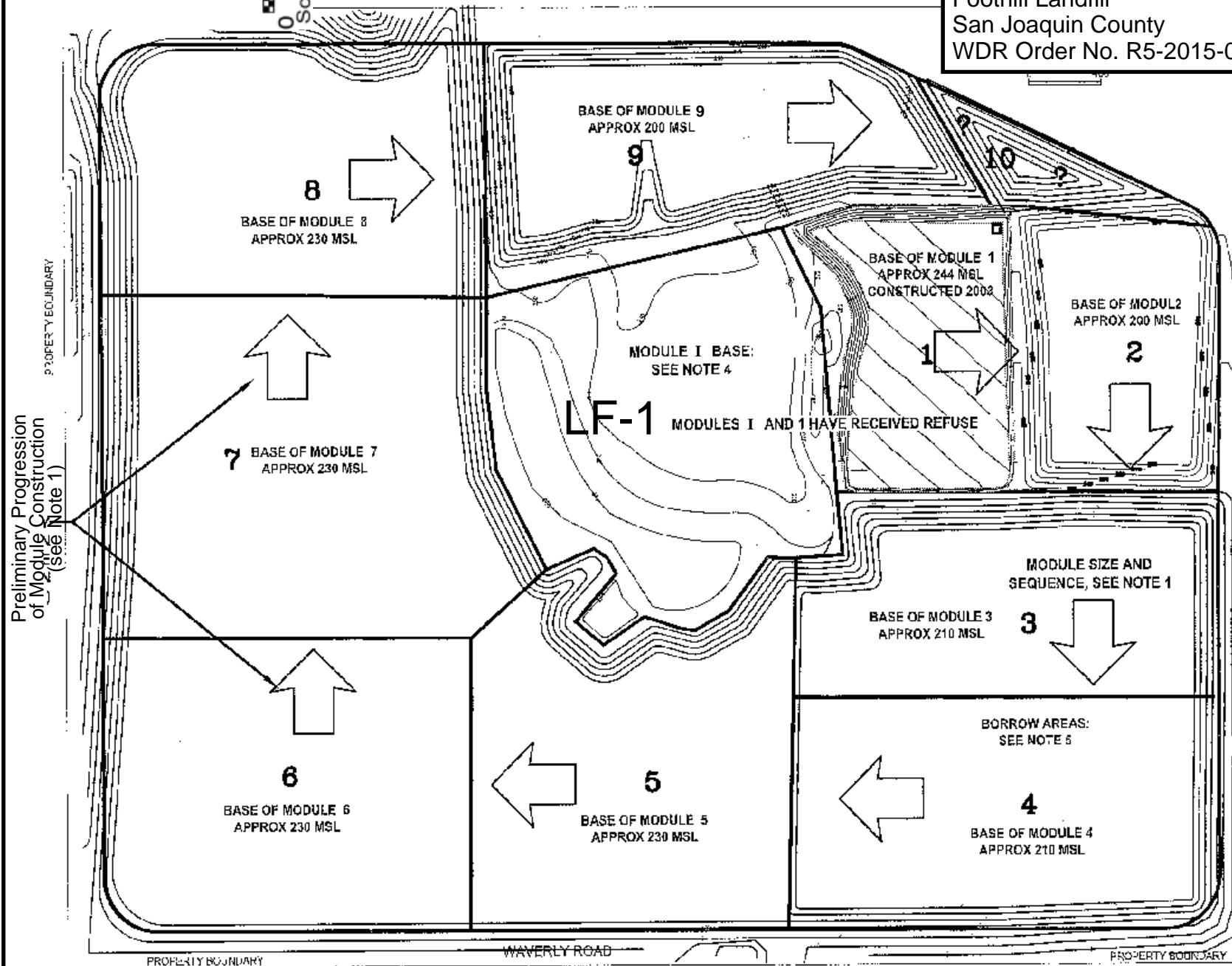
Attachment E: Gas Controls & Monitoring
 San Joaquin County Dept. of Public Works
 Foothill Sanitary Landfill, Inc.
 Foothill Landfill
 San Joaquin County
 WDR Order No. R5-2015-0058

Topo Date: March 20, 2014

Attachment F: Conceptual Development Plan
 San Joaquin County Dept. of Public Works
 Foothill Sanitary Landfill, Inc.
 Foothill Landfill
 San Joaquin County
 WDR Order No. R5-2015-0058



PROPERTY BOUNDARY



Preliminary Progression
of Module Construction
(See Note 1)

NOTES:

- 1) MODULE LOCATION, AREAS, AND SEQUENCE ARE CONCEPTUAL, AND MAY BE REVISED ACCORDING TO REFUSE INFLOW, REGULATORY REQUIREMENTS, AND OTHER SITE NEEDS.
- 2) LIMITS OF EXCAVATION SHOWN, REFUSE WILL BE APPROXIMATELY THREE FEET ABOVE THIS ELEVATION
- 3) BASE DESIGN FOR MODULES 2 THROUGH 10 ARE CONCEPTUAL. SUMPS AND SLOPE OF MODULE FLOOR NOT SHOWN.
- 4) BASE OF MODULE "I" EXCAVATED PRIOR TO COUNTY OWNERSHIP. ENGINEERING DESIGN OF EXCAVATION NOT AVAILABLE. BASE SHOWN IS ESTIMATED FROM RECOUNT BY SITE STAFF.
- 5) FUTURE MODULE BECOMES BORROW AREA FOR ACTIVE MODULE (TYP)

INFORMATION SHEET

ORDER NO. R5-2015-0058
SAN JOAQUIN COUNTY DEPARTMENT OF PUBLIC WORKS
FOOTHILL SANITARY LANDFILL, INC.
FOOTHILL LANDFILL
SAN JOAQUIN COUNTY

Background

The Foothill Landfill is an active, Class III, municipal solid waste (MSW) landfill on North Waverly Road approximately 1.7 miles south of North Shelton Road in San Joaquin County. The landfill has been in operation since 1965, accepting household, commercial, industrial, and agricultural wastes from the City of Stockton and surrounding areas. Approximately 600 tons per day (210,000 tons per year) of wastes were discharged to the landfill in 2014.

The landfill consists of two classified MSW landfill units under Title 27 regulations, including Landfill 1 (LF-1) and Landfill 2 (LF-2). LF-1 consists of a single, 80-acre, unlined module referred to as "Module 1" that no longer accepts wastes. LF-1 was partially closed in 2006 with an ET cover on its top deck. LF-2 is a Subtitle D compositely-lined, expansion landfill being constructed in phases around LF-1. At projected landfill closure in the year 2082, LF-2 will consist of 10 Subtitle D compositely-lined waste disposal modules encircling and partially overlapping LF-1. See WDR Attachment F: Conceptual Landfill Development Plan. The first LF-2 module, Module 1 (M-1), was constructed immediately south of LF-1. The first phase of the next LF-2 module, M-2, will be constructed in 2015.

Other onsite facilities include landfill-associated controls and monitoring systems (e.g., leachate, landfill gas, surface water, groundwater); an onsite borrow area; storm water retention basins/ponds; landfill access roads, maintenance buildings, a scale house; a landfill gas-to-energy plant; and various other landfill-related facilities.

Geology

The site is underlain by Laguna alluvial deposits and cemented to partially-cemented Mehrten deposits. Laguna soils generally consist of silty sand, clayey silt, and silty clay to approximately 10 feet bgs. Underlying Mehrten deposits generally include clay/claystone, silt/siltstone, sand/sandstone, and conglomerates. In-place hydraulic conductivities generally range from 1×10^{-3} cm/sec (sand/sandstone) to 1×10^{-7} cm/sec (clay/claystone).

Groundwater

First encountered groundwater at the site occurs at about 200 to 300 feet below ground surface (bgs) in Mehrten sands. The average groundwater elevation at the site is about 45 feet MSL. The uppermost aquifer occurs in Mehrten alluvium (e.g., sandy gravel) with an overall permeability of about 9×10^{-3} cm/sec. The groundwater gradient is typically about 0.0025 ft/ft toward the southeast. There are currently six groundwater monitoring wells at the site, including one background well (MW-4), two side gradient wells (MW-1A, and MW-3), and three down gradient wells (MW-2R, MW-5, and MW-6). MW-2R and MW-3 are Point of Compliance wells for LF-2 (Module 1) and LF-1, respectively, while MW-5 (installed in 2010) and MW-6 (installed in 2015) contiguously monitor both landfill units along the southern site

boundary. Each contiguous monitoring well (i.e., MW-5, MW-6) is a corrective action monitoring well for LF-1 and a detection monitoring well for LF-2.

Low to trace concentrations of volatile organic compounds (VOCs), primarily of Trichloroethene (TCE) and 1,1-Dichloroethene (DCE), have been intermittently detected in monitoring well MW-3 adjacent to unlined LF-1 since 1995, indicating a historical release from LF-1. TCE, for example, has been historically detected in MW-3 up to 4.0 µg/L (January 1999) and was recently detected in MW-3 at 4.0 µg/L (January 2014). No VOCs have been confirmed in any of the other groundwater monitoring wells at the site. No significant exceedances of inorganic parameters have been historically confirmed at the site.

Landfill Design and Construction

Landfill 1

Previous WDRs classified unlined unit LF-1 as a Class III landfill unit based on a finding that the natural geologic materials underlying the unit were sufficiently protective of underlying groundwater beneficial uses to meet Class III unit containment standards. See Title 27, sections 20240 and 20260. Monitoring data has since indicated that waste constituents from LF-1 have migrated into the unsaturated zone and groundwater indicating that the natural geologic materials underlying the site do not meet Class III containment standards. Instead of declassifying or reclassifying LF-1, these WDRs require that LF-1 be completely closed.

Landfill 2

Previous WDRs Order R5-2003-0020 approved an engineered alternative design (EAD) to the Title 27/Subtitle D prescriptive liner design for an MSW landfill proposed by the Discharger for the containment systems of LF-2, Module 1 and future expansion modules at the site. LF-2, Module 1 was constructed consistent with this approved EAD and CAO R5-2004-0706, which required installation of an HDPE barrier layer between overlapping portions of Module 1 and Module I as a corrective action measure (i.e., to prevent landfill gas migration into Module I from Module 1). Module 2, Phase A (to be constructed immediately south of Module 1) and future modules/phases will also be constructed in accordance with the approved EAD. See WDR Finding 74.

In 2006, the Discharger implemented various corrective action measures (e.g., partial landfill closure, landfill gas extraction) to address the VOC release under Cleanup and Abatement Order (CAO) R5-2004-0706 issued by the Executive Officer (see WDR Finding 95).

ET Cover Demonstration Project

The 2006 Site Improvement Program (see WDR Finding 96) included partial closure of Module I with an evapotranspirative (ET) final cover on its top deck as an EAD to Title 27 prescriptive closure requirements. The ET cover demonstration project included a 2,500 square foot test pad equipped with soil moisture monitoring equipment (e.g., time domain reflectometers coupled with heat dissipation units) placed at specified depths (i.e., 1, 2 and 3 feet below surface) within the 4.5-foot thick ET cover soil; an underlying percolation layer and a geomembrane to allow for recovery and measurement of percolation/seepage through the ET cover; plumbing for recovery and measurement of surface runoff; and a small weather

station equipped with telemetry for wireless transmission of monitoring data. Test pad monitoring results for a required 5-year demonstration period indicated that the test pad area was allowing significantly less seepage than that indicated by design modelling results. In an 11 July 2014 letter, Water Board acknowledged that the landfill had been partially closed as required under CAO R5-2004-0706.

Landfill Gas Controls

The landfill gas (LFG) extraction system installed as part of the 2006 Site Improvement Project included the installation of 9 vertical extraction wells (GX-1 through GX-9) at LF-1; 5 horizontal extraction wells (HC-1 through HC-5) at LF-2, Module 1; and associated LFG collection and treatment facilities (i.e., lateral and header piping, condensate facilities, 2 blower motors, and a flare station). A gas-to-energy plant was subsequently installed in 2010 to generate electricity from the extracted landfill gas. In 2014, in response to a Water Board staff request, the Discharger submitted an amended Engineering Feasibility Study (EFS) proposing the installation of additional LFG controls and monitoring wells at the landfill as part of the corrective action program to address VOC impacts to groundwater at the site. The amended EFS has not yet been approved by Water Board staff. See WDR Finding 101.

Revised WDRs

These revised WDRs classify the unlined landfill LF-1 and Subtitle D lined expansion landfill LF-2 as separate units under Title 27 and prescribe appropriate requirements for each (e.g., construction, operation, closure, postclosure maintenance, and corrective action, as applicable). Closure and Postclosure Maintenance Specification E.2, for example, requires that LF-1 be completely closed by **15 October 2018**, while Construction Specification D.5 specifies the Title 27 prescriptive standard and authorized engineered alternative designs for completing closure of LF-1, and Provision H.7 provides a schedule for submission of closure construction reports. Construction Specification D.1 similarly specifies the Title 27 prescriptive standards and authorized engineered alternative designs for the containment system components of new LF-2 expansion modules, including base liner, excavation side slopes, and areas of overlap between LF-1 and LF-2. Provision H.8 requires submission of an Operations and Maintenance (O&M) Plan for the LFG control system to ensure that LFG extracted from the landfill units is handled and disposed of in accordance with the requirements of the WDR requirements, including necessary modifications to discontinue discharges of LFG condensate from LF-1 to LF-2. The revised WDRs also include provisions requiring the Discharger to submit a revised Preliminary Closure and Postclosure Maintenance Plan (PC/PCMP) for LF-2 (Provision H.10) and a Water Quality Protection Standard Report describing the Water Quality Protection Standard for both units (Provision H.7) consistent with the requirements of this Order.

Monitoring

The monitoring and reporting program (MRP) in the WDRs requires regular facility maintenance inspections and semiannual monitoring of the unsaturated zone, groundwater, and surface water for representative monitoring parameters. Leachate, landfill gas, and solid waste monitoring is also required. Monitoring every five years is required for all landfill constituents of concern. The MRP also requires that the Discharger maintain coverage under the General Industrial Storm Water Permit.

Drainage

Surface drainage from the site flows into a network of streams and creeks that meander toward the southwest, ultimately emptying into Mormon Slough. Mormon Slough is partially tributary to the Stockton Diverting Canal, which drains into the Calaveras River, a tributary of the San Joaquin River. The remainder of Mormon Slough flows directly into the San Joaquin River in Stockton. The San Joaquin River discharges into the Sacramento-San Joaquin River Delta northwest of Stockton. (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.)

JANUARY 2012

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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. 97-03-DWQ (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)].