

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER NO. R5-2012-0026

WASTE DISCHARGE REQUIREMENTS  
FOR  
CONSTRUCTION, OPERATION, AND CORRECTIVE ACTION  
SIERRA COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS  
LOYALTON LANDFILL  
CLASS III LANDFILL  
SIERRA COUNTY

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

1. The Sierra County Department of Transportation and Public Works (hereafter "Discharger") owns and operates the Loyalton Landfill, an unlined, active municipal solid waste (MSW) landfill on Garbage Pit Road about 1.25 miles east-southeast of the Loyalton. The landfill is on a 29-acre site in the SW 1/4 of Section 17, T21N, R16E, MDB&M, corresponding to Assessor Parcel No. 016-090-038, as shown in Attachment A, which is incorporated herein and made part of this Order. The geographic coordinates of the site are Latitude 39.6698° north, Longitude -120.2219° west.
2. These revised waste discharge requirements (WDRs) include updated findings and requirements for landfill monitoring and corrective action based on California Code of Regulations, Division 2, title 27 (Title 27). The WDRs also include waste discharge and construction specifications relevant to future expansion of the MSW landfill under Title 27, including required demonstrations for designs proposing less than prescriptive containment of wastes. Previous WDR Order 96-026, which predated Title 27 regulations, no longer adequately describes and regulates the facility.
3. The facility has been in operation since May 1977, accepting household and commercial wastes from the City of Loyalton and outlying unincorporated areas of Sierra County. The facility typically receives between 2,500 to 4,500 tons of waste per year, corresponding to about 12 to 22 tons per operating day. About one-half of all incoming waste is either self-hauled or trucked in from County-operated transfer stations. The other half of the waste stream is collected and hauled by private contractors, including the City's residential and commercial pick-up contractors, Sierra Disposal and Sierra Solid Waste.
4. The facility currently consists of the landfill, precipitation and drainage controls, monitoring systems, access roads, gate house, recyclable material storage structures, and a bin recycling area, as shown in Attachment B, which is incorporated herein and made part of this Order.
5. The landfill currently consists of a single, unlined waste management unit referred to as Landfill 1 (LF-1). LF-1 currently consists of an unlined disposal module on the

northern half of the site, referred to as the Northern Fill Area (NFA), and a small portion of an otherwise undeveloped module on the southern half of the site, referred to as the Southern Fill Area (SFA). Although not currently planned, the SFA may be further developed in the future. LF-1's total footprint consists of about 10.9 acres, including all but the western end of the NFA (10.5 acres) and a small portion (0.4 acres) of pre-2003 trench fill in the eastern end of the SFA developed after completion of NFA trench fill operations in the late 1990s. Because the area of fill in the SFA is small and is not contiguous with fill in the NFA, LF-1's current developable footprint is considered to be limited to the NFA (10.5 acres). See Findings 48 through 52 and Attachment B: Site Map.

#### **SUBTITLE D**

6. 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". See Code of Federal Regulations (CFR), title 40, part 258. Subtitle D regulations apply to all California landfills that have ever accepted MSW as long as they accepted any wastes (MSW or non-MSW) on or after 9 October 1991. Limited exceptions include:
  - a. MSW landfills that ceased accepting wastes prior to the federal deadline (typically 9 October 1993) may only be required to comply with the Closure and Postclosure Care requirements (Subpart F);
  - b. MSW landfills developed prior to the federal deadline may be exempt from the Design Criteria (Subpart D) to the extent of their pre-deadline footprint; and
  - c. Small rural landfills (Subpart A, General) may be exempt from the Design Criteria (Subpart D) if they have not impacted groundwater. See 40 CFR 258.1(f).

See Findings 45, 68, and 69.

7. LF-1 had been operating under the Subtitle D liner exemption for small rural landfills, but lost this exemption upon confirmation of certain groundwater impacts at the site in March 2003. Since then, the Discharger has limited landfill development to vertical expansion over the 2003 footprint so as to avoid the costs of placing a Subtitle D composite liner and LCRS, which would be required for any lateral expansion of the unit. See Finding 47.

#### **WASTE AND UNIT CLASSIFICATION**

8. The landfill accepts wastes defined as "inert" and "nonhazardous" under Title 27, sections 20230 and 20220, respectively. These wastes include MSW as defined in Title 27, Section 20164. The landfill is not authorized to accept any designated or special wastes.
9. The landfill is an existing (i.e., operated on or before 27 November 1984), Class III waste management unit (WMU) per Title 27, Sections 20080(d) and 20260.
10. The landfill waste stream consists primarily of household wastes, commercial wastes,

and construction and demolition debris. Recyclable wastes are diverted to the onsite MRF for processing. Household hazardous wastes are separated and stored for pickup by an authorized contractor. Of the 3,334 tons of waste received at the facility in 2010, approximately 2,559 tons was discharged to the landfill, while another 785 tons of waste was recycled. As of 31 December 2010, a cumulative total of about 86,366 tons (230,310 in-place cubic yards) of waste had been discharged to the landfill, excluding cover (164,250 tons or 438,000 cubic yards), representing about 52.5 percent of the estimated landfill capacity based on the 21-acre planned footprint.

11. As of 31 December 2010, the maximum and average thicknesses of the landfill waste column were estimated to be about 50 feet and 22 feet, respectively. The lowest elevation of waste in the landfill is the base of the landfill toe on the western side of the site (about 5010 feet MSL).

### **SITE DESCRIPTION**

12. The site is located on the southeastern edge of the Sierra Valley in the eastern Sierra Nevada Mountains. The local topography generally consists of gently sloping foothill terrain. The site slopes from east (5,070 feet MSL) to west (5,010 feet MSL) at about a three percent grade. The average site elevation is about 5,040 feet MSL.
13. The landfill was sited in the eroded trough of an intermittent stream that flowed west across the site prior to landfill development. Differences between the current and original site topography reflect changes associated with landfill development. See Attachment B: Site Map.
14. Land surrounding the facility is generally open range scrub land vegetated with low-lying sage brush. Surrounding land uses are generally limited to open space and agricultural (e.g., livestock grazing, stock watering).
15. A 2011 Department of Water Resources (DWR) well survey conducted by the Discharger's consultant identified a total of 9 active domestic supply wells within a one mile radius of the site. One industrial supply well (also used as a landfill monitoring well) that services the County's maintenance yard was also identified adjacent to the landfill facility. Of the 10 supply wells identified in the survey, only the onsite supply well is within 1,000 yards of the facility. The City of Loyalton obtains its drinking water from two municipal supply wells and one spring source in the Loyalton area. The closest of these sources is approximately 1.3 miles west of the facility.
16. The site is not within a 100-year floodplain based on the Federal Emergency Management Agency's Flood Insurance Rate Map, Community Panel Number 06091C0095B, effective June 8, 1998.

### **SURFACE AND STORM WATER**

17. The site drains to one of several intermittent streams originating in the mountains east of the site. This stream, about 100 yards south of the site, flows to Smithneck Creek (one mile to the SW); then to the Middle Fork of the Feather River (west of Little Last

Chance Creek); the Feather River (including Lake Oroville); and thence to the Sacramento River. See Attachment A.

18. 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 (SWRCB).
19. The beneficial uses of the Middle Fork of the Feather River (between Little Last Chance Creek and Lake Oroville) are municipal and domestic supply; water contact recreation; non-contact water recreation; warm freshwater habitat; cold freshwater habitat; spawning, reproduction and/or early development; and wildlife habitat.
20. The average annual precipitation at the site is estimated to be 19.5 inches based Rainfall Depth Duration Frequency data provided by the State Department of Water Resources.<sup>1</sup> The 100-year, 24-hour precipitation event at the site based on this data is estimated to be 4.3 inches.<sup>1</sup> Most precipitation at the site falls in the form of snow. The estimated mean Class A pan evaporation rate is estimated to be between 49 and 68 inches per year.<sup>2</sup>
21. An earthen dam (constructed on the upstream side of the site prior to landfill startup in 1977) diverts the intermittent stream around the landfill via an earthen channel to the southern side of the site. The channel discharges to the intermittent stream south of the site that drains the area.
22. Storm water runoff (including snowmelt) from the landfill top deck (4% grade) and side slopes (4H:1V) is captured in an unlined ditch that runs along the north side of the main access road. The ditch flows to the west, discharging via a culvert near the facility entrance into the native drain that originally traversed the site. The native drain discharges west of the site boundary into the same intermittent tributary into which its upstream portion had been diverted. The SFA (currently used as a borrow area) drains similarly to the NFA, except that it drains to the northwest to a ditch along the southern side of the main access road. The Discharger is in the process of grading the SFA to drain southwest to the intermittent tributary. Seasonal monitoring of storm water discharges from the site is conducted under the General Industrial Storm Water Permit. See Attachment B: Site Map.
23. All landfill drainage facilities, including overside drains, perimeter ditches, pipelines, culverts, and outfall were designed to handle a 24-hour, 100-year storm event.

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1. Precipitation estimates based on linear interpolation of available data from nearby weather stations, including the Vinton Station (11 miles to north) and Sierraville Station (9 miles to southwest).

2. Based on available data from weather stations within 50 miles of facility (i.e., Lake Spaulding, Vinton, and Flemming Stations).

## GEOLOGY

24. The Sierra Valley is a Pleistocene age lake basin shaped over geologic time by extensive faulting and glacial action. The site lies on broad alluvial fan deposits of the Bald Mountain Range in the southeastern part of the valley. Soil and rock types in the area generally consist of Quaternary sediments (i.e., debris flows, stream alluvium, glacial till and lake deposits) to about 200 feet bgs. Underlying this upper layer are Tertiary volcanic deposits (e.g., tuffs) and then metavolcanic Jurassic and Cretaceous-age basement rock (e.g., granite).
25. The Sierra Valley is one of the most heavily faulted areas of California. The closest historically active fault zone to the site is the Mohawk Valley Fault Zone (late Quaternary) about 9.3 miles to the west-SW. Other Quaternary fault zones proximate to the site include the Polaris (12 miles to the south), Dog Valley (8.7 miles to the SE), and Last Chance (8.7 miles to the east) Fault Zones. Additional pre-Quaternary fault zones have been mapped closer to the site, including the Grizzly Valley and Hot Springs fault zones. There are no known Holocene faults within 1000 feet of the facility.
26. The maximum probable earthquake (MPE) for the site is estimated to be about 6.0 on the Richter Scale based on historically-recorded earthquakes in the area, including 6.0 magnitude earthquakes in the Mohawk Valley (1888) and Dog Valley (1948 and 1966) Fault Zones. A maximum magnitude earthquake of 6.3 and a peak horizontal ground acceleration of 0.32g were computed for the site using a probabilistic approach.<sup>3</sup>
27. A 1975 United States Department of Agriculture soil survey classified most of the surface soils at the site as Badenaugh series. Such soil consists of medium to high permeability cobbly and sandy loams.<sup>4</sup> A 1973 soil boring investigation indicated that the site is underlain by laterally discontinuous sand and gravel lenses interbedded with low permeability silts and clays. The investigation included the installation and logging of 7 shallow soil borings at the site. Sieve testing of 17 samples collected within the upper 20 feet showed an average of 44% of materials passing the #200 sieve. Testing of two undisturbed, fine-grained (silty sand) samples indicated laboratory permeabilities of  $1 \times 10^{-6}$  cm/sec and  $2 \times 10^{-8}$  cm/sec, respectively. See SWAT report, page 20. Below 85 feet bgs, the soil generally consists of unconsolidated lake bed deposits, primarily silts and clays.

## UNSATURATED ZONE

28. The capillary rise in the unsaturated zone is estimated to range up to at least 3.3 feet based on soil type.

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

4. See report Soil Survey of *Sierra Valley Area, California, Parts of Sierra, Plumas and Lassen Counties*, U.S. Department of Agriculture, Soil Conservation and Forest Service, October 1975.

29. The minimum separation of waste from highest measured groundwater is estimated to be about 22 feet.
30. As part of a 1989 Solid Waste Assessment Test (SWAT) investigation, two lysimeters (LYS-2 and LYS-3) were installed west of the landfill footprint near wells MW-2 and MW-3. Subsequent sampling of the lysimeters showed the following results for volatile organic compounds (VOCs) in soil pore liquid:

1989 Lysimeter Monitoring Results		
Constituent	Concentration	
	<u>LYS-2</u> <sup>1,2</sup>	<u>LYS-3</u> <sup>3</sup>
VOCs, µg/L		
Ethyl benzene	----	ND -1.3
Xylenes, total	----	ND - 1.3
Methylene chloride	ND	21 - 290
1,1,1-Trichloroethane	ND	ND -1.5

1. "----" means constituent not included in sample analysis.
2. Based on one sampling event conducted in July 1989.
3. Based on two sampling events conducted in May 1989.

No lysimeter monitoring has been conducted at the site since completion of the SWAT investigation and the lysimeters installed as part of the SWAT have since been destroyed or are no longer operable. These WDRs require lysimeter installation and monitoring for any lined lateral expansion of the landfill. See Construction Specification C.7.c and MRP Section F.

#### Gas Monitoring

31. In 1991, as part of an air quality SWAT required by the California Air Resources Board, the Discharger installed four perimeter gas monitoring wells (GPs-1 to 4) at the landfill. Each well was installed within about 29 feet of the landfill waste boundary and screened from 2 to 14 feet bgs. An additional gas monitoring well (GP-5) and a temporary gas probe (later abandoned) were also installed in waste within the landfill unit. TO-14 analysis of the in situ well and probe showed relatively low concentrations of several VOCs in landfill gas, including, but not limited to, tetrachloroethylene (PCE) at 353 ppbv and trichloroethylene (TCE) at 495 ppbv. PCE was also detected in two of the perimeter wells at much lower concentrations (< 30 ppbv). No other VOCs were detected in the perimeter wells. Gas well GP-4 was subsequently destroyed in landfill operations.
32. In June 2011, CalRecycle staff installed three soil gas vapor probes (SGVPs-1 to 3) to a depth of approximately 10 feet along the perimeter of the landfill unit. Subsequent monitoring of the gas wells and probes indicated methane in excess of 5% by volume in probes GP-2 and SGVP-3. The Discharger recently installed additional gas probes along the site perimeter to investigate the extent of these LFG impacts and develop a mitigation plan under the direction of the LEA. See Attachment C: Gas Monitoring.

MRP Section E requires that the Discharger monitor all gas wells and probes installed in or through landfill waste, and along the perimeter of the landfill unit, including MW-4, a dry groundwater monitoring well. Monitoring is required for common LFG gases (e.g., methane, carbon dioxide) and, where indicated by field monitoring, for VOCs. See MRP Section E.2, Footnote 1.

## GROUNDWATER

33. The beneficial uses of the ground water at the site are municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply.
34. The upper water-bearing zone (UWBZ) at the site occurs in alluvial stream bed and debris flow deposits described in Finding 27. Due to the limited connectivity and the presence of fine-grained strata, the UWBZ is believed to be confined or semi-confined in most locations. The depth to groundwater ranges from about 39 to 85 feet bgs depending on well head elevation and location. Groundwater elevations typically range from about 4,998 feet MSL upgradient to about 4,974 feet MSL down gradient (NW corner of the site), with generally less than +/- 2 feet of seasonal variation in each well. The average groundwater gradient is about 0.014 ft/ft. The groundwater flow direction is generally toward the west-northwest on the eastern half of the site and toward the north-northwest on the western half of the site. The average groundwater flow velocity is estimated to range from about 0.2 ft/yr to 15 ft/yr.<sup>5</sup>
35. There are currently six groundwater monitoring wells at the site (MWs-2, 3, 5, 6, 7, and MY), all screened in the UWBZ. See Attachment B. MW-6 is an upgradient well; MWs-3 and 5 are side gradient wells; and MWs-2, 7 and MY are down gradient wells. MW-2 was installed between trenches within the western edge of the NFA footprint. All wells except MW-MY are screened in the upper portion of the UWBZ. MW-MY, a former maintenance yard supply well, is screened in the middle portion of the UWBZ. Another well historically screened in the middle portion of the UWBZ, MW-5 (old), was abandoned in October 2009 after damage to the well was discovered. (See April 2010 report *Monitoring Well MW-5 Replacement Work*, prepared by Avalex Inc.) The replacement well, MW-5, was screened in the upper portion of the UWBZ. Two other monitoring wells, MWs-1 and 4 were screened too high (i.e., above the UWBZ in the unsaturated zone) and have been historically dry. One of these wells, MW-4, is now used for soil gas monitoring. See MRP Section E.1 and Attachment C.
36. Low concentrations of VOCs have been historically detected in groundwater at the site since 1999. The range of historical VOC concentrations is summarized as follows:

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5. Estimated flow velocities based on permeability ranging from  $1 \times 10^{-6}$  cm/sec to  $k = 1 \times 10^{-4}$  cm/sec and porosity ranging from 10% to 25%.

Constituent	1999 to 2010			
	VOC Concentration Range (µg/L) <sup>1</sup>			
	Down Gradient			Side Gradient
<i>Commonly Detected:</i>	<u>MW-2</u>	<u>MW-7</u>	<u>MW-MY</u>	<u>MW-5 (Old)</u> <sup>2</sup>
Dichlorodifluoromethane (Freon 12)	0.3 - 0.5	0.6 - 1.2	1.1 - 9.5	1.3 <sup>3</sup>
Methyl t-butyl ether (MTBE)	---	---	---	0.6 - 3.8
<i>Sporadically Detected:</i>				
Acetone	---	---	---	11 - 88
Benzene	---	---	---	0.8 <sup>3,4</sup>
Chloroethane	---	---	---	4.6 <sup>3</sup>
Cis-1,2-Dichloroethene	---	---	---	2.5 – 8.6
1,1 Dichloroethane	---	---	0.2 <sup>3</sup>	1.2 <sup>3</sup>
Tetrachloroethane	---	---	---	1.8 <sup>3,4</sup>
Tetrachloroethene	---	---	---	6.7 <sup>3,4</sup>
1,1,1-Trichloroethane	---	---	---	1.2 - 4.0
Trichloroethene	---	---	---	2.8 <sup>3,4</sup>

1. “--- “ denotes non-detect.
2. Old MW-5 well abandoned in 2009.
3. Constituent detected in this well only one time during 10 year period.
4. Concentration exceeded applicable water quality limits (e.g., California Public Health Goal).

Four of the VOCs (benzene, tetrachloroethane, tetrachloroethene, and trichloroethene) were sporadically detected above applicable water quality limits. Dichlorodifluoromethane (Freon 12), the most commonly detected VOC, was detected well below water quality limits in all wells. Other VOCs were sporadically detected at low to trace concentrations.

37. In March 2003, Board staff issued a letter to the Discharger requesting an Amended Report of Waste Discharge (RWD) to establish an Evaluation Monitoring Program (EMP) to investigate the nature (i.e., source) and extent of the VOC release per Section 20415(k)(5) of Title 27. A review of the files indicates that the EMP was never formally submitted. The Discharger did comply with staff’s September 2002 request to install an additional monitoring well (MW-7) along the northern perimeter of the landfill, however. Monitoring results for this well showed low to trace concentrations of Freon 12 in the UWBZ at this location, but no other VOCs (see above table).
38. Notwithstanding the above historical data showing low-level VOC impacts to the UWBZ, no VOCs have been detected in any of the wells at the site since the Second Half 2008. It therefore appears likely that the VOC impacts are attenuating naturally. Given this apparent trend, the implementation of active corrective action measures under Section 20430(c) to address the release does not appear to be warranted. WDR Provision I.14 requires that the Discharger submit a technical report containing a work plan and schedule to evaluate the possible source(s) of these VOC impacts (i.e., leachate, LFG) and implement any operational improvements or passive corrective

action measures, as feasible, to mitigate such source and/or prevent future impacts.

39. To demonstrate that corrective action has been completed (i.e., the UWBZ returned to compliance with the water quality protection standard), Monitoring Specification G.13 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. For the purpose of demonstrating that the facility has re-qualified for a Subtitle D liner exemption, Discharge Specification B.6.c specifies that the corrective action proof period commence on 1 January 2009 (i.e., beginning of first consecutive semiannual monitoring period in proof period) and end no earlier than 31 December 2012 (e.g., last day of eighth consecutive semiannual monitoring period in proof period).
40. MRP No. R5-2012-0026 requires concurrent detection and corrective action monitoring consistent with the monitoring specifications of the WDRs and Section 20385(c). The WDR monitoring specifications also allow the Discharger to use certain non-prescriptive data analysis methods considered to be more stringent than Title 27 standards because they have higher effectiveness in detecting a release. Such methods include the *Gamma 95 Percent Upper Prediction Limit* (Gamma 95% UPL) and *Paired Difference Analysis* statistical methods, and the *California Nonstatistical Data Analysis Method*. See Information Sheet.

### LANDFILL OPERATIONS

41. With the exception of the small (0.4 acre) area of trench fill identified in the SFA, landfilling at the site has been historically limited to the NFA. The fill sequence has generally been from east to west. Disposal operations included both the area fill method and trench fill methods. In March 2003, trench filling operations were discontinued and since then area fill operations have been limited to vertical expansion. Both methods are summarized in the findings below.
42. Trench fill operations were conducted during wet months, typically January through April when area fill operations were not feasible due to conditions. Each trench was typically about 300 feet long (E-W), 30 feet wide (N-S), and the approximate depth of adjacent area fill. Trenches were filled over 2 to 3 years. Wastes were spread, compacted and covered similar to area fill operations (see below), while intermediate cover was applied between wet seasons and upon completion of each trench. Trenches were cut along the northern and southern trough slopes, and on the western side of, the NFA. After completion of trench filling operations in the NFA in the late 1990s, a small area of trench fill was developed in the SFA in the early 2000s, as noted in Finding 5.
43. Area fill operations were historically conducted only during dry months, typically May through December. Waste was placed in two foot layers, compacted, and covered with daily cover soil maintaining a refuse to soil ratio of about 4:1. Each disposal cell was sized for the approximate amount of waste to be discharged in a single dry season. Cells were winterized by grading and placement of two feet of cover soil.

Upon completion, each cell was about 120 feet long (E-W), 150 feet wide (N-S), and 8 feet high (including cover). Additional cell layers were built up over time by lateral and vertical expansion. Since discontinuation of trench filling in 2003, area filling has been conducted on a year round basis, albeit limited to vertical expansion.

## LANDFILL CONSTRUCTION

### Siting and Design

44. Previous WDR Orders did not require that the landfill be constructed with a liner and LCRS, and no such facilities were constructed. For example, WDR Order No. 74-362 found that conditions at the site, as modified by diversion of surface flows and other features, were adequate to protect surface and groundwater from impairment by landfill wastes under former Subchapter 15 regulations. WDR Order 90-143 included a liner requirement, but allowed the Discharger to demonstrate the adequacy of natural geologic materials in lieu of placing a liner and LCRS.
45. WDR Order No. 96-026 did not specifically address the adequacy of natural geologic materials under Chapter 15 regulations and did not include any liner requirements. The 1996 WDRs further found that the landfill qualified for the small rural landfill liner exemption under Subtitle D.<sup>6</sup> Requisite findings for the exemption (e.g., low tonnage, no groundwater contamination, no practical alternative, precipitation) were included in the 1996 WDRs. See also Finding 6.c herein.
46. The unlined subgrade of the northern fill area (NFA) was prepared as area fill cells were developed. About a 4.4% grade was maintained from the eastern end (5054 feet MSL) of the unit to the western end (5012 feet MSL) of the unit as soil was excavated. The interior side slopes of the module were excavated along the trough to accommodate landfill development, maintaining a relatively constant base elevation at each cross section along the trough. Perimeter trenches (approximately the same depth as the area fill cells) were incorporated into the footprint over time by stair step lateral expansion of area fill cells. Soil recovered in grading operations was used as operational cover.
47. In a 13 March 2003 letter, Board staff notified the Discharger that the landfill unit no longer qualified for the Subtitle D liner exemption, based on evidence of volatile organic compounds (Subtitle D hazardous constituents) in groundwater at the site (see Finding 36). The letter indicated that any expansion of the landfill beyond existing waste boundaries would require a Subtitle D containment system and

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6. 40 CFR Section 258.1(f) states, in part:

- (i) *Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions that dispose of less than twenty (20) tons of municipal solid waste daily, based on an annual average, are exempt from subpart D of this part, so long as there is no evidence of groundwater contamination from the MSWLF unit and the MSWLF unit serves:*
- (i) *A community that experiences an annual interruption of at least three consecutive months of surface transportation that prevents access to a regional waste management facility, or*
- (ii) *A community that has no practicable waste management alternative and the landfill unit is located in an area that annually receives less than or equal to 25 inches of precipitation .*

requested a Title 27 performance demonstration for any proposed liner system.<sup>7</sup> The letter also requested that the Discharger survey and document the existing landfill footprint.

48. An October 2003 topographic survey conducted in response to the letter 3 March 2003 letter indicated that the March 2003 landfill footprint consisted of 10.1 acres of the NFA and 0.2 acres of the SFA, about half of the planned 21-acre development area. Additional fill areas were subsequently identified, including 0.4 acres of pre-1996 trench fill in the SW corner of the NFA and 0.2 acres of pre-2003 trench fill in the SE corner of the SFA. While the addition of these areas enlarged the total March 2003 footprint to 10.9 acres, only the portion of the footprint within the NFA (10.5 acres) was considered (vertically) developable due to the small size of the SFA footprint. Limited to vertical expansion of the NFA, the estimated landfill capacity was reduced from 186,000 tons to 109,500 tons and the life of the landfill from 2043 to 2016 based on the most recent estimates provided by the Discharger.
49. Since March 2003, approximately 23,000 tons of waste has been discharged to the NFA, increasing the average height of the landfill (by about 8 feet) to 5073 feet MSL and the current peak elevation to 5088 feet MSL, including cover. The current peak elevation exceeds the maximum vertical limit specified in the in the facility's Solid Waste Facilities Permit and approved PC/PCMP (5080 feet MSL) by 8 feet. At the current rate of filling, it is anticipated that the landfill will reach maximum approved closure grades (i.e., capacity) in two years within the existing footprint. The Discharger is in the process of applying to the LEA for an increase in the maximum permitted elevation of the landfill, however. If approved, this increase would allow for an additional two years of disposal capacity at the site. See also Finding 52.d.

#### Grading and Drainage

50. The landfill top deck is graded at about 4% from NE to SW. The steepest exterior side slopes are 4H:1V and the steepest operating slopes are 1.75H:1V. The northern excavation slope (about 35 feet high) is about 1.6H:1V and the southern excavation slope (about 22 feet high) is near vertical.
51. The landfill currently drains by sheet flow to an unlined perimeter ditch on the southern side of the main (E-W) access road that divides the northern and southern fill areas. Culverts capture and convey flows under the road. The remainder of the site is graded to direct sheet flows away from structures and staging areas toward the ditch. The ditch flows west and outfalls to the downstream end of the dry wash in which the landfill was sited.

#### Future Development

52. Plans for future development of the landfill depend on several factors, such as follows:

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7. The letter also requested that the Discharger submit an amended Report of Waste Discharge for an evaluation monitoring program. See Finding 37.

- a. Whether the landfill can re-qualify for the Subtitle D liner exemption. To re-qualify for the exemption, the landfill would need to successfully complete a corrective action proof period per Discharge Specification B.6.c. Regaining the exemption would enable full development of the 21-acre LF-1 area, as anticipated in the 2000 PC/PCMP (see Finding 53).
- b. Whether any proposed lateral expansion could meet Title 27 waste containment requirements even if the landfill regained the Subtitle D liner exemption. At a minimum, a Title 27 prescriptive clay liner (or approved engineered alternative) would be required for such expansion, unless the Discharger was able to demonstrate the adequacy of natural geologic materials for containment of wastes.
- c. Whether adequate on or offsite borrow soil is available to support construction, operations, and closure needs associated with any lateral and/or vertical expansion of the landfill.
- d. Whether the Discharger is able to get approval from the LEA for increased vertical limits for the landfill. Increased vertical limits would allow the landfill to operate within the existing footprint longer, providing more time to complete corrective action, make demonstrations for any lateral expansion, and/or evaluate other disposal alternatives. The Discharger has indicated that in its current application for an updated solid waste facilities permit, it will request that the vertical limit be increased to 5092 feet MSL. Assuming filling remains limited to the existing footprint, such increase would extend the life of the landfill to the year 2016.

### **CLOSURE AND POSTCLOSURE MAINTENANCE**

53. On 17 May 2000, Central Valley Water Board staff approved an April 2000 Revised Preliminary Closure and Post-Closure Maintenance Plan (PC/PCMP) for the landfill.<sup>8</sup> The PC/PCMP assumed that the landfill would be closed as a single, unlined unit over the 21-acre fill area authorized in the 1996 WDRs. Proposed final closure activities included grading, final cover installation; installation of landfill controls and monitoring systems relevant to postclosure (e.g., precipitation and drainage, LFG, monitoring wells); decommissioning of facilities; and other closure-related activities.
54. The PC/PCMP proposed that, after final operational grades (including intermediate cover), the landfill would be closed with a cover meeting the prescriptive requirements of Title 27, including the following, from top to bottom:
  - a. Two feet of vegetative cover soil (Title 27 requires only 1 foot)
  - b. One foot of compacted low permeability soil ( $k < 1 \times 10^{-6}$  cm/sec);
  - c. Two feet of foundation soil (including existing intermediate cover soil).

Borrow soil for the cover would be obtained from approved onsite and offsite sources. See June 1999 *Loyalton Landfill Borrow Site Investigation*, prepared by Avalex, Inc.

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8. The original PCP/PCMP, dated 16 September 1999, was submitted to the Local Enforcement Agency as part of an application for a revised Solid Waste Facilities Permit.

55. The PC/PCMP proposed that the closed landfill would have a broad top deck covering most of the landfill unit area. The top deck would be graded from the NE corner of the unit to the SW corner of the unit at a uniform grade of about 3.5%. The NE corner of the top deck (5080 feet MSL) would be about 10 feet above surrounding grade (5070 feet MSL), while the SE corner of the top deck (5050 feet MSL) would be about 30 feet above surrounding grade (5020 feet MSL). The side slopes would be graded at 4H:1V.
56. Precipitation and drainage controls for the landfill proposed in the PC/PCMP included the following:
- Top deck and side slope grading for drainage and erosion control;
  - Diversions soil berm (2 feet in height) along the south and west (i.e., downslope) perimeters of the top deck to direct sheet flows to overside drains;
  - Three overside drains (18 inch corrugated metal pipe) on the southern perimeter (including the SE corner) of the top deck to convey diverted runoff to perimeter ditches;
  - Two rip rap and filter fabric lined "V" ditches (each about 12 feet wide x 2 feet deep) along the northern and southern sides of the unit to capture and convey flows from the overside drains and sheet flow runoff from landfill side slopes;
  - Two culverts under main access road to direct flows from each ditch to intermittent stream channel in SW corner of site.

The proposed landfill drainage controls were in addition to the site diversions measures described in Findings 13 and 21. All precipitation and drainage controls proposed for the landfill were designed to accommodate flows from a 100-year, 24-hour storm event.

57. Provision I.9 requires that the Discharger submit a revised PC/PCMP that reflects the requirements under these WDRs, including MRP No. R5-2012-0026, and future plans for landfill development.

## **COST ESTIMATES AND FINANCIAL ASSURANCES**

### **Closure and Postclosure Maintenance**

58. The Discharger is required to demonstrate financial assurances for closure and postclosure maintenance to CalRecycle pursuant to solid waste Sections 22205 and 22212(a), respectively.<sup>9</sup> Section 22206 requires that the closure financial assurances be, at a minimum, in the amount of the current closure cost estimate.
59. Total estimated costs of closure and postclosure maintenance provided in the approved PC/PCMP were \$2,056,196 and \$895,992, respectively, in 2010 dollars. Both estimates were based on closure over a 21-acre footprint per the original development plan in previous WDRs.

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9. Sections 22205 and 22212(b) apply to all solid waste landfills permitted under Chapter 4 that have, or will be, operated after January 1, 1988.

60. In 1991, the Discharger established an enterprise account (Sierra County Board of Supervisors Resolution No. 91-319) as the funding mechanism for closure and postclosure financial assurances for the landfill.<sup>10</sup> As of December 2010, the enterprise account had a combined balance of **\$1,097,910**.
61. Section 22225 provides a formula for determining the minimum deposit requirement for funding an enterprise account or trust fund mechanism. Funding requirements are generally proportionate to the fraction of permitted landfill capacity filled. The following table provides estimates for closure and postclosure maintenance funding requirements under the May 2000 PC/PCMP.

**Estimated Closure and Postclosure Funding Requirements**

<u>Parameter</u>	<u>May 2000 PC/PCMP</u>	
Footprint (acres)	21	
Cost Estimate (\$2010)		
Closure	2,056,196	
Postclosure Maintenance	895,992	
Total	2,952,188	
Fill Status	<i>Total</i>	<i>Permitted<sup>1</sup></i>
Capacity (tons)	186,000	165,827
Fill (tons)	86,238	66,065
% Capacity	46.4	39.8
Min Required Balance (\$2010) <sup>1</sup>		
Closure	819,183	
Postclosure Maintenance	356,961	
Total	1,176,143	
Actual Balance (\$2010)		
Closure	764,693	
Postclosure Maintenance	333,217	
Total	1,097,910	

1. Minimum balance calculations apply only to landfill operations conducted after 18 August 1989 (e.g., effective date of regulation). See Section 22200.

Provision I.9 requires that the PC/PCMP be revised to include updated cost estimates, as necessary under these WDRs, for closure and postclosure maintenance, including monitoring. Provision I.10 requires that the Discharger provide and maintain financial assurances to the CalRecycle in at least the amount of these updated cost estimates, as approved by the Central Valley Water Board (i.e., by maintaining the minimum balances for each fund as approved by CalRecycle).

10. See 21 November 1991 letter *Certification for the Establishment of a Financial Assurance Resolution for the Closure and Postclosure Maintenance of the Pilot Landfill*, from Tim Beals to CalRecycle.

62. Pursuant to 27 CCR sections 22101 and 22220, respectively, the Discharger is required to provide cost estimates and demonstrate financial assurances to CalRecycle for initiating and completing corrective action for all known and reasonably foreseeable (KRF) releases from the landfill. Sections 22101(a) and 22220(a) require that the Discharger provide cost estimates and financial assurances for KRF releases from the landfill to water (i.e., “water release”) consistent with water quality Section 20380(b). Sections 22101(b) and 22220(b) require that the Discharger provide cost estimates and financial assurances for replacement of final cover as a corrective action for a “non-water” KRF release from the landfill, such as caused by a natural event (e.g., earthquake, flood).<sup>11</sup>
63. Section 22221(b) requires that, with the exception of minimum balance requirements, required corrective action financial assurances be in at least the amount of the greater of:
  - a. The most recently approved (or most recently submitted) corrective action cost estimate prepared pursuant to Section 22101(a) for a water release; or
  - b. The most recently approved (or most recently submitted) corrective action cost estimate, prepared pursuant to Section 22101(b) for a non-water release.
64. In July 1995, the Discharger established an enterprise fund for corrective action financial assurances, funded by annual allocations of \$6,400 per year (in 1995 dollars) from the County’s solid waste budget. In 1998, the County Board of Supervisors informally agreed to increase the allocation to about \$7,000 per year (in 1998 dollars) with a goal of funding the account up to about \$205,000 (in 1998 dollars). CalRecycle subsequently acknowledged this amount (\$258,658 in 2010 dollars) as an acceptable cost estimate for corrective action.<sup>12</sup> As of October 2010, the enterprise account had a balance of \$197,693 in 2010 dollars.

Notwithstanding the above, no cost estimates for corrective action financial assurances have yet been formally proposed by the Discharger or approved by either Central Valley Water Board or CalRecycle staff. A 21 July 1999 letter report submitted by the Discharger (in response to 5 March 1999 Central Valley Water Board staff request for a corrective action financial assurances demonstration) included summaries of potential corrective action scenarios and corresponding costs, but did not evaluate probability of occurrence or propose a specific corrective action cost estimate for funding purposes.

Provision I.7 requires that the Discharger provide an updated corrective action cost estimate, as necessary to comply with these WDRs and Title 27 requirements, including solid waste Sections 22101 and 22220. Provision I.8 requires that the Discharger provide and maintain financial assurances to the CalRecycle in at least the amount of these cost estimates, as approved by the Central Valley Water Board (i.e.,

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11. Solid waste section financial assurance requirements for “non-water” release may or may not exceed the scope of funding required for “water-release” under water quality Section 20380(b).

12. See 17 December 2010 email *Financial Assurances for Loyalton Landfill, Facility No. 46-AA-0001*, from Elizabeth Castaneda, CalRecycle to Craig Morgan, Avalex, Inc.

by maintaining the minimum balances for each fund as approved by CalRecycle).

### **CEQA AND OTHER CONSIDERATIONS**

65. The action to revise the WDRs is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21000, et seq.), in accordance with Title 14, CCR Section 15301 for existing facilities.
66. A final EIR for landfill development (*Final Environmental Impact Report for Loyalton Sanitary Landfill*, prepared by Harding Lawson Associates) was completed in 1973 and subsequently certified by the Sierra County Board of Supervisors.
67. Section 13267(b) of California Water Code (CWC) 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." The technical reports and monitoring and reporting program required by this Order (MRP No. R5-2012-0026, attached) 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.
68. On 17 June 1993, the SWRCB adopted, and on 21 July 2005 amended, SWRCB Resolution No. 93-62 implementing a State policy for the construction; monitoring; and operation of MSW landfills consistent with the federal Subtitle D regulations. Title 27 incorporates SWRCB Resolution No. 93-62.
69. This Order implements:
  - a. *The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition*;
  - b. Chapters 1 through 7, Subdivision 1, Division 2, Title 27, of the California Code of Regulations, effective 18 July 1997, and subsequent revisions;
  - c. The prescriptive standards and performance criteria of RCRA Subtitle D, Part 258; and
  - d. SWRCB Resolution No. 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*, adopted 17 June 1993 and amended 21 July 2005.

### **PROCEDURAL REQUIREMENTS**

70. 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.

71. The Central Valley Water Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
72. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.
73. Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and title 23, CCR, sections 2050 et seq.. 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](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 No. 96-026 is rescinded, except for purposes of enforcement, and that the Sierra County Department of Transportation and Public Works, its 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. Discharge to the landfill of the following types of wastes (as defined in Title 27, Section 20164) are prohibited:
  - a. Hazardous waste (i.e., waste required to be managed in accordance with title 22, Division 4.5, CCR).
  - b. Designated waste (see CWC, Section 13173).
  - c. Special Wastes (see Title 22, Section 66261.124)
2. The discharge of wastes outside of a landfill unit, or portions thereof specifically designed for their containment, is prohibited.
3. The following discharges of liquids, leachate and/or gas condensate liquids to the landfill unit are prohibited:
  - a. Liquids not generated by the landfill unit.

- b. Discharges to any module not constructed with a Title 27/Subtitle D composite liner (or approved engineered alternative design, EAD) and an LCRS.
- c. Any discharge that could result in leachate seeps, excessive head on a liner, or leachate runoff from the unit.
- d. Wet cell operations.

See also General Prohibition V.A and Discharge Specifications VI.D and VI.E, SPRR.

- 4. The following types of discharges to water-bearing media at the site (i.e., groundwater, unsaturated zone, and surface water) are specifically prohibited:
  - a. Solid or liquid waste, including, but not necessarily limited to, MSW and leachate.
  - b. Treated or untreated wastewater or groundwater to surface water in the absence of a National Pollutant Discharge Elimination System (NPDES) permit authorizing the discharge.
  - c. Any discharge in excess of concentration limits or otherwise resulting in a confirmed release under Title 27.
- 5. The landfill shall not cause pollution or a nuisance, as defined by the California Water Code, Section 13050, and shall not cause degradation of any water supply.
- 6. The discharge shall not cause the release of pollutants or waste constituents in a manner that causes a condition of nuisance, degradation, contamination, or pollution of groundwater, unsaturated zone, or surface water to occur, as indicated by the appropriate data analysis method(s) in this Order.
- 7. The discharge shall not cause any increase in the concentration of waste constituents in soil-pore gas, soil-pore liquid, soil, or other geologic materials outside of the Unit if such waste constituents could migrate to waters of the State in either the liquid or the gaseous phase, and cause a condition of nuisance, degradation, contamination, or pollution.
- 8. The waste discharge prohibitions herein shall supersede any conflicting or contradictory provisions in the April 2000 Standard Provisions and Reporting Requirements (SPRR) applicable to waste discharge to an active or closed landfill. See also SPRR Section I.E.

## **B. DISCHARGE SPECIFICATIONS**

- 1. Lateral expansion of the landfill unit (LF-1) shall be limited to the northern and southern fill areas (NFA and SFA), as outlined in Attachment B.
- 2. The discharge of solid waste to the NFA shall be limited to the following:

- a. The existing, 10.5-acre NFA footprint;
  - b. A lateral expansion of the existing NFA footprint constructed with a Subtitle D composite-liner and LCRS or approved EAD consistent with Construction Specifications C.1 through C.5; and
  - c. Vertical expansion over the NFA footprint (existing or expanded) up to a maximum closure grade of 5080 feet MSL (including cover material), or as approved in the updated PC/PCMP submitted under Provision I.9 of this Order and authorized under the Solid Waste Facilities Permit for the facility issued by the LEA.
3. The discharge of solid waste to the SFA shall be limited to the following:
- a. A single landfill module designed and constructed with a Subtitle D composite-liner and LCRS or approved EAD consistent with Construction Specifications C.1 through C.5; and
  - b. Vertical expansion of the above single landfill module (including cover) up to the maximum allowed closure grades specified in B.2.c above.
4. Any proposal for expansion of the landfill inconsistent with Discharge Specifications B.2 and B.3 shall be submitted in the form of a Joint Technical Document (JTD) per Section 21710 et seq. and shall require revised WDRs adopted by the Central Valley Water Board prior to implementation. Such proposals would include, but may not be limited to:
- a. Any proposal to expand LF-1 beyond the NFA and/or SFA;
  - b. Any proposal for vertical expansion of the landfill beyond the limits specified in B.2.c;
  - c. Any proposal for lateral expansion of the landfill based on an exemption from Subtitle D, Subpart D, or otherwise not equipped with the Subtitle D compliant containment system specified in Construction Specifications C.1 through C.5. and
  - d. Any proposal to site and construct a new waste management unit at the facility.
5. Any proposal per Discharge Specification B.4.c for lateral expansion of the landfill in the absence of a Subtitle D compliant containment system shall be accompanied by the following:
- a. If not already made within the 90 days prior to submittal of the JTD, a demonstration under Discharge Specification B.6 that the landfill unit, including any proposed lateral expansion thereof, is exempt from Subtitle D, Subpart D ; and
  - b. A demonstration per Discharge Specification B.7 that the proposed lateral expansion will comply with Title 27 requirements for waste containment applicable to a non-MSW landfill.

### Demonstrations

6. To demonstrate that the landfill unit, including any proposed lateral expansion thereof, is exempt from Subtitle D, Subpart D, the Discharger must show, to the satisfaction of the Board or the Executive Officer, the following:
  - a. That the landfill unit accepts less than 20 tons per day (tpd) of MSW based on an annual average; and
  - b. That the landfill unit serves one of the following:
    - 1) A community that experiences an annual interruption of at least three consecutive months of surface transportation that prevents access to a regional waste management facility, or
    - 2) A community that has no practicable waste management alternative and the landfill unit is located in an area that annually receives less than or equal to 25 inches of precipitation; and
  - c. That, based on data in semiannual monitoring reports submitted under this Order, the unit has successfully completed a 4-year corrective action proof period such that there is no longer any evidence of Subtitle D hazardous constituents (e.g., VOCs and dissolved metals) in groundwater from the unit at the site. For the purposes of this discharge specification, this corrective action proof period shall be deemed to have commenced on **1 January 2009** (i.e., beginning of first consecutive semiannual monitoring period for which these constituents have been reduced to CLs) and shall end no earlier than **31 December 2012** (i.e., end of eighth consecutive semiannual monitoring period for which it can be shown that these constituents have been reduced to CLs). See Monitoring Specification G.13.
7. To demonstrate that a proposed Subtitle D exempt landfill expansion complies with Title 27 requirements applicable to a non-MSW landfill, the Discharger shall show one of the following:
  - a. That the proposed lateral expansion will be equipped with a Title 27 compliant compacted clay liner (or EAD providing equivalent protection) and LCRS; or
  - b. That specified site characteristics, including natural geologic materials, are adequately protective of surface and groundwater such that a prescriptive Title 27 containment system is not required. See Information Sheet.
8. The discharge shall remain within the designated disposal area (see Discharge Specifications B.2 and B.3) at all times.
9. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order.
10. The LCRS sump shall be designed and operated so as to prevent/minimize;
  - a. Leachate backup and head build-up on the base liner/subgrade outside of the sump; and

b. Leachate storage within the sump.

See also Construction Specifications VIII.O and Q, SPRR.

11. Waste discharged within the initial two feet of the unit, or within the initial two feet of any lateral expansion of the unit, as measured from the top of the operations layer over the liner system, shall consist only of “packer waste”; that is, waste free of objects that could potentially cause damage to the liner system, LCRS, and/or engineered subgrade.

**C. CONSTRUCTION SPECIFICATIONS**

1. Absent adoption of revised WDRs authorizing an alternative design for waste containment, any proposed lateral expansion of LF-1 shall, at a minimum, be constructed in accordance with the Construction Specifications C.2 through C.11 of this Order.
2. The containment system for any proposed lateral expansion of LF-1 shall be in accordance with one of the following designs appropriate for an MSW landfill, from top to bottom:

a. Title 27 Prescriptive Standard:

<u>Component</u>	<u>Base Liner</u>	<u>Side Slopes</u>
Operations Layer		Soil
LCRS	1' gravel drainage blanket	
Composite Base Liner	40 mil synthetic FML or 60-mil HDPE <sup>1</sup> ≥ 2' compacted clay soil ( $k < 1 \times 10^{-7}$ cm/sec) <sup>2</sup>	
Foundation Layer	≥ 1' compacted soil <sup>3</sup>	

1. In direct and uniform contact with the underlying clay soil layer.
2. Minimum relative compaction of 90%.
3. See Construction Specification C.5.

b. Engineered Alternative Design

<u>Component</u>	<u>Base Liner</u>	<u>Side Slopes</u>
Operations Layer		≥ 2' soil
Filter Fabric	Geotextile <sup>1</sup>	
LCRS	1' gravel drainage blanket	Geocomposite <sup>2</sup>
Composite Base Liner	60-mil HDPE <sup>3</sup> GCL <sup>4</sup>	
Foundation Layer	≥ 1' compacted soil <sup>5</sup>	

1. 8 oz/yd<sup>2</sup> non-woven fabric.
2. Consists of geonet with overlying and underlying filter fabric.
3. Textured on both sides.
4. 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.

5. See Construction Specification C.5.

3. The LCRS sump for any proposed lateral expansion under Construction Specification C.2 shall, at a minimum, have the following design, from top to bottom:

<u>Component</u>	<u>Specification</u>
Gravel	Particle size
Tank: <sup>1</sup> Volume	Meet performance standards
Pump	Automatic with high and low alarms, flow meter
Filter Fabric	Geotextile
Primary Liner System	Subtitle D Composite or Title 27 CCL, as applicable
Secondary LCRS <sup>2</sup>	1' gravel drainage blanket or Geonet
Secondary Liner System	Same as primary liner system
Foundation Layer	≥ 1' compacted subgrade

1. Sump shall be equipped with an automatic pump, flow meter, and recordation 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. HDPE riser included for leachate monitoring and removal.

4. The Discharger may propose changes to the liner 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 system results in the protection of water quality equal to or greater than the design prescribed by Title 27 and this Order. Such proposed changes shall be submitted for approval by the Executive Officer. Substantive changes to the design, including, but not necessarily limited to, changes affecting the landfill containment system; LCRS; precipitation and drainage controls; final cover; and/or slope stability shall require re-evaluation as an EAD and approval by the Central Valley Water Board.
5. The foundation layer (or subgrade) for the above liner designs shall be constructed in accordance with the following:
  - a. The foundation layer shall consist of fine-grained materials, as follows:
    - 1) A maximum particle size of 3/8-inch;
    - 2) At least 30% of the material, by dry weight, passing the No. 200 U.S. Standard sieve;
    - 3) A gradation series (i.e., well-graded) that is amenable to compaction; and
    - 4) The materials shall have significant clay content and be without organic matter, such as clayey sand (SC), clay (CL), fat clay (CH), sandy or silty

clay under the Unified Soil Classification System.

- b. Foundation layer materials shall be compacted as follows:
  - 1) In lifts of 6 inches or less; and
  - 2) To 90% of maximum dry density at 0 to 4% wet of optimum moisture content, in accordance with the approved CQA plan; and
  - 3) To a minimum hydraulic conductivity of  $1 \times 10^{-5}$  cm/sec
  - 4) Project CQA shall include preparation of the foundation layer/subgrade so as to provide a smooth surface free from rocks, sticks, or other debris that could puncture, damage, or otherwise limit the performance of overlying synthetic components (i.e., liner, LCRS).
6. The design and construction of all landfill module LCRS and containment system components shall incorporate adequate factors of safety to handle the increased vertical loads associated with vertical expansion.
7. The Discharger shall, **at least 90 days** prior to construction of a new module or lateral expansion of an existing module, submit for review and approval the following:
  - a. A construction design report, including plans, drawings and a construction quality assurance (CQA) plan per Section 20324 of Title 27;
  - b. A geotechnical evaluation of the area soils, evaluating their use as the foundation layer;
  - c. A proposed unsaturated zone monitoring system, which is demonstrated to remain effective throughout the active life, closure, and postclosure maintenance periods of the Unit, which shall be installed beneath the foundation layer in accordance with Title 27, Section 20415(d); and
  - d. A revised groundwater detection monitoring program, as necessary, to monitor the new module so as to maintain compliance with Title 27.
8. Construction shall proceed only after all applicable construction and CQA plans have been approved by Executive Officer.
9. No later than 90 days following the completion of construction of a unit or module (or portion thereof), and prior to discharge onto the newly constructed liner system, final documentation required under Section 20324(d)(1)(C) of Title 27 shall be submitted. Such documentation shall contain sufficient information and test results to verify that construction was in accordance with the design plans and specifications, and with the prescriptive standards and performance goals of Title 27. A registered civil engineer or a certified engineering geologist shall certify the report.
10. A third party independent of both the Discharger and the construction contractor shall perform all of the CQA monitoring and testing during the construction of all

landfill liner and final cover systems. See also Construction Specification VIII.S, SPRR.

11. LFG control facilities shall be installed as each new MSW landfill module, or lateral expansion of an existing module, is constructed and developed. Existing modules shall be retrofitted with LFG monitoring systems and controls, if required by the LEA or as warranted as a corrective action measure to address LFG concerns. See Section 20425(d)(3). Installation of LFG facilities shall also be consistent with CalRecycle/LEA requirements under Title 27 (see Article 6, Sections 20918 et seq.).

#### **D. FACILITY SPECIFICATIONS**

##### Operations and maintenance

1. The Discharger shall immediately notify the Board of any flooding, unpermitted discharge of waste off-site, equipment failure, slope failure, or other change in site conditions that could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures. See also Facility Specification VII.D, SPRR.
2. Water and leachate used for facility maintenance shall be limited to the minimum amount necessary for dust control and construction. Any such application of leachate shall be subject to restrictions of this Order applicable to liquid wastes (see Discharge Prohibition A.3).
3. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with this Order, including, but not limited to, the landfill cover, cover grade, containment system, leachate controls, precipitation and drainage controls, monitoring wells, gas extraction system, and related landfill facilities.
4. Methane and other landfill gases shall be adequately vented, removed from the Unit, or otherwise controlled as needed to prevent adverse health effects, nuisance conditions, or the impairment of the beneficial uses of surface water or groundwater due to migration through the unsaturated zone.
5. All wells within 500 feet of the waste management units shall have sanitary seals that meet the requirements of the Sierra County Environmental Health Department or shall be properly abandoned. If not previously done, a record of the sealing and/or abandonment of such wells shall be sent to the Central Valley Water Board and to the State Department of Water Resources.
6. The Discharger shall maintain a copy 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.

7. 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 Regional 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 required monitoring parameters/COCs, and an estimated date that the results will be submitted to the Regional Water Board; and
  - e. Corrective measures underway or proposed, and corresponding time schedule.

#### Storm Water

8. During the rainy season a minimum one-foot thickness of low permeability soil or alternative cover, approved by the Board and by CalRecycle, shall be maintained over all but the active disposal area of the landfill units. The active disposal area shall be confined to the smallest area practicable based on the anticipated quantity of waste discharge and other waste management facility operations. See also Facility Specification VII.B, SPRR.
9. Precipitation and drainage control systems shall be designed, constructed, operated and maintained to convey peak flows from a 100-year, 24-hour storm event. All storm water controls shall be maintained so that they function effectively during precipitation events.
10. Annually, prior to the anticipated rainy season but no later than 31 October, any necessary erosion control measures shall be implemented and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent storm water flows from:
  - a. Contacting or percolating through wastes;
  - b. Causing erosion or inundation of the landfill cover or other areas of site;
  - c. Causing sedimentation and clogging of the storm drains; and/or
  - d. Discharging sediment loads to surface waters.
11. The Discharger shall maintain coverage under the General Storm Water Permit for Industrial Activities.

#### **E. CLOSURE SPECIFICATIONS**

1. Closure or partial closure of the unit shall proceed only after submission of a Final Closure Plan (FCP) or partial FCP meeting the requirements of Section 21769(c)

and adoption of closure WDRs by the Central Valley Water Board.<sup>13</sup> See also Closure and Post-Closure Specification IX.A, SPRR.

2. The Discharger shall at least every five years conduct an aerial survey of the site for the purpose of updating the topographic site map. The first aerial site survey under this Order shall be conducted by **31 December 2012**. A copy of the updated topographic map shall be included in the Annual Monitoring Summary Report. See MRP Section I.2.e.ii. See also Closure and Post-Closure Specification IX.I, SPRR.

## F. WATER QUALITY PROTECTION STANDARD

1. The Discharger shall establish and maintain a Water Quality Protection Standard (WQPS) for the unit consistent with Title 27 requirements and this Order, including MRP No. R5-2012-0026 and the SPRR. The WQPS shall consist of the following elements per Section 20390:

- a. Constituents of Concern (COCs)

All waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the Unit. The COCs for all water-bearing media at the site shall be as specified in MRP Section I.4.b.i.

- b. Concentration Limits (CLs)

- 1) The background value of each monitoring parameter/COC (see Monitoring Specification G.8); or

- 2) A concentration limit greater than background (CLGB), if proposed and approved consistent with Section 20400(c) as part of a corrective action program. Any such CLGB proposal shall:

- i. Be accompanied by requisite Section 20400(c) demonstration 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.

- ii. Require adoption of revised WDRs by the Central Valley Water Board.<sup>14</sup>

The CLs for each water-bearing media at the site shall be as specified in MRP Section I.4.b.ii.

- c. Compliance Points (Section 20405)

All monitoring locations at which the WQPS applies, including the Point of

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13. Any proposal for final cover shall meet the requirements of Title 27 and Subtitle D, including the requirement that the permeability of the low hydraulic conductivity layer 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 Section 21090(a)(2), Title 27; Section 258.60(a)(1), Subtitle D.

14. CLGBs shall be limited to wells within the area of the release as of the start of the corrective action monitoring program under this Order (i.e., date of this Order) absent special application of the California Water Code.

Compliance (POC) as defined in Section 20405<sup>15</sup> and any additional monitoring locations required for compliance monitoring. The compliance points for the unit shall be as listed in MRP Section I.4.b.iii.

d. Compliance Period (Section 20410)

The minimum period during which the Discharger shall conduct a water quality monitoring program subsequent to a release from the Unit. It is equal to the active life of the Unit plus the closure period. The landfill Compliance Period shall be as specified in MRP Section I.4.b.iv.

See also SPRR, Monitoring Specifications X.K through X.M.

2. The WQPS shall be reviewed and updated, as necessary, at least every 5 years. An updated WQPS report shall be submitted in accordance with MRP Section I.4.b.

**G. MONITORING SPECIFICATIONS**

1. The Discharger shall comply with the WQPS and monitoring specifications of this Order and the SPRR, Sections X and X1.
2. For each monitoring event, the Discharger shall determine whether the landfill is in compliance with the WQPS using procedures specified in the Section 20415(e) of Title 27.
3. The concentrations of the COCs in waters passing the Point of Compliance shall not exceed concentration limits established in accordance with this Order.

**Monitoring Programs**

4. The Discharger shall develop and implement field parameter, background, and compliance (including detection, corrective action, and COC) monitoring programs for the landfill as specified in this Order, including in MRP No. R5-2012-0026.

Field Parameter Monitoring

5. The Discharger shall implement a field parameter monitoring program, including, but not limited to, groundwater elevation monitoring, consistent with Section 20415(e), subparagraphs 13 and 15. Groundwater elevation monitoring shall include measurements for determination of groundwater surface elevation, flow direction and flow velocity. Field parameter monitoring shall be conducted concurrent with the other monitoring programs for water-bearing media under MRP No. R5-2012-0026.

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15. Section 20405 defines the Point of Compliance as a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the Unit.

### Background Monitoring

6. The Discharger shall implement a Background Monitoring Program for the unit consistent with Section 20415, including, but not necessarily limited to, subsections 20415 (b), (e)(6), and (e)(10). The goals of background monitoring shall be, for each constituent on the background monitoring list, to:
  - a. Establish and monitor background conditions for each water bearing media relevant to a unit (i.e., groundwater, soil pore water, and surface water);
  - b. Identify any trends or variation that may indicate a change in background conditions, spatial variability, seasonality, or the effects of a release from the unit;<sup>16</sup> and
  - c. Develop concentration limits (CLs) for each water bearing media.
  
7. Background and detection monitoring for inorganic constituents shall be conducted on an interwell basis unless the Discharger is able to make the following demonstration to the satisfaction of the Executive Officer:
  - a. Spatial variability of the groundwater geochemistry exists in the upper water bearing zone at the site such that upgradient monitoring data may not be representative of background conditions for down gradient and side gradient well(s); and
  - b. One of the following:
    - 1) No evidence of a release from the unit has been identified in any of the well(s) proposed for intrawell monitoring, including, but not limited to, the following:
      - i. No significant rising trend (long term or short term) based on statistical trend analysis;
      - ii. No materially significant evidence (MS/E) of a release or potential release per Monitoring Specifications G.24 and G.25, respectively; and/or
      - iii. No physically significant evidence of a release from the unit has been detected that could affect the wells; or
    - 2) Any potential evidence of a release detected in the well is attributable to spatial variability or other cause unrelated to a release from the landfill (e.g., outlier, seasonality, lab error);<sup>17</sup> or
    - 3) Use of the well will be limited to data collected before evidence of a release or potential release occurred.

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<sup>16</sup>. Background data shall be appropriately screened (i.e., for trends, outliers, seasonality) as necessary to ensure that it represents a single statistical population unaffected by a release from the unit or offsite source.

<sup>17</sup>. If potential evidence constitutes measurably significant evidence of a release (MS/E), the Discharger shall follow response to release procedures (e.g., Reporting Specification H.3 and comply with Section 20420(j) in making this demonstration.

8. CLs shall be developed using appropriate background data analysis methods consistent with Monitoring Specifications G.17 through G.21.
  - a. Detection Monitoring
    - 1) Statistical Constituents -- CLs shall be based on interwell background monitoring per Section 20415(e)(10) as follows:
      - i. By reference to historical data, or
      - ii. By use of a formula or procedure for updating such data to reflect changes in background water quality.
    - 2) Nonstatistical Constituents
      - i. Naturally occurring in background – CL shall not exceed the PQL.
      - ii. Non-naturally occurring in background – CL shall not exceed the MDL.
  - b. Corrective Action Monitoring

Same background criteria as in detection monitoring unless CLGBs are proposed.

CLs shall be updated at least annually based on the results of monitoring.

#### Compliance Monitoring

##### Detection

9. The Discharger shall implement a Detection Monitoring Program for the unit, including required background monitoring, consistent with applicable provisions of Section 20415 and Section 20420. The goals of the Detection Monitoring Program shall be to:
  - a. Detect a release from the unit (i.e., new waste constituent crossing Point of Compliance);
  - b. Update the detection monitoring parameter list; and
  - c. Qualify any new corrective action monitoring parameters.
10. The detection monitoring parameter list for a given water-bearing media shall, at a minimum, include the following constituents not already corrective action monitoring parameters (Monitoring Specification G.12):
  - a. Any constituent in the same group (or subgroup) as a listed corrective action monitoring parameter, based on the constituent groupings in MRP Tables J.1.C.b and J.2 (e.g., heavy metal, BTEX compound);
  - b. Any parent compound of a listed organic corrective action monitoring parameter, based on MRP Table J.1.C.b, as updated per Monitoring Specification G.16.
  - c. Any constituent on the COC monitoring parameter list detected in other media (e.g., leachate, LFG, unsaturated zone); and
  - d. Any constituent on the COC monitoring parameter list identified by monitoring

data analysis as potentially associated with a release. See Monitoring Specifications G.24 and G.25.

### Corrective Action

11. For any unit with a confirmed release, the Discharger shall implement a concurrent corrective action monitoring program for the unit, including required background monitoring, consistent with applicable provisions of Sections 20385, 20415 and Section 20430(d). The goals of the corrective action monitoring program shall be as follows:
  - a. Complete evaluation monitoring (as necessary);
  - b. Track changes in water quality associated with the release (including any new constituents added through the Detection Monitoring Program); and
  - c. Monitor the effectiveness of corrective action measures in returning to the WQPS.
12. The corrective action monitoring parameter list for a given water-bearing media shall include:
  - a. Any constituent historically confirmed as part of the release in one or more landfill compliance wells;
  - b. Any constituent confirmed as part of the release under either the detection or COC monitoring programs under the MRP. See Monitoring Specification G.24 and G.28.a.1).
  - c. Any constituent that is a potential breakdown product of a corrective action monitoring parameter qualified under a or b above.
13. Prior to termination of corrective action measures required under Section 20430(c), the discharger shall demonstrate, pursuant to Section 20430(f), that the constituents of the release have been reduced to levels below CLs 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 CL for at least **four** years, beginning immediately after the suspension of active corrective action measures; and
  - 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 semiannual sampling events per year per monitoring point.
  - 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 CLs 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.

In the event that semiannual groundwater monitoring data for the site shows that active corrective action measures will not likely be necessary to successfully complete the corrective action proof period (e.g., passive measures sufficient or release constituents attenuating naturally), the foregoing requirement for suspension of such active corrective action measures shall be inapplicable. In such case, the above notification and approval requirements shall also be considered waived by the Board and the proof period commencement date applied retroactively (e.g., to beginning of first consecutive monitoring period in which VOCs were reduced to non-detect levels in groundwater). See Finding 38 and Discharge Specification B.6.c.

#### Constituents of Concern (COCs)

14. The Discharger shall implement a COC monitoring program at the site, including required background monitoring, consistent with applicable provisions of Section 20415, 20420(g), and 20425(e)(4). The goals of the COC monitoring program shall be as follows:
  - a. Scan for COCs potentially associated with the release per Monitoring Specifications G.24 and G.28.a.2).
  - b. Detect COCs associated with the release per Monitoring Specifications G.24 and G.28.a.1).
  - c. Qualify Detection and corrective action monitoring parameters.
  - d. Update the COC monitoring parameter list.
15. The COC monitoring parameter list for a given water-bearing media shall consist of all COCs under the WQPS not included in detection and corrective action monitoring above. See MRP Table J.1.C.c.

#### Updating Monitoring Lists

16. Upon confirmation (i.e., qualification) of a new detection or corrective action monitoring parameter, the Discharger shall, in consultation with Central Valley Water Board staff, submit a proposal for a revised MRP to update the monitoring lists for each water bearing media under this Order. The following changes to the MRP shall be considered in such proposals:
  - a. Constituents Associated With Release – remove from respective detection and COC monitoring parameter lists (i.e., MRP Table J.1.C.a) and MRP Table J.1.C.c), as applicable, and add to corrective action monitoring parameter list (MRP Table J.1.C.b). Such constituents shall include:
    - 1) Exceedances confirmed by data analysis under G.24 and G.28.a.1); and
    - 2) Constituents closely related to corrective action monitoring parameters

(i.e., breakdown/daughter products) per G.15.c.

- b. Constituents Potentially Associated With Release – Remove from COC monitoring parameter list (MRP Table J.1.C.c) and add to detection monitoring parameter list (MRP Table J.1.C.a). Such constituents shall include:
- 1) Those qualified by data analysis under G.24 or G.28.a.2);
  - 2) Those detected in other media per G.10.c; and
  - 3) Those potentially associated with corrective action, including:
    - i) A constituent in same group/subgroup per G.10.a; and/or
    - ii) A parent constituent per G.10.b.

Upon issuance of a revised MRP by the Executive Officer, the Discharger shall, to the extent of any changes, initiate monitoring in accordance with the updated monitoring lists.

### **Monitoring Data Analysis Methods**

#### Background Monitoring

##### Statistical Methods

17. For monitoring parameters/COCs for which at least 10% of the data from background equal or exceed their respective MDL at a given monitoring point (hereafter referred to as “statistical” monitoring parameters/COCs), the Discharger shall use a statistical data analysis method for monitoring data analysis. Borderline statistical monitoring parameters/COCs (e.g., those for which less than 20% of the data from background samples equal or exceed their respective MDL) should be periodically rechecked to verify that they are still statistical. If such check indicates that they are no longer statistical, they shall be re-designated as nonstatistical parameters per G.21.
18. Statistical methods proposed/used for evaluation of background monitoring data shall meet or exceed all applicable prescriptive standards specified in Title 27, as follows:
- a. Prescriptive Methods -- as listed in Section 20415(e)(8) (e.g., Tolerance Interval, Prediction Limits, Control Chart);
  - b. As approved by the Executive Officer under Section 20415(e)(7)(B) or as an engineered alternative under 20080(b); and/or
  - c. As authorized under the WDRs or MRP as a more stringent method per 20080(a)(1). Example: Gamma 95% UPL Method (see Finding 0).

The Discharger shall not use more than one of the above data analysis methods for a given statistical monitoring parameter/COC.

19. Any PQL validated pursuant to 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 for routine

laboratory operating conditions that are available to the facility. Any Section 20415(e)(7) technical report submitted by the Discharger shall consider the PQLs listed in Appendix IX to Chapter 14 of Division 4.5 of Title 22, California Code of Regulations, for guidance when specifying limits of precision and accuracy.

20. The statistical method shall account for data below the PQL with one or more statistical procedures that are protective of human health and the environment. For any given constituent monitored at a background or down gradient monitoring point, an indication that falls between the MDL and the PQL for that constituent (i.e., trace detection) shall be identified and used in appropriate statistical or nonstatistical 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".

#### Nonstatistical Methods

21. For monitoring parameters/COCs for which less than 10% of the data from background samples equal or exceed their respective MDL (hereafter referred to as "nonstatistical" monitoring parameters/COCs, including inorganic constituents not generally detected in background, VOCs, and other organic compounds), the Discharger shall use a nonstatistical data analysis method for monitoring. Borderline nonstatistical monitoring parameters/COCs (e.g., those for which almost 10% of the data from background samples equal or exceed their respective MDL) should be periodically rechecked to verify that they are still nonstatistical. If such check indicates that they are no longer nonstatistical, they shall be re-designated as statistical parameters per Monitoring Specification G.

#### Detection and COC Monitoring

##### Statistical Methods

22. Proposed statistical methods proposed/used for data analysis shall meet or exceed all applicable performance standards specified in Title 27, as follows:
  - a. Initial Testing -- Section 20415(e)(9) (e.g., fit and performance,  $\alpha$  level, confidence level)
  - b. Verification Testing – Same as above plus Section 20415(e)(8)(E) (e.g., discrete retest rule).

See also Monitoring Specifications G.19 and G.20.

23. Statistical methods proposed/used for evaluation of detection and COC monitoring data shall meet or exceed all applicable prescriptive standards specified in Title 27, as follows:
  - a. Initial Testing – Same as for background monitoring. See Monitoring Specification G.18.

b. Verification Testing -- Same as initial testing plus method shall conform to the requirements of Section 20420(j) (e.g., protocols for discrete retest rule).

- 1) A single composite retest (pass 1-of-2); or
- 2) At least two discrete retests (e.g., pass 2-of-3, pass 3-of-4)

For any given retest sample, the Discharger shall include in the retest analysis only the laboratory analytical results for those analytes detected in the original sample.

24. The Discharger shall determine, for a given detection or COC monitoring parameter, as applicable, whether there is measurably significant evidence (MS/E) of a release<sup>18</sup> or potential release<sup>19</sup> from the unit at a given (detection or COC) monitoring point. Such determination shall be made using the appropriate data analysis method(s) under Monitoring Specification G.22 within a reasonable amount of time after initial sampling. The criteria and confidence levels for making these determinations shall be as follows, for a given data analysis method:

<u>Determination:</u>	<u>Potential Release</u>	<u>Release</u>
Null Hypothesis	<i>No MS/E</i>	
Trigger <sup>1</sup>	$75\% \leq C_{PR}^2 < C_R^3$	$C_L^4 \leq C_R^4 \leq C_U^4$
If Triggered:		
Initial Testing	<i>Preliminary Indication of MS/E</i>	
Verification Testing (optional): <sup>5</sup>	<i>Confirmation of MS/E</i>	

1. Confidence level required to reject null hypothesis (e.g., trigger release).
2.  $C_{PR}$  -- confidence level triggering MS/E of potential release.
3.  $C_R$  -- confidence level triggering MS/E of release.
4.  $C_L, C_U$  -- Minimum and maximum confidence levels specified in Title 27 for given data analysis method.
5. MS/E deemed confirmed if optional retest not conducted.

#### Nonstatistical Methods

25. Proposed nonstatistical methods for data analysis shall consist of one or more of the following, as appropriate:

a. California Nonstatistical Data Analysis Method (pass 2-in-3)

Nonstatistical Trigger -- For each monitoring point, identify each analyte (i.e., monitoring parameter or COC) in the current sample that exceeds its respective PQL and/or MDL.

- 1) Release -- MS/E shall be tentatively indicated, and upon retesting confirmed, if one or both of the following criteria are met in each test:

<sup>18</sup>. Any detection or COC monitoring parameter detected and confirmed above CL.

<sup>19</sup>. Any detection or COC monitoring parameter detected above mean background concentration, but below CL, within specified confidence interval.

- i. The data contain two or more analytes that equal or exceed their respective MDLs; and/or
  - ii. The data contain one analyte that equals or exceeds its PQL.
- 2) Potential Release – MS/E shall be tentatively indicated, if either of the following criteria is met during testing:
- i. The data contains only one analyte and that analyte at a trace concentration; or
  - ii. Retesting under G.28.a.1) fails to confirm MS/E of a release.

The method may be summarized as follows:

<u>Determination:</u>	<u>Potential Release</u>	<u>Release</u>
Null Hypothesis	<i>No MS/E</i>	
Initial Testing (Required):		
Trigger 1	1 COC $\geq$ MDL	2 COCs $\geq$ MDL and/or 1 COC $\geq$ PQL
If Triggered:	<i>Preliminary Indication of MS/E</i>	
Verification Testing (Optional) <sup>1</sup>		
Trigger 2	Same as Trigger 1	
If Triggered:	<i>Confirmation of MS/E<sup>1</sup></i>	

1. MS/E deemed confirmed if optional retest not conducted.

- b. Other Methods -- Any nonstatistical method that satisfies Title 27 performance standards (i.e., Monitoring Specification above) and meets the goals of the monitoring program, as approved by the Executive Officer. See Sections 20415(e)(7) and 20415(e)(8).

Corrective Action Monitoring

26. Corrective action monitoring shall include one or more of the following data analysis methods, as appropriate:
- a. Statistical and nonstatistical data analysis methods used to quantify release (see Monitoring Specifications G.22 through G.25).
    - 1) Compare current corrective action monitoring data to current background data
      - i. Use single constituent criteria under California Nonstatistical Data Analysis Method for nonstatistical data. See G.25.a.1)ii.
      - ii. Compare historical corrective action monitoring data to current background data (e.g., calculate running means).
  - b. Evaluation of trends associated with release
    - 1) Statistical methods (e.g., least squares fit, Sens slope)
    - 2) Graphical methods (i.e., time series plots, comparison of concentration contour maps).

c. Water quality chemistry analysis

**Sample Collection and Laboratory Analysis**

27. The Discharger shall develop, implement, and maintain a Sample Collection and Analysis Plan for monitoring that includes the following elements:
- Sample collection procedures describing purging techniques, sampling equipment, and decontamination of sampling equipment;
  - Sample preservation information and shipment procedures;
  - Sample analytical methods and procedures; Sample quality assurance/quality control (QA/QC) procedures; and
  - Chain of custody control.

The Sample Collection and Analysis Plan shall also be consistent with Monitoring Specifications G.28 through G.38 below. A copy of the plan shall be submitted annually in accordance with MRP Sections ~~1.2.e.i-2.e.i~~ and ~~1.5i-5~~.

28. Sample collection and analysis shall be conducted consistent with the following:
- The performance standards specified in Section 20415(e)(12); and
  - Sections X (Monitoring Specifications) and XI (Response to Release), SPRR.
29. 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, and shall be taken in a manner that ensures sample independence to the greatest extent feasible.
30. 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
- Methods for the Analysis of Organics in Water and Wastewater (USEPA 600 Series),
  - Test Methods for Evaluating Solid Waste (SW-846, latest edition), and;
  - Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020), and in accordance with the approved Sample Collection and Analysis Plan.
31. Specific methods of collection and analysis must be identified. If methods other than USEPA-approved methods or Standard Methods are used, the exact methodology shall be submitted for review and approval by the Executive Officer prior to use.
32. 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 method detection limit (MDL) shall be selected from among those methods which would provide valid results in light of any matrix effects or interferences.

33. "Trace" results - results falling between the MDL and the practical quantitation limit (PQL) - shall be reported as such, and shall be accompanied by both the estimated MDL and PQL values for that analytical run.
34. 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.
35. 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 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.
36. Unknown chromatographic peaks shall be reported, along with an estimate of the concentration of the unknown analyte. When unknown peaks are encountered, second column or second method confirmation procedures shall be performed to attempt to identify and more accurately quantify the unknown analyte.
37. 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 qualifications of the person(s) performing the analyses. Sample results shall be reported unadjusted for blank results or spike recoveries. In cases where contaminants are detected in QA/QC samples (e.g., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged.
38. 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, non-routine repair, or abandonment of monitoring devices. The

Discharger shall also, upon request of Central Valley Water Board staff, be prepared to provide a sampling schedule at least 48 hours prior to initiation of each detection, evaluation, or corrective action monitoring event conducted pursuant to MRP No. R5-2012-0026.

## H. REPORTING REQUIREMENTS

1. The Discharger shall comply with the reporting requirements specified in this Order, MRP No. R5-2012-0026 and the SPRR.
2. 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 Regional 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.
3. The Discharger shall respond as follows in response to detecting evidence of a release:<sup>20</sup>
  - a. Preliminary Indication
    - 1) Immediately notify Central Valley Water Board staff of such indication by phone or e-mail; and,
    - 2) Within 30 days, or as otherwise approved under the analysis method (i.e., up to 90 days), conduct verification (retest) sampling.<sup>21</sup>
  - b. Confirmation
    - 1) Immediately notify the Central Valley Water Board about the constituent verified to be present at the monitoring point, and follow up with written notification submitted by certified mail within seven days of validation; and
    - 2) Proceed in accordance with Monitoring Specification H.5 below.
    - 3) Coordinate with Board Staff to update the affected monitoring lists (i.e., monitoring points, monitoring parameters). See Monitoring Specification G.16.
4. Notwithstanding the results of preliminary and/or confirmation testing above, the

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<sup>20</sup>. Exceedances that the Discharger demonstrates are the result of (1) sample corruption; (2) laboratory interferences; (3) error; (4) natural variation in the water quality; (5) statistical evaluation, or (6) other cause not associated with a release from the unit shall neither provide a preliminary indication of a release nor, in the case of verification testing, confirm a release. Retesting may be necessary, however, to make this demonstration or to obtain valid monitoring data. See Section 20420(k)(7).

<sup>21</sup>. Exceedances for any constituent for which the Discharger fails to conduct a retest will be considered confirmed without retest unless and until the Discharger demonstrates its absence through subsequent monitoring.

Discharger shall consider whether there is physically significant evidence of a release from the Unit per Title 27, Section 20385(a)(3), which states:

*Significant physical evidence of a release includes unexplained volumetric changes in surface impoundments, unexplained stress in biological communities, unexplained changes in soil characteristics, visible signs of leachate migration, and unexplained water table mounding beneath or adjacent to the Unit and any other change to the environment that could reasonably be expected to be the result of a release from the Unit. . .*

5. If the Discharger determines that there is either materially or physically significant evidence of a release from the Unit at any monitoring point, the Discharger shall immediately implement the requirements for Response to a Release contained in the SPRR.
6. The Discharger shall notify the Regional Water Board in writing of any proposed change in ownership or responsibility for construction or operation of the landfill. To assume ownership or operation under this Order, the succeeding owner or operator must apply in writing to the Regional 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 Regional Water Board, and a statement. The statement shall comply with the signatory requirements contained in Reporting Requirements H.8 and H.9 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer of this Order shall be approved or disapproved by the Regional Water Board.
7. The discharger shall mail a copy of each monitoring report and any other reports required by this Order to:  

Title 27 Compliance Unit  
California Regional Water Quality Control Board  
Central Valley Region  
11020 Sun Center Drive, Suite 200  
Rancho Cordova, CA 95670

(or the current address if the office relocates)
8. 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;

- i. The authorization is made in writing by a person described in a, b, or c of this provision;
  - ii. 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
  - iii. The written authorization is submitted to the Regional Water Board.
9. Any person signing a document under Reporting Requirement H.8 above 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.”*
10. By **31 May 2012**, the Discharger shall establish and maintain an account with the SWRCB's GeoTracker geographic information system data base, including a full declaration of the names and locations of all waste management units and Field Points (the GeoTracker name for monitoring points), plus a declaration of all COCs, and shall begin uploading word-searchable pdf copies of all monitoring program reports and associated laboratory sheets (the latter in GeoTracker's proprietary format) required under these WDRs. The Discharger shall also upload any additional monitoring program reports or report features required by the Executive Officer beginning with the Reporting Period following notification to submit such additional reports/report-features.
11. The Discharger or persons employed by the Discharger shall comply with all notice and reporting requirements of the State Department of Water Resources with regard to construction, alteration, destruction, or abandonment of all monitoring wells used for compliance with this Order or with MRP No. R5-2012-0026, as required by California Water Code sections 13750.5 through 13755 of the California Water Code.

## **I. PROVISIONS**

### *General*

1. The Discharger shall maintain a copy of this Order at the facility and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.
2. The Discharger shall comply with all applicable provisions of Title 27 and 40 Code of Federal Regulations Part 258 (Subtitle D) that are not specifically

referred to in this Order.

3. The Discharger shall comply with the MRP No. R5-2012-0026, which is attached to and made part of this order. A violation of the MRP is a violation of these waste discharge requirements.
4. The Discharger shall comply with the Standard Provisions and Reporting Requirements (SPRR), dated April 2000, which are hereby incorporated into this Order. The SPRR contain important provisions and requirements with which the Discharger must comply. A violation of any of the SPRR is a violation of these waste discharge requirements.
5. 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.
6. 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 postclosure maintenance period of the Unit(s) and during subsequent use of the property for other purposes.

#### *Cost Estimates and Financial Assurances*

7. By **1 May 2012**, the Discharger shall, pursuant to water quality Section 20380(b) and solid waste Section 22101(a), submit a report containing updated cost estimates for initiating and completing corrective action (C/A) for all known or reasonably foreseeable releases from the Unit. At a minimum, the report shall include the following information:
  - a. Known Release
    - 1) Summary as to the nature and extent, as known;
    - 2) Summary of measures undertaken or necessary to address release (e.g., investigation, cleanup, repairs, source mitigation);
    - 3) Status of all measures (i.e., completed, in progress, yet to be implemented); and
    - 4) Itemized and total cost estimates for completing corrective action
  - b. Reasonably Foreseeable Release
    - 1) Identification of foreseeable release scenarios for each unit;
    - 2) Selection of reasonably foreseeable release(s) (e.g., those scenarios with highest probability of occurrence);
    - 3) Summary of measures necessary to address release(s) (e.g., investigation, cleanup, repairs, source mitigation);

- 4) Itemized and total cost estimates for implementing and completing corrective action (costs of each scenario may be weighted by probability of occurrence).

Copies of the report shall also be provided to the LEA and CalRecycle.

8. By **1 December 2012**, the Discharger shall obtain and maintain assurances of financial responsibility for corrective action (Section 22220 et seq.) in at least the amount of the cost estimates submitted under Provision I.7 above. The financial assurances mechanism for each shall be an irrevocable fund or other acceptable mechanism under CalRecycle-promulgated sections of Chapter 6, Title 27 with the Central Valley Water Board designated as a beneficiary. See also Section IV.a, *Financial Assurance Provisions*, SPRR.
9. By **1 May 2013**, the Discharger shall submit for approval an updated preliminary closure and postclosure maintenance plan (PC/PCMP) to reflect operations and requirements under these WDRs, including MRP No. R5-2012-0026. The PC/PCMP shall meet the requirements of Section 21769(b) applicable to an active landfill and shall reflect current or anticipated expansion plans (lateral and/or vertical) consistent with the requirements of this Order.<sup>22</sup> The updated PC/PCMP shall include updated third party cost estimates for the following items, as necessary:
  - a. Landfill closure (e.g., grading, installation of cover)
  - b. Postclosure Maintenance (e.g., cover repairs, facility maintenance, groundwater monitoring)
    - 1) Annual estimate
    - 2) 30-year estimate

Copies of the updated PC/PCMP shall also be provided to the LEA and CalRecycle.

10. By **1 September 2013**, the Discharger shall obtain and maintain assurances of financial responsibility for closure (Section 22207) and post-closure maintenance (Section 22212), including monitoring, in at least the amount of the cost estimates submitted in the updated PC/PCMP under Provision I.9 above. The financial assurances mechanism for each shall be an irrevocable fund or other acceptable mechanism under CalRecycle-promulgated sections of Chapter 6, Title 27 with the Central Valley Water Board designated as a beneficiary. See also Section IV.b, *Financial Assurance Provisions*, SPRR.
11. By **31 January 2013** and annually thereafter, the Discharger shall submit for the Executive Officer's review and approval a report as to the status of required financial assurances. The report shall identify the following:

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22. Any PC/PCMP reflecting plans for landfill expansion beyond the scope authorized under these WDRs shall be submitted as part of a revised JTD per WDR Discharge Specification B.4.

- a. Required financial assurances for the facility, including type and current amounts, as escalated;
- b. Financial assurance instrument(s) or mechanism(s) and corresponding amounts provided to satisfy the required financial assurances;
- c. Validity and ongoing viability of the above financial assurance mechanism(s), including any needed changes. This demonstration shall include evidence that the required financial assurance mechanisms satisfy the CalRecycle-promulgated sections of Title 27, Chapter 6.<sup>23</sup>

12. Consistent with required facility monitoring under MRP Section CC, the Discharger shall investigate and, by **31 July 2012**, submit a report describing the condition and operational status of the following monitoring and control facilities at the site, as applicable:

- a. Landfill cover
- b. Precipitation and drainage controls
- c. Diversionary dam and pipeline
- d. LFG controls and monitoring points
- e. Groundwater monitoring wells

For each monitoring and/or control facility above, the status report shall address/include the following:

- Intended purpose or function of facility or device;
- Design and mode of operation;
- Operational history, including current condition and status;
- Effectiveness in achieving purpose or function (i.e., as designed and in current condition);
- Whether facility meets requirements of WDRs;
- Proposed measures (i.e., repairs, replacement, and/or improvement) to restore/improve facility effectiveness and/or bring facility into WDR and/or MRP compliance; and
- A work plan and schedule for implementing such proposed measures.

13. By **31 January 2013**, the Discharger shall submit, for Executive Officer approval pursuant to Section 20415(e)(7)(B), a technical report proposing statistical and nonstatistical data analysis methods for background, detection, and corrective action monitoring (including associated evaluation monitoring) consistent with Title 27 requirements and the monitoring specifications of this Order. The report may be included in the 2012 Annual Monitoring Report due by the same date under MRP No. R5-2012-0026.

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23. The most recent financial assurances acceptance letter from the CalRecycle's Financial Assurance Division may suffice for this purpose.

14. By **31 May 2012**, the Discharger shall submit a report for Executive Officer concurrence that, at a minimum, includes the following::
- a. A plan for evaluation of possible source(s) of historical groundwater impacts at the site (e.g., leachate, LFG). At a minimum, this evaluation shall address the following:
    - 1) The adequacy of existing landfill cover (operational and interim) in reducing/preventing ponding and infiltration;
    - 2) The effectiveness of existing landfill grading and drainage facilities in promoting runoff;
    - 3) Whether any VOCs have been detected in gas monitoring wells at the site;
    - 4) The need for any operational improvements or passive corrective action measures to address leachate and/or landfill gas as a possible source of historical and/or future VOC impacts at the site; and
  - b. An implementation schedule for any operational improvements or passive corrective action measures that may be necessary to reduce or control leachate and landfill gas, as feasible.

*Other Provisions*

15. 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 the Order.
16. 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.
17. The Regional Water Board will review this Order periodically and will revise these requirements when necessary.

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 30 March 2012.

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PAMELA C. CREEDON, Executive Officer

Attachments  
JDM

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2012-0026  
CONSTRUCTION, OPERATION, AND CORRECTIVE ACTION  
SIERRA COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS  
LOYALTON LANDFILL  
CLASS III LANDFILL  
SIERRA COUNTY

This monitoring and reporting program (MRP) is issued pursuant to California Water Code section 13267 and incorporates requirements for landfill maintenance and monitoring contained in California Code of Regulations (CCR), title 27, division 2 (Title 27 regulations); Waste Discharge Requirements (WDRs) Order No. R5-2012-0026; and the April 2000 Standard Provisions and Reporting Requirements (SPRR). Compliance with this MRP is ordered by the WDRs. The Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Executive Officer. Regulatory sections quoted in this MRP refer to CCR, Title 27 unless otherwise noted.

<b>MONITORING SUMMARY TABLE</b>		
<u>Section</u>	<u>Requirement</u>	<u>Frequency</u>
A	Solid Waste Monitoring	Quarterly
B	Standard Observations	Quarterly
C	Facility Monitoring:	
	1. Maintenance Inspections	Quarterly
	2. Storm Response	Within 7 Days After Significant Storm Event
	3. Site Winterization	Annually
D	Leachate Monitoring	Semiannually
E	Gas Monitoring	Semiannually
F	Unsaturated Zone Monitoring <sup>1</sup>	Semiannually
G	Groundwater Monitoring Programs	
	1. Field Parameter	Semiannually
	2. Background	Same As Compliance <sup>2</sup>
	3. Compliance	
	a. Detection	Semiannually
	b. Corrective Action	Semiannually
	c. Constituents of Concern (COCs)	Every 5 years
H	Surface Water Monitoring:	
	1. Onsite stream	Semiannually
	2. Storm Water	Semiannually

I	Reporting	
	1. Semiannual Report	Semiannually
	2. Annual Monitoring Summary	Annually
	3. COC Monitoring Report	Every five-years
	4. Other Reports	See Section I.4
J	Attachment Tables	
	1. Groundwater Monitoring Schedules	See Table J.1
	2. COC List	See Table J.2

1. Unsaturated zone monitoring required only for lined lateral expansion of existing unit per WDR Discharge Specifications B.2.b and B.3.a.
2. More frequent monitoring may be required to establish CLs for inorganic COCs or in response to a release. See Groundwater Monitoring G.3.a.iv.

**A. SOLID WASTE MONITORING**

The Discharger shall monitor and report all wastes discharged to each module in the landfill as follows:

1. Monitoring Points – Active areas of Landfill 1
2. Monitoring List and Schedule

**Table A.2**

<u>Parameter</u>	<u>Units or Description</u>	<u>Frequency</u>
Quantity of waste discharged	Cubic yards, tons	Quarterly
Types of waste discharged	e.g., MSW, C & D <sup>1</sup>	Quarterly
Location and elevation of waste discharged	Identify area of module (i.e., SW portion of NFA); MSL	Quarterly
Remaining landfill capacity	%	Semiannually
Size of landfill footprint	Acres	Annually

1. Include brief description of wastes in each of these categories (e.g., refuse, glass, wood).

See Section I.1.d for reporting. See also General Provision III.C, SPRR.

**B. STANDARD OBSERVATIONS**

Standard Observations of the facility shall be performed as follows:

1. Monitoring Points -- Landfill unit, unit perimeter, and adjacent intermittent stream
2. Monitoring List
  - a. For the Unit:

- i. Evidence of ponded water at any point on the facility (show affected area on map);
    - ii. Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
    - iii. Evidence of erosion and/or of day-lighted refuse.
  - b. Along the perimeter of the Unit:
    - i. Evidence of liquid leaving or entering the Unit, estimated size of affected area, and flow rate (show affected area on map);
    - ii. Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
    - iii. Evidence of erosion and/or of day-lighted refuse.
  - c. For receiving waters:
    - i. Floating and suspended materials of waste origin - presence or absence, source, and size of affected area;
    - ii. Discoloration and turbidity - description of color, source, and size of affected area;
    - iii. Evidence of odors - presence or absence, characterization, source, and distance of travel from source;
    - iv. Evidence of water uses - presence of water-associated wildlife;
    - v. Flow rate; and
    - vi. Weather conditions - wind direction and estimated velocity, total precipitation during recent days and on the day of observation.
3. Monitoring Schedule – Quarterly
4. If Leachate Detected –
  - a. Any landfill leachate seeps (or other significant physical evidence of a release) detected during these inspections (or at any other time) shall be immediately reported to Central Valley Water Board staff with written follow-up within 7 days.<sup>1</sup>
  - b. If leachate or other waste enters the facility drainage system, representative samples of the discharge shall be collected and analyzed for all Table J.2 COCs.
  - c. If a discharge to surface water occurs, the Discharger shall follow the response to release provisions of the SPRR.<sup>1</sup>

See Sections I.1.d and I.1.h.i herein for reporting requirements.

### **C. FACILITY MONITORING**

The Discharger shall conduct facility monitoring, including (but not necessarily limited to) visual monitoring, to ensure that all significant landfill facilities are functioning

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<sup>1</sup>. See Section XI, *RESPONSE TO RELEASE*, SPRR.

properly and are in adequate maintenance and repair. Any damage to the landfill facilities observed during these inspections shall be flagged and repaired as specified below.

1. Monitoring Points – All landfill monitoring and control facilities, including, but not necessarily limited to, landfill cover; precipitation and drainage controls (including diversionary dam and pipeline); leachate and LFG controls (as applicable); lysimeters; monitoring wells; and access roads.
2. Monitoring List and Schedule

**Table B.2**

<u>Item</u>	<u>Inspection Frequency</u>	<u>Complete Repairs<sup>1</sup></u>
1. Regular Maintenance	Quarterly	Within 30 days
2. Storm Response	Within one week of significant storm event <sup>2</sup>	Within two weeks of storm event
3. Site Winterization	By September 30 of each year	By October 31 of each year

1. If necessary repairs cannot be completed within specified time frame, the Discharger shall, within seven days, notify the Central Valley Water Board and provide a schedule for completing them.
2. A "significant" storm event shall be one that produces 2.0 inches or more of precipitation within a 24-hour period, as measured at the Roseville Fire Station.

See Sections I.1.e.2) and I.1.h.i herein for facility reporting requirements.

**D. LEACHATE MONITORING**

Leachate monitoring shall be conducted at all modules constructed (or retrofitted) with LCRS sumps per Construction Specification C.3.

1. Monitoring Points
  - a. Existing – None (no portion of unit currently equipped with LCRS)
  - b. Future – All future LCRS sumps installed at unit
2. Monitoring List – Volume collected (gallons); All Table J.1 monitoring parameters, except as follows:
  - a. Elevation -- Monitor leachate elevation from reference point (or depth in sump) based on measurement or observation.
  - b. Redox potential not required
3. Monitoring Schedule:

**Table D.3**

<u>Parameter<sup>1</sup></u>	<u>Units</u>	<u>Frequency</u>	<u>Data Analysis</u>
Field Parameters	See Table J.1	Semiannually	n/a
General Parameters	See Table J.2	Semiannually	n/a
General Minerals	mg/L	Annually	n/a

Dissolved Metals	µg/L	Annually	n/a
VOCs	µg/L	Semiannually	n/a
Other Organic COCs	µg/L	Every 2½ years	n/a

1. See Tables J.1 and J.2 for full list of constituents and EPA test methods.

Visual Inspections shall be conducted at least quarterly for the presence or absence of leachate. Any liquid detected in the sump shall be removed after completion of sampling.

- If COC Monitoring Parameter Detected -- If a constituent is detected in leachate that is a COC monitoring parameter under either the unsaturated zone or groundwater monitoring programs, that constituent shall be monitored at least **semiannually** under this section and the monitoring lists for those programs shall be updated accordingly. See WDR Monitoring Specification G.16.b.

### E. GAS MONITORING

The Discharger shall monitor LFG and soil gas to assess whether these media contain constituents that could impact groundwater at the site and the need for LFG controls to mitigate any such source. Gas monitoring shall be conducted as follows:

#### 1. Monitoring Points

<u>Well/Probe<sup>1</sup></u>	<u>Location</u>	<u>Depth (ft)</u>
<i>Northern Fill Area:</i>		
GP-1	Western perimeter	2 - 14
GP-2	NE perimeter	2 - 14
GP-3	Eastern perimeter	2 - 14
GP-5	Central area	In waste
MW-4	Eastern perimeter	30 – 50
SGVP-1	NW perimeter	10
SGVP-2	North-central perimeter	10
SGVP-3	SE perimeter	10
<i>Southern Fill Area:<sup>2</sup></i>		
n/a	n/a	n/a

1. Monitoring points limited to wells/probes along landfill unit perimeter.

2. Module not currently developed except for small area of historical fill noted in WDR findings.

Gas monitoring shall also be conducted at any future (or replacement) gas monitoring wells or probes installed in (or through) landfill waste or within 20 feet of the landfill unit perimeter. See Attachment C for current gas monitoring locations.

2. Monitoring parameters and Schedule

**Table E.2**

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>	<u>Method</u>
Gas Pressure	psig	Semiannually	Meter
Ambient Temperature	°C, °F	Semiannually	Meter
Methane	%	Semiannually	Meter
Carbon Dioxide	%	Semiannually	Meter
VOCs <sup>1</sup>	ppbv	Semiannually	EPA Method TO-15 or 8260B

1. VOC sampling not required at any landfill perimeter gas well or probe previously sampled for VOCs under this Order in which the current methane concentration, as measured by field meter, is less than 5% by volume.

Field meters shall be calibrated for each parameter before use. Field and calibration logs for each monitoring event shall be included in each monitoring report. See Section I.1.f for reporting requirements.

If COC Monitoring Parameter Detected -- If a constituent (i.e., VOC) is detected in LFG and/or soil gas that is a COC monitoring parameter under either the unsaturated zone or groundwater monitoring programs, the monitoring lists for those programs shall be updated accordingly. See WDR Monitoring Specification G.16.b.

**F. UNSATURATED ZONE MONITORING (20415(d))**

For any lined lateral expansion of the landfill proposed and approved under these WDRs in accordance with WDR Construction Specifications C.7 and C.8, the Discharger shall implement a soil pore water monitoring program. The program shall include the following elements:

1. Monitoring Points

A sufficient number of suction lysimeters shall be established and maintained at appropriate locations and depths to achieve Title 27 monitoring goals for each program (i.e., field parameter, background, and compliance). Moisture block sensors 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 lysimeter where the moisture block resistivity reading indicates there is pore fluid.

2. Monitoring List -- The unsaturated zone monitoring list shall include the following:

- a. Volume of liquid recovered (in cubic inches or other appropriate units);
- b. All Table J.1 monitoring parameters, except as follows:
  - i. Elevation -- Report lysimeter elevation or depth below ground surface
  - ii. Redox potential not required

3. Monitoring Schedule -- Same as for groundwater compliance monitoring, except as follows:

- a. All regular (i.e., semiannual, annual, and 5-year) monitoring events shall be conducted during the wet season.
- b. Quarterly monitoring shall be conducted for all inorganic constituents (i.e., general parameters, general minerals, and dissolved metals) until CLs are developed for those constituents.

See Table G.3.b.iii for detection/corrective action monitoring schedule and Table G.3.c.iii for COC monitoring schedule.

#### 4. If Exceedance Detected

- a. If tentatively indicated, the Discharger shall proceed with applicable notification and retest procedures per WDR Reporting Requirement H.3.a, except as follows:
  - i. Retesting shall be conducted as soon as feasible if a sufficient liquid sample cannot be collected from the lysimeter within 30-days; and
  - ii. Only one sample need be collected for the retest.
- b. If confirmed, the Discharger shall:
  - i. Proceed with notification and response to release procedures in WDR Reporting Requirement H.3.b.
  - ii. Update the unsaturated zone monitoring list, as warranted, per WDR Monitoring Specification G.16.a.; and
  - iii. If a groundwater COC monitoring parameter, update the groundwater monitoring list per WDR Monitoring Specification G.16.b.

### **G. GROUNDWATER MONITORING**

The Discharger shall implement concurrent field parameter, background, and compliance (including detection; corrective action; and COC) monitoring programs under this Order as specified below.

#### 1. Field Parameter Monitoring (Section 20415(e))

Field parameter monitoring, including, but not limited to, groundwater elevation monitoring, shall be conducted consistent with WDR Monitoring Specification G.5<sup>2</sup>, as follows:

- a. Monitoring Point(s) – All wells (presently MWs-2, 3, 5, 6, 7, and MY). See Attachment B.
- b. Monitoring List – All Table J.1.A field parameters.
- c. Monitoring Schedule -- Semiannually

See Section I.1.h.2) for field parameter reporting.

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2. Groundwater elevation measurements shall be taken within a period of time short enough to avoid temporal variations in groundwater flow to enable accurate determination of gradient and direction. Groundwater elevations may be taken prior to purging the well and sampling.

2. Background Monitoring (Section 20415(b)(1)(A))

The Discharger shall develop and implement a background monitoring program for groundwater consistent with WDR Monitoring Specifications G.6 through G.8.

a. Monitoring Point(s)

A sufficient number of background monitoring wells shall be installed and operated at appropriate locations and depths to yield samples that represent the quality of groundwater from the uppermost aquifer not affected by a release from the unit. The background monitoring points shall be as follows:

- i. Upgradient well MW-6 and
- ii. As otherwise proposed and approved consistent with Title 27 requirements.
- iii. Monitoring List – As specified in Table J.1.B or as updated per WDR Monitoring Specification G.16.

b. Monitoring Schedule -- As specified in Tables G.3.b.iii and J.1.B, except as follows:

- i. Monitoring shall be conducted at least **semiannually** for inorganic COCs for which CLs have not yet been developed due to lack of historical data. Once such data has been collected to develop CLs under the appropriate data analysis method (e.g., tolerance limits), background monitoring may be resumed in accordance with Table J.1.B. See Section 20415(e)(6) through 20415(e)(12).

3. Compliance Monitoring

a. Detection Monitoring (Section 20420)

The Discharger shall establish and implement a groundwater detection monitoring program that complies with all applicable monitoring and reporting specifications of the WDRs, including (but not necessarily limited to) WDR Monitoring Specifications G.9, G.10, G.16, G.22 through G.25; and WDR Reporting Specifications H.3 through H.6.

A sufficient number of detection monitoring wells shall be installed and operated at appropriate locations and depths to yield groundwater samples that represent the quality of ground water passing the Point of Compliance and to allow for the earliest detection of a release from the unit.

- i. Monitoring Points – All background and Point of Compliance wells (presently MWs-2, 5, 6, and 7). See Attachment B.
- ii. Monitoring List – As specified in Table J.1.C.b (as updated per WDR Monitoring Specification G.16).
- iii. Monitoring Schedule -- As specified in Table J.1.C.a.
- iv. If Release Detected -- Provide notice per Reporting Specification H.3.b.1); follow response to release procedures per Reporting Specification H.5; and update compliance monitoring lists per Monitoring Specification G.16.a.

- v. If Potential Release Detected -- Update compliance monitoring lists per Monitoring Specification G.16.b.1).

b. Corrective Action Monitoring (Section 20430)

The Discharger shall establish and implement a groundwater corrective action monitoring Program that complies with WDR Monitoring Specifications G.11 through G.13, as applicable. The corrective action monitoring system shall be designed and installed so as to monitor the nature and extent of the release and the progress of corrective action measures in returning groundwater to compliance with the WQPS. All samples shall be collected and analyzed in accordance with WDR Monitoring Specifications G.27 through G.38.

- i. Monitoring Points – All background and compliance wells (presently MWs-2, 3, 5, 6, 7, and MY). See Section I.4.b.iii and Attachment B.
- ii. Monitoring List – As specified in Table J.1.C.b, as updated per WDR Monitoring Specification G.16.a.
- iii. Monitoring Schedule:

**Table G.3.b.iii**

<u>Parameter</u> <sup>1</sup>	<u>Units</u>	<u>Frequency</u> <sup>2</sup>	<u>Data Analysis</u>
General Parameters	%	Semiannually	---
General Minerals	mg/L	Semiannually	Statistical
Dissolved Metals	µg/L	Annually	Statistical/Nonstatistical
VOCs	µg/L	Semiannually	Nonstatistical

1. See Tables J.1 and J.2 for full list of constituents and EPA test methods.

2. More frequent monitoring may be required to establish CLs for inorganic COCs or in response to a release. See Sections G.2.b.i and G.3.a.iv.

Consistent with WDR Discharge Specification B.6.c, the corrective action proof period under this Order for demonstrating the facility has re-qualified for a Subtitle D liner exemption shall be retroactively deemed to have commenced on **1 January 2009** and shall end no earlier than **31 December 2012**.

c. COC Monitoring (Sections 20420(g), 20425(e)(4))

Concurrent with the other required monitoring programs under this MRP, the Discharger shall develop and implement a groundwater COC monitoring program in accordance with WDR Monitoring Specifications G.14 and G.15.

- i. Monitoring Points -- All background and compliance wells (presently MWs-2, 3, 5, 6, 7 and MY). See Section I.4.b.iii and Attachment B.
- ii. Monitoring List – All Table J.1.C.c monitoring parameters as updated consistent with WDR Monitoring Specification G.16.
- iii. Monitoring Schedule – By **15 December 2013** and at least every five years thereafter. Additional or more frequent COC monitoring may be required to establish CLs or in response to a release. See Sections G.2.b.i and G.3.a.iv.

- iv. If Release or Potential Release Detected – See Section G.3.a.iv and G.3.a.v, respectively.

**H. SURFACE WATER MONITORING (Section 20415(c))**

The Discharger shall develop and implement background and compliance monitoring programs for surface water consistent with WDR Monitoring Specifications G.1 through G.20, as applicable to surface water monitoring.

1. Onsite Stream

a. Monitoring Points

Surface water monitoring shall be conducted at the following locations relative to the landfill and intermittent stream (See Attachment B: Site Map):

<u>Monitoring Station</u>	<u>Program</u>	<u>Location</u>
S-4	Background	Immediately upstream of borrow area outfall, downstream of diversionary dam
S-1	Background	Immediately upstream of confluence, downstream of borrow area outfall
S-2	Compliance	Immediately upstream of confluence, downstream of landfill
S-3	Compliance	Immediately downstream of confluence

b. Monitoring List – All Tables J.1.A field parameters and J.2 COCs, except as follows:

- i. Elevation -- Monitor surface water elevation (or depth from reference point) based on measurement or observation.
- ii. Redox potential not required

c. Monitoring Schedule:

**Table H.1.c**

<u>Parameter</u> <sup>1</sup>	<u>Units</u>	<u>Frequency</u> <sup>2</sup>	<u>Data Analysis</u>
Field Parameters	See Table J.1.A	Semiannually	---
General Parameters	%	Semiannually	---
General Minerals	mg/L	Semiannually	Statistical
Dissolved Metals	µg/L	Annually	Statistical/Nonstatistical
VOCs	µg/L	Annually	Nonstatistical
Other Organic COCs	See Table J.2.B	Every 5 years	Nonstatistical

1. See Tables J.1 and J.2 for full list of constituents and EPA test methods.

2. More frequent monitoring may be required to establish CLs for inorganic COCs or in response to a release.

## 2. Storm Water

Monitoring of storm water discharges from the site shall be conducted in accordance with the SWRCB General Industrial Storm Water Permit (Water Quality Order No. 97-03-DWQ), as applicable to the facility.

The results of surface water monitoring (including storm water monitoring under the General Storm Water Permit) shall be summarized in the monitoring reports submitted under this Order. If there was no water in the pond or stream during the monitoring period, or the Discharger did not obtain samples at one or more of the required monitoring points, the Discharger shall state the reasons and circumstances for not obtaining samples in the monitoring report.

## I. REPORTING

### 1. Semiannual Reports

The Discharger shall report monitoring data and information as required in this MRP and as required under WDRs Order No. R5-2012-0026 and the SPRR. Reports shall be submitted **semiannually**. Each semiannual monitoring report shall contain the following information:

#### a. Transmittal letter

- 1) Identify any violations found since the last report was submitted, and whether those violations were corrected. If no violations occurred since the last submittal, so state.
- 2) A discussion of all 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.

#### b. Table of Contents

A table of contents that, at a minimum, identifies the major sections of the report that contain the information required under this Order (e.g., chapter and page numbers).

#### c. Compliance Summary

A compliance summary that, at a minimum, contains the following information:

- 1) A summary of any WDR violations and/or exceedances that occurred during the monitoring period;
- 2) A statement verifying that the sampling procedure implemented at each monitoring point was in accordance with the approved Sample Collection and Analysis Plan; and
- 3) A statement verifying that all laboratory statements pertaining to evaluating compliance with requirements have been included in the report.

#### d. Solid Waste Monitoring

Provide required waste disposal information in narrative and/or tabular format.

- e. Standard Observations and Facility Monitoring
  - 1) A summary and certification of the completion of all Standard Observations.
  - 2) A summary of the results of facility monitoring, including any significant damage noted and/or repairs conducted. If no inspection and/or repairs were conducted, the report shall so state, providing the reason and circumstances (e.g., no significant storm event during monitoring period).

Documentation of the above shall be provided in an appendix to the report, as specified in Section I.1.h.i.

- f. Landfill Control Systems
  - 1) An evaluation of the effectiveness of all major landfill control systems (e.g., leachate, storm water and LFG), including associated monitoring facilities.
  - 2) Provide monitoring results for control systems, as applicable.
    - i. Tabular summary<sup>3</sup> and narrative discussion
    - ii. Flag any detected COC monitoring parameters for monitoring list management

- g. Unsaturated Zone Monitoring Results

Same general reporting format as for groundwater, including:

  - 1) Tabular summary<sup>3</sup> and narrative discussion
  - 2) Appropriate plots and graphs, as applicable
  - 3) CLs and updated monitoring lists, as applicable

- h. Groundwater Monitoring Results
  - 1) Monitoring Points
    - i. Site map – 8½ x 11” or legal size topographic or aerial map showing major site features, facility icons, monitoring points, etc.
    - ii. Tabular summary and/or geologic cross-section – show monitoring points, elevations, screened interval(s), total depth, water table elevation, soil type and other relevant information
  - 2) Field Parameter Monitoring
    - i. Tabular summaries of the results of monitoring for the monitoring period.<sup>4</sup>
    - ii. Groundwater elevation contour map(s) and/or flow net(s) showing gradient direction in the upper aquifer and any additional zone of saturation monitored;
    - iii. A narrative discussion of the groundwater elevation monitoring results,

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3. Tables of water quality monitoring data shall include appropriate headers and show monitoring point, sampling date, chemical group, constituent, units, analytical result, laboratory limits (MDL and PQL), exceedance flag, data type (statistical or nonstatistical), and updated CL. Nondetect results shall be shown relative to detection limit (e.g., “<0.3”).

including calculated gradient and flow velocity, times of highest and lowest elevations in the wells, and separation from wastes.

- 3) Background Monitoring
  - i. Data Screening
    - (a) Identify outliers
    - (b) Identify trends or other data disparities
  - ii. Tabular summary<sup>3</sup> and narrative discussion
  - iii. Plots and Other Graphical Methods<sup>4</sup>
    - (a) Time series plots
    - (b) Other graphical methods
  - iv. Updated CLs
    - (a) Describe or reference procedure for determining/updating CLs
    - (b) Provide or reference list of updated CLs
- 4) Compliance Monitoring
  - i. Detection
    - (a) Tabular summary of results<sup>3</sup>
    - (b) Narrative discussion of results
      - Release (e.g., exceedances and results of confirmation testing)
      - Potential Release
        - ⇒ Identify constituents
        - ⇒ How qualified (i.e., data analysis, detected in other media, related compound)
        - ⇒ Monitoring list updates
    - (c) Whether there was physically significant evidence of a release during monitoring period (e.g., sump leak)
    - (d) Updated detection monitoring parameter list (e.g., based on detection and COC monitoring results)
  - ii. Corrective Action
    - (a) Evaluate nature and extent of impacts
      - Tabular summary of results<sup>3</sup>
      - Narrative discussion of results
        - ⇒ Continuing exceedances
        - ⇒ Exceedances in other source media (e.g., LFG)
      - Water chemistry analysis, including cation/anion balance and illustrative plots (e.g., Piper, Trilinear, Schueller, and/or Stiff plot)
      - Potential onsite and offsite source(s)
      - Contaminant contour maps for representative constituents

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4. Scale plots for the range of data shown after excluding outliers. All plotted lines and symbols should be clearly discernible and distinguishable.

- (b) Evaluate corrective action progress and effectiveness
  - Plots and graphs
    - ⇒ Time series (i.e., for representative constituents at representative monitoring points)<sup>5</sup>
    - ⇒ Trend evaluation (e.g., best fit, Mann-Kendall, Sen's Slope)<sup>6</sup>
  - Narrative Discussion
    - ⇒ Concentration trends
    - ⇒ Changes in water quality chemistry
    - ⇒ Effectiveness of corrective action measures (e.g., landfill cover, LFG controls)
    - ⇒ Need for additional measures and/or monitoring wells
- iii. COC – Use similar format to Detection Monitoring
- i. Surface Water Monitoring Results
  - Same general reporting format as for groundwater
  - 1) Tabular summary<sup>3</sup> and narrative discussion
  - 2) Plots and graphs, as applicable
  - 3) Updated CLs and monitoring lists, as applicable
- j. Appendix Items
  - i. Standard Observations and Facility Monitoring Results
    - 1) Field logs,
    - 2) Site map showing location of area of concern
    - 3) Photos (e.g., before and after repairs)
  - ii. Field meter calibration logs;
  - iii. Field and laboratory test sheets;
  - iv. Pump information for each monitoring point/event
    - 1) Time of water level measurement;
    - 2) Elevation of the pump intake relative to the elevation of the screened interval;
    - 3) Method of purging
      - ⇒ Type of pump (or other device) used for purging;
      - ⇒ Purging rate;
      - ⇒ Equipment and methods used to monitor pH, temperature, and conductivity during purging;
      - ⇒ Calibration of the field equipment;
      - ⇒ Results of purge water testing (i.e., pH, temperature, conductivity, and turbidity);

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5. Time series plot required for each constituent for which there are three or more data points, including nondetect values.

6. Trend evaluation required for each constituent with four or more data points above the PQL.

- ⇒ Method of disposing of the purge water) to remove all portions of the water that was in the well bore while the sample was being taken; and
- 4) The type of pump - or other device - used for sampling, if different than the pump or device used for purging.
- v. Copies of other relevant reports or data (e.g., results of soil gas/LFG monitoring required by the LEA); and
- vi. Compact disk (CD), including:
  - 1) Copy of monitoring report in (preferably combined) PDF format
  - 2) Excel spreadsheet of monitoring data for monitoring period

## 2. **Annual Monitoring Summary Report**

An Annual Monitoring Summary Report (Annual Report) summarizing monitoring results for the prior year shall also be prepared and submitted in accordance with this Order. The report may be submitted as part of the Second Semiannual Report for each year. The Annual Report shall include the following information:

- a. A table of contents (as above) and a written summary of the monitoring results for the year, indicating any changes made or observed since the previous annual report.
- b. A comprehensive discussion of the compliance record, including any necessary repairs, improvements, and/or corrective action measures implemented or planned to bring the Discharger into full compliance with the WDRs and WQPS.
- c. Tabular and graphical summaries of the results of the prior year, including, representative time series plots.
- d. A summary of the results of water chemistry analysis of water quality data collected during the prior year.
- e. Appendix Items
  - i. A copy of the Sample Collection and Analysis Plan (updated as necessary, per WDR Monitoring Specification G.27).
  - ii. A copy of the most recent aerial topographic survey map for the site. (First aerial survey required to be performed per WDR Closure Specification E.2).
  - iii. Electronic copies of the following on CD
    - 1) Historical monitoring data collected under this and previous MRPs
      - ⇒ Provide in a tabular format necessary for statistical analysis (e.g., Excel) per Section 40420(h)
      - ⇒ Provide for all control systems (i.e., leachate, LFG, and storm water); media (i.e., surface water, unsaturated zone, and groundwater); and monitoring programs (i.e., background, detection, and corrective action)
      - ⇒ Provide for field parameter monitoring, including groundwater

elevation and estimated flow direction and gradient);

- ⇒ Provide for at least previous 10 years (or for as long as monitoring has been conducted at a given monitoring point).
- ⇒ Organize tables as specified in Footnote 3.

2) The monitoring report in (preferably combined) PDF format.

- iv. Evidence to the Regional Board's Executive Officer that acceptable financial assurance instrument(s) have been provided for closure, post-closure, and corrective action.

### 3. **COC Monitoring Report**

The five-year COC monitoring report shall be submitted in the semiannual report for the monitoring period in which five-year COC sampling was conducted. The COC monitoring report shall be submitted by the applicable due date specified in Table I.5 below. Consistent with Section G.3.c.iii above, the first COC Monitoring Report under this Order shall be submitted by **31 January 2014**.

### 4. **Other Reports**

- a. Notifications -- Required notifications under Title 27 (e.g., tentative release, leachate seep, extended repairs) shall be submitted within 7 days of event unless otherwise specified under this Order or the Standard Provisions.
- b. Updated Water Quality Protection Standard (WQPS) Report – An updated WQPS Report shall be submitted concurrent with, or as part of, the next semiannual monitoring report due after submission of the five-year COC monitoring report above. The first WQPS Report under this Order shall therefore be submitted by **31 July 2014** and then every five years thereafter.

Consistent with WQPS Specification F.1, the WQPS for each water-bearing media at the site shall be as follows:

- i. COCs -- As listed in Table J.2 (same list for all water-bearing media).
- ii. CLs
  - 1) Unsaturated Zone -- As established for lined lateral expansion consistent with MRP Section F and WDR Monitoring Specification G.8.
  - 2) Groundwater – As specified in Table J.2 based on the First Semester 2011 monitoring report). For other inorganic COCs, see Section G.2.b.i.
  - 3) Surface Water -- As established per WDR Monitoring Specification G.8 and MRP Section H.1.c.
- iii. Compliance Points
  - 1) Point of Compliance (POC) Wells
    - ⇒ All downgradient and cross gradient landfill unit perimeter wells (presently MWs-2, 5, and 7)
    - ⇒ Any future wells that meet the above criteria.
  - 2) Other Compliance Wells

- ⇒ All upgradient landfill perimeter wells potentially within the zone of influence of the landfill (i.e., MW-6);
- ⇒ All impacted wells beyond the POC (presently MWs-3 and MY).
- ⇒ Any future wells that meet either of the above criteria.

iv. Compliance Period (Section 20410)

The landfill began operations in 1977 and is still in operation. Assuming a one year closure period, the compliance period is 35 years plus the number of years actively operated under this Order. Beginning the year after earliest possible landfill closure (2013), the minimum compliance period would extend to at least the year 2048.

5. **Reporting Schedule**

The semiannual and annual reports shall be submitted to the Board in accordance with the following schedule for the calendar period in which samples were taken or observations made:

**Table I.5**

<u>Report</u>	<u>End of Reporting Period</u>	<u>Date Report Due</u>
First Semiannual	30 June	<b>31 July</b>
Second Semiannual	31 December	<b>31 January</b>
Annual Report	31 December	<b>31 January</b>

Reports that do not comply with the above-required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the WDRs.

The Discharger shall implement the above monitoring program on the effective date of this Program. The transmittal letter accompanying monitoring reports submitted under this Order shall, as required under the SPRR (Provision 5, *General Requirements, REPORTING REQUIREMENTS*), 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.

Ordered by: \_\_\_\_\_  
PAMELA C. CREEDON, Executive Officer

\_\_\_\_\_  
30 March 2012

Attachments  
JDM

**Table J.1  
 Groundwater Monitoring Schedules**

<b>A. Field Parameter Monitoring<sup>1</sup></b>			
All Wells			
<u>Monitoring Parameter</u>	<u>Units</u>	<u>Frequency</u>	<u>Data Analysis<sup>2</sup></u>
Dissolved Oxygen (DO)	mg/L	Semiannually	n/a
Elevation, Groundwater	feet MSL	Semiannually	n/a
Oxidation-Reduction (Redox) Potential	millivolts	Semiannually	n/a
pH	pH units	Semiannually	n/a
Specific Conductance	µS/cm	Semiannually	n/a
Temperature	°C, °F	Semiannually	n/a
Turbidity	NTU	Semiannually	n/a

1. Field parameter monitoring shall be conducted concurrent with other required groundwater monitoring programs under this Order.
2. Concentration limits not required for field parameters.

<b>B. Background Monitoring<sup>1</sup></b>			
Background Wells			
<u>Monitoring Parameter</u>	<u>Units</u>	<u>Frequency</u>	<u>Data Analysis</u>
See Tables J.1.A and J.1.C.			

1. Background monitoring shall include field parameter and compliance monitoring conducted at background wells.

<b>C. Compliance Monitoring</b>			
<b>a. Detection</b>			
Background and Point of Compliance Wells			
<u>Monitoring Parameter</u>	<u>Units</u>	<u>Frequency</u>	<u>Data Analysis</u>
<i>General Parameters:</i>			Tolerance Interval
Alkalinity, Total	mg/L <sup>3</sup>	Semiannually	---
Dissolved Oxygen (DO)	mg/L	Semiannually	---
Chemical Oxygen Demand (COD)	mg/L <sup>3</sup>	Semiannually	---
pH	pH units	Semiannually	Parametric
Specific Conductance	µS/cm	Semiannually	Parametric
Total Dissolved Solids (TDS)	mg/L	Semiannually	Parametric
Total Hardness	mg/L <sup>3</sup>	Semiannually	---

<u>Monitoring Parameter</u>	<u>Units</u>	<u>Frequency</u>	<u>Data Analysis</u>
<i>General Minerals:</i>			
<i>Major Anions:</i>			Statistical
Bicarbonate Alkalinity	mg/L <sup>3</sup>	Semiannually	Tolerance Interval ---
Chloride	mg/L	Semiannually	Parametric
Sulfate	mg/L	Semiannually	Parametric
<i>Major Cations:</i>			Tolerance Interval
Calcium	mg/L	Semiannually	---
Magnesium	mg/L	Semiannually	---
Potassium	mg/L	Semiannually	---
Sodium	mg/L	Semiannually	---
<i>Dissolved Metals:<sup>4</sup></i>			
<i>Common:</i>			Tolerance Interval
Iron	µg/L	Annually	----
Manganese	µg/L	Annually	----
Aluminum	µg/L	Annually	----
Barium	µg/L	Annually	----
Sulfide	µg/L	Annually	----
<i>Heavy:</i>			Tolerance Interval
Arsenic	µg/L	Annually	----
Cadmium	µg/L	Annually	----
Chromium	µg/L	Annually	----
Hexavalent Chromium	µg/L	Annually	Nonstatistical
Lead	µg/L	Annually	----
Mercury	µg/L	Annually	----
<i>VOCs:<sup>5</sup></i>			
<i>Alcohols:</i>			
Tert-Amyl methyl ether	µg/L	Semiannually	Nonstatistical
Tert-Butyl alcohol	µg/L	Semiannually	Nonstatistical
Tert-Butyl ethyl ether	µg/L	Semiannually	Nonstatistical
Isobutyl alcohol	µg/L	Semiannually	Nonstatistical
di-Isopropyl ether	µg/L	Semiannually	Nonstatistical
<i>CFCs:</i>			
Carbon Tetrachloride (Freon-10)	µg/L	Semiannually	Nonstatistical
Chloroform (Freon-20)	µg/L	Semiannually	Nonstatistical
Trichlorofluoromethane (Freon-11)	µg/L	Semiannually	Nonstatistical
Trichlorotrifluoroethane (Freon-113)	µg/L	Semiannually	Nonstatistical

<u>Monitoring Parameter</u>	<u>Units</u>	<u>Frequency</u>	<u>Data Analysis</u>
<i>Halogenated:</i>			
<i>Common:</i>			
1,2-Dichloroethane (DCA)	µg/L	Semiannually	Nonstatistical
1,1-Dichloroethene (DCE)	µg/L	Semiannually	Nonstatistical
Trans-1,2-DCE			
Tetrachloroethene (PCE)	µg/L	Semiannually	Nonstatistical
1,1,2-TCA	µg/L	Semiannually	Nonstatistical
Trichloroethene (TCE)	µg/L	Semiannually	Nonstatistical
1,1,1,2-Tetrachloroethane	µg/L	Semiannually	Nonstatistical
1,1,2,2-Tetrachloroethane	µg/L	Semiannually	Nonstatistical
Vinyl chloride	µg/L	Semiannually	Nonstatistical
<i>Trihalomethanes:</i>			
Bromodichloromethane	µg/L	Semiannually	Nonstatistical
1,2-Dibromoethane (Ethylene dibromide; EDB)	µg/L	Semiannually	Nonstatistical
<i>Other:</i>			
Bromochloromethane	µg/L	Semiannually	Nonstatistical
Methyl chloride (Chloromethane)	µg/L	Semiannually	Nonstatistical
<i>Interferences:</i>			
<i>Common:</i>			
Methyl bromide (Bromomethene)	µg/L	Semiannually	Nonstatistical
Methylene chloride	µg/L	Semiannually	Nonstatistical

**b. Corrective Action<sup>1,2</sup>**

Background and Compliance Wells

<u>Monitoring Parameter</u>	<u>Units</u>	<u>Frequency</u>	<u>Data Analysis</u>
<i>General Minerals:</i>			Statistical
<i>Major Anions:</i>			Tolerance Interval
Nitrate – Nitrogen	mg/L	Semiannually	Parametric
<i>VOCs:<sup>5</sup></i>			
<i>Alcohols:</i>			
Methyl tert-butyl ether (MTBE)	µg/L	Semiannually	Nonstatistical
<i>Benzene Compounds:</i>			
<i>BTEX:</i>			
Benzene	µg/L	Semiannually	Nonstatistical
Ethylbenzene	µg/L	Semiannually	Nonstatistical
Toluene	µg/L	Semiannually	Nonstatistical
Xylenes (total)	µg/L	Semiannually	Nonstatistical

<u>Monitoring Parameter</u>	<u>Units</u>	<u>Frequency</u>	<u>Data Analysis</u>
<i>Other:</i>			
n-Butylbenzene	µg/L	Semiannually	Nonstatistical
<i>CFCs:</i>			
Dichlorodifluoromethane (Freon-12)	µg/L	Semiannually	Nonstatistical
<i>Halogenated:</i>			
<i>Common:</i>			
Cis-1,2-DCE	µg/L	Semiannually	Nonstatistical
1,1-DCA	µg/L	Semiannually	Nonstatistical
Tetrachloroethene (PCE)	µg/L	Semiannually	Nonstatistical
1,1,1-Trichloroethane (TCA)	µg/L	Semiannually	Nonstatistical
<i>Trihalomethanes:</i>			
Bromoform (Tribromomethane)	µg/L	Semiannually	Nonstatistical
Dibromochloromethane (Chlorodibromomethane)	µg/L	Semiannually	Nonstatistical
<i>Other:</i>			
Chloroethane	µg/L	Semiannually	Nonstatistical
<i>Interferences:</i>			
<i>Common:</i>			
Acetone	µg/L	Semiannually	Nonstatistical
<b>c. COC Monitoring<sup>1</sup></b>			
All Wells			
All Table J.2 COCs not listed in Table G.1.J.1.C.a above.	See Table J.2	Every 5 years	Statistical/ Nonstatistical

1. Monitoring program shall be conducted concurrently with other required groundwater monitoring programs under this Order.
2. Compliance monitoring programs shall include background monitoring required to meet monitoring goals and performance standards per Monitoring Specifications G.9, G.11, and G.14.
3. Report units for this constituent as "mg/L as CaCO<sub>3</sub>".
4. Samples shall be filtered prior to performing dissolved inorganics analysis.
5. Unknown chromatographic peaks shall be reported, along with an estimate of the concentration of the unknown analyte per Monitoring Specification G.36.

**Table J.2  
 Constituents of Concern (COCs),  
 Approved USEPA Analytical Methods, & Concentration Limits**

<b>A. Inorganic COCs</b>				
<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>		
		<u>Unsaturated Zone<sup>1</sup></u>	<u>Ground-water</u>	<u>Surface Water</u>
<i>General Parameters (mg/L, except as noted):</i>				
Alkalinity, Total <sup>2</sup>	2320B	----	---- <sup>3</sup>	38
Chemical Oxygen Demand (COD) <sup>2</sup>	410.4	----	---- <sup>3</sup>	----
Dissolved Oxygen, mg/L	360.	----	---- <sup>3</sup>	----
pH, pH units	50.	----	6.7 - 8.1	7.4
Specific Conductance, µS/cm	20.	----	288	06
Total Dissolved Solids (TDS)	2540C	----	219	30
Total Hardness <sup>2</sup>	2340B	----	---- <sup>3</sup>	----
<i>General Minerals:</i>				
<i>Major Anions</i>				
Alkalinity, Bicarbonate <sup>2</sup>	230B	----	---- <sup>3</sup>	38
Chloride	300	----	9.9	12
Sulfate	300	----	4.7	11.4
Nitrate – Nitrogen	300	----	3.0	0.29
<i>Major Cations:</i>				
Calcium	200.7/600	----	---- <sup>3</sup>	----
Sodium	200.7/600	----	---- <sup>3</sup>	----
Magnesium	200.7/600	----	---- <sup>3</sup>	----
Potassium	200.7/600	----	---- <sup>3</sup>	----
<i>Dissolved Metals, µg/L:</i>				
<i>Common:</i>				
Iron	200.9/200.8	----	1,410 <sup>4</sup>	2,880 <sup>4</sup>
Manganese	200.7/600	----	171 <sup>4</sup>	15 <sup>4</sup>
Aluminum	200.7/600	----	660 <sup>4</sup>	---- <sup>3</sup>
Barium	200.7/600	----	60 <sup>4</sup>	165 <sup>4</sup>
Sulfide	9030B	----	---- <sup>3</sup>	---- <sup>3</sup>

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>		
<i>Heavy:</i>				
Arsenic	200.9/200.8	----	PQL	PQL
Cadmium	200.7/600	----	---- <sup>3</sup>	MDL
Chromium	200.7/600	----		PQL
Hexavalent Chromium	28.6/636	----	---- <sup>3</sup>	MDL
Lead	200.9/200.8	----	---- <sup>3</sup>	MDL
Mercury	7470A	----	---- <sup>3</sup>	MDL
<i>Other:</i>				
Antimony	200.7/600	----	---- <sup>3</sup>	MDL
Beryllium	200.7/600	----	---- <sup>3</sup>	MDL
Boron	200.7/600	----	---- <sup>3</sup>	----
Cobalt	200.7/600	----	---- <sup>3</sup>	PQL
Copper	200.7/600	----	21 <sup>4</sup>	PQL
Cyanide	335.4/900	----	---- <sup>3</sup>	MDL
Molybdenum	200.7/600	----	---- <sup>3</sup>	---- <sup>3</sup>
Nickel	200.9/200.8	----		PQL
Selenium	200.9/200.8	----	---- <sup>3</sup>	MDL
Silver	200.7/600	----	---- <sup>3</sup>	MDL
Thallium	200.7/600	----	---- <sup>3</sup>	11 <sup>4</sup>
Tin	200.7/600	----	---- <sup>3</sup>	MDL
Vanadium	200.7/600	----	66 <sup>4</sup>	14 <sup>4</sup>
Zinc	200.7/600	----	---- <sup>3</sup>	MDL

1. Unsaturated zone CLs required only for lateral expansion per MRP Section .
2. Report units for this constituent as "mg/L as CaCO<sub>3</sub>".
3. 5-year COC data not provided for this constituent.
4. CL not provided for this constituent. Interim CL set equal to 3 x highest historical concentration, excluding outlier(s).

<b>B. Organic COCs</b>		
VOCs, µg/L		
<i>Alcohols:</i>	8260B	MDL
Tert-Amyl methyl ether		
Tert-Butyl alcohol		
Tert-Butyl ethyl ether		
Isobutyl alcohol		
di-Isopropyl ether		

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>
Methyl tert-butyl ether (MTBE)		
<i>Benzene Compounds:</i>	8260B	MDL
<i>BTEX:</i>		
Benzene		
Ethylbenzene		
Toluene		
Xylenes (total)		
<i>Other:</i>		
n-Butylbenzene		
sec-Butylbenzene		
tert-Butylbenzene		
Bromobenzene		
Chlorobenzene		
1,2,4-Trimethylbenzene		
1,3,5-Trimethylbenzene		
n-Propylbenzene		
o-Dichlorobenzene (1,2-DCB)		
m-Dichlorobenzene (1,3-DCB)		
1,2,4-Trichlorobenzene		
Bromochloromethane		
Bromodichloromethane		
Bromoform (Tribromomethane)		
Chloroethane		
1,2-Dibromoethane (Ethylene dibromide; EDB)		
Dibromochloromethane (Chlorodibromomethane)		
trans-1,2-DCE Methyl chloride (Chloromethane)		
p-Dichlorobenzene (1,4-DCB)		
<i>CFCs:</i>	8260B	MDL
Carbon Tetrachloride (Freon-10)		
Chloroform (Freon-20)		
Dichlorodifluoromethane (Freon-12)		
Trichlorofluoromethane (Freon-11)		

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>
Trichlorotrifluoroethane (Freon-113)		
<i>Hologenated:</i>	8260B	MDL
<i>Common:</i>		
1,1-Dichloroethene (DCE)		
Cis-1,2- DCE		
Trans-1,2-DCE		
1,1-Dichloroethane (1,1-DCA)		
1,2-DCA		
Tetrachloroethene (PCE)		
1,1,1-Trichloroethane (TCA)		
1,1,2-TCA		
Trichloroethene (TCE)		
1,1,1,2-Tetrachloroethane		
1,1.2,2-Tetrachloroethane		
Vinyl chloride		
<i>Trihalomethanes:</i>		
Bromochloromethane		
Bromodichloromethane		
Bromoform (Tribromomethane)		
1,2-Dibromoethane (Ethylene dibromide; EDB)		
Dibromochloromethane (Chlorodibromomethane)		
<i>Other:</i>		
Methyl chloride (Chloromethane)		
Chloroethane		
<i>Industrial Solvents, Common:</i>	8260B	MDL
Carbon disulfide		
Methyl ethyl ketone (MEK: 2-Butanone)		
<i>Interferences, Common:</i>	8260B	MDL
Acetone		
Methyl bromide (Bromomethene)		
Methylene chloride		
<i>Miscellaneous:</i>	8260B	MDL

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>
Acetonitrile		
Acrolein		
Acrylonitrile		
Chloroprene		
trans-1,4-Dichloro-2-butene		
Ethyl methacrylate		
Hexachlorobutadiene		
Hexachloroethane		
2-Hexanone (Methyl butyl ketone)		
Iodomethane (Methyl iodide)		
Methacrylonitrile		
Methylene bromide (Dibromomethane)		
4-Methyl-2-pentanone (Methyl isobutylketone)		
Naphthalene		
2-Nitropropane		
Propionitrile		
Styrene		
<i>Props:</i>	8260B	MDL
1,2-Dichloropropane		
1,3-Dichloropropane		
2,2-Dichloropropene		
1,1-Dichloropropene		
cis-1,3-Dichloropropene		
1,2,3-Trichloropropane		
1,2-Dibromo-3-chloropropane		
trans-1,3-Dichloropropene		
3-Chloropropene (Allyl chloride)		
<i>Other Organic COCs:</i>		
<i>Semi-VOCs:</i>	8270B <sup>4</sup>	MDL
Acenaphthene		
Acenaphthylene		
Acetophenone		
2-Acetylaminofluorene (2-AAF)		
4-Aminobiphenyl		

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>
Anthracene		
Benzo[a]anthracene (Benzanthracene)		
Benzo[b]fluoranthene		
Benzo[k]fluoranthene		
Benzo[g,h,i]perylene		
Benzo[a]pyrene		
Benzyl alcohol		
Bis(2-ethylhexyl) phthalate		
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)		
p-Chloroaniline		
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)		
Dibenz[a,h]anthracene		
Dibenzofuran		
Di-n-butyl phthalate		
3,3-Dichlorobenzidine		
2,4-Dichlorophenol		
2,6-Dichlorophenol		
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		

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>
Di-n-octyl phthalate		
Diphenylamine		
Ethyl methanesulfonate		
Famphur		
Fluoranthene		
Fluorene		
Hexachlorobenzene		
Hexachloropropene		
Indeno(1,2,3-c,d)pyrene		
Isophorone		
Isosafrole		
Kepone		
Methapyrilene		
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		

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>
Phenol		
p-Phenylenediamine		
Polychlorinated biphenyls (PCBs; Aroclors)		
Pronamide		
Pyrene		
Safrole		
1,2,4,5-Tetrachlorobenzene		
2,3,4,6-Tetrachlorophenol		
o-Toluidine		
2,4,5-Trichlorophenol		
0,0,0-Triethyl phosphorothioate		
sym-Trinitrobenzene		
<i>Organochlorine Pesticides:</i>	808A	MDL
Aldrin		
$\alpha$ -BHC		
$\beta$ -BHC		
$\gamma$ -BHC (Lindane)		
$\delta$ -BHC		
Chlorobenzilate		
$\alpha$ -Chlordane		
$\gamma$ -Chlordane		
Chlordane – not otherwise specified		
DBCP		
4,4'-DDD		
4,4'-DDE		
4,4'-DDT		
Diallate		
Dieldrin		
Endosulfan I		
Endosulfan II		
Endosulfan sulfate		
Endrin		
Endrin aldehyde		
Endrin ketone		
Heptachlor		
Heptachlor epoxide		

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>
Hexachlorocyclopentadiene		
Isodrin		
Methoxychlor		
Toxaphene		
<i>Polychlorinated Biphenols:</i>	8082	MDL
Aroclor 06		
Aroclor 22		
Aroclor 232		
Aroclor 242		
Aroclor 248		
Aroclor 254		
Aroclor 260		
<i>Organophosphorus Pesticides:</i>	84A	MDL
Chlorpyrifos		
Diazinon		
Dimethioate		
Disulfoton		
Ethion		
Famphur		
Malathion		
Parathion		
Parathion-ethyl		
Parathion-methyl		
Phorate		
<i>Chlorinated Herbicides:</i>	85A	MDL
2,4-D (2,4-Dichlorophenoxyacetic acid)		
Dicamba		
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)		
MCPA		
MCPP		
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)		
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)		
Pentachlorophenol		

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>
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1. Unknown chromatographic peaks shall be reported, along with an estimate of the concentration of the unknown analyte per Monitoring Specification G.36.

## **INFORMATION SHEET**

ORDER NO. R5-2012-0026  
SIERRA COUNTY DEPARTMENT OF  
PUBLIC TRANSPORTATION AND PUBLIC WORKS  
LOYALTON LANDFILL  
SIERRA COUNTY

### **Background Information**

The Loyalton Landfill is an active municipal solid waste (MSW) landfill on a 29-acre site about 1.25 miles east-southeast of the Loyalton. The facility has been in operation since May 1977, accepting household and commercial wastes. The Discharger has owned and operated the facility since startup. The landfill receives between 2,500 to 4,500 tons of waste per year. The landfill currently consists of a single, unlined waste management unit referred to as Landfill 1 (LF-1).

LF-1 consists of an unlined disposal module on the northern half of the site, referred to as the Northern Fill Area (NFA), and fractional acreage of another module, the Southern Fill Area (SFA), which is otherwise undeveloped. The SFA may be further developed in the future, although current development plans are limited to the NFA. LF-1's footprint is currently about 10.9 acres, including all but the western end of the NFA (10.5 acres) and a small area of historical fill at the eastern end of the SFA (0.4 acres). The landfill operated under the Subtitle D liner exemption for small rural landfills (see 40 CFR 258.1(f)) until March 2003, when groundwater impacts were confirmed at the site. The existence of these impacts disqualified the landfill from the Subtitle D liner exemption. Since March 2003, landfill development has, for economic reasons, been limited to vertical expansion over the March 2003 landfill footprint so as to avoid placing Subtitle D composite liner.

### **Groundwater**

Upper zone groundwater occurs in heterogeneous alluvial deposits believed to have limited connectivity. Shallow groundwater at the site is confined or semi-confined in most locations. Depths to groundwater range from about 39 to 85 feet and the average groundwater elevation is about 4,986 feet MSL. The average gradient is about 0.014 ft/ft toward the west-northwest. There are currently six groundwater monitoring wells at the site, including one upgradient (MW-6); two side gradient (MWs-3 and 5); three down gradient (MWs-2, 7 and MY).

Groundwater impacts, including low concentrations of volatile organic compounds (VOCs), have been historically detected at the site since the late 1990s. Dichlorodifluoromethane (Freon 12), the most commonly detected VOC, has been detected in MW-MY up to 9.5 µg/L. Other VOCs have also been sporadically detected. No VOCs have been detected in any of the wells at the site since the Second Half 2008, however. No clear trends for general minerals have been observed in wells at the site.

### **Updated WDRs**

#### **WDR Specifications**

These updated WDRs prescribe updated requirements for landfill construction, operations, and corrective action for a non-Subtitle D exempt, MSW landfill. WDR Discharge

Specifications B.1 through B.3 require that any lateral expansion of the landfill be limited to the remaining undeveloped portion (about 10 acres) of the 21-acre disposal area authorized under previous WDRs and that any such expansion be constructed with a Subtitle D composite liner and LCRS or equivalent (see Construction Specifications C.2 through C.5). The WDRs limit vertical expansion of the landfill to the maximum closure grade specified under the facility's current PC/PCMP (5080 feet MSL, including cover), or as approved in the updated PC/PCMP required under Provision I.9 of this Order.

### Required Demonstrations

Discharge Specification B.4 requires submission of a JTD and adoption of revised WDRs by the Central Valley Water Board for any lateral expansion proposal not including a Subtitle D compliant liner and LCRS. At a minimum, such a proposal would need to include the following demonstration:

- Subtitle D Liner Exemption -- That the landfill has re-qualified for the Subtitle D rural landfill exemption by completing the required corrective action proof period under Title 27; and
- Compliance With Title 27 -- That the proposed waste containment system complies with the Title 27 requirements applicable to a non-MSW landfill (i.e., prescriptive clay liner and LCRS).

To show compliance with Title 27, the JTD may alternatively attempt to demonstrate that specified site characteristics, including natural geologic materials, are adequately protective of surface and groundwater such that a prescriptive Title 27 containment system is not required for containment of wastes. Such a demonstration would need to address factors such as the following:

- Size of the landfill
- Hydraulic conductivity and transmissivity of underlying soils
- Depth to ground water and variations in depth to ground water
- Background quality of ground water
- Current and anticipated use of the ground water
- Annual precipitation

To further demonstrate that an unlined expansion of the landfill would not need an LCRS, the JTD would need to make the following demonstration:

- That historical water quality impacts at the site are attributable to a source other than landfill leachate;
- That the landfill, as expanded, will:
  - Not include significant amounts of MSW; or
  - Not generate more leachate than a non-MSW landfill; or
  - Otherwise not generate significant amounts of leachate; and
- That, in view of the site characteristics, an LCRS is not needed to protect surface and groundwater from leachate, and would either be:

- Infeasible to install; or
- Ineffective in collecting and conveying leachate.

### Required Technical Reports

The WDRs also require submission of technical reports related to landfill design, corrective action, and financial assurances, as follows:

Facility Investigation -- Provision I.12 requires that the Discharger investigate and submit a report as to the condition and operational status all landfill monitoring and control facilities at the site, including plans and schedules, as necessary, for restoring such facilities to good working order.

Financial Assurances -- Provision I.7 requires that the Discharger provide corrective action cost estimates for known and reasonably foreseeable releases, while Provision I.8 requires that the Discharger obtain and maintain financial assurances in at least the amount of these approved cost estimates. Provision I.9 requires that the Discharger submit for approval an updated PC/PCMP, including updated financial assurance cost estimates for postclosure maintenance and monitoring under this Order, while Provision I.10 requires that the Discharger obtain and maintain financial assurances in at least the amount of these cost estimates, as approved under the updated PC/PCMP. Provision I. 12 requires that the Discharger submit an annual demonstration as to the adequacy and ongoing viability of such financial assurance mechanisms.

Corrective Action -- Provision I.14 requires that the Discharger submit a technical report consisting of an evaluation of leachate and LFG as a possible sources of groundwater impacts; and a schedule for implementation of any necessary operational improvements and/or passive corrective action measures to reduce or control leachate and/or landfill gas. (Because VOC concentrations in groundwater at the site appear to be naturally attenuating, the provision does not require that the Discharger propose active corrective action measures).

### Monitoring and Reporting Program

The MRP requires monitoring of all major landfill control systems and Title 27 water-bearing media, as applicable, including soil pore water, groundwater, and surface water. Monitoring lists and schedules for each required groundwater monitoring program are provided in Table J.1 of the MRP. The MRP also requires that the Discharger submit a proposal for a revised MRP to update the monitoring parameter lists for each media, as warranted, based on the results of monitoring. Semiannual monitoring is required for most groundwater detection and corrective action monitoring parameters, while five-year monitoring is required for all other landfill constituents of concern (COCs). Table J.2 provides a full list of all landfill COCs under the Water Quality Protection Standard, along with test methods and concentration limits.

### Monitoring Data Analysis

Monitoring Approach -- The Discharger historically used both intrawell and interwell approaches to evaluate detection monitoring data at the site, although only interwell monitoring was specified under previous (1996) WDRs. In 1993, the Discharger submitted a report proposing that detection monitoring be conducted on an intrawell basis. The report was never formally approved, however, and was not incorporated into previous WDRs. WDR Monitoring Specification G.7 requires that monitoring for inorganic constituents be conducted on an interwell basis absent a satisfactory demonstration that intrawell monitoring is justified at the site. WDR Provision I.13 requires the Discharger to submit, for Executive Officer approval, a technical report proposing updated statistical and nonstatistical data analysis methods for monitoring consistent with Title 27 requirements and the monitoring specifications of this Order.

Non-Prescriptive Methods -- In addition to the prescriptive data analysis methods specified in Title 27, the Monitoring Specifications under these WDRs allow the Discharger to use non-prescriptive methods considered to be more stringent than Title 27 standards per Section 20080(a)(?). Such methods include both statistical and nonstatistical methods, as follows:

#### Statistical Methods

- *Gamma 95 Percent Upper Prediction Limit (Gamma 95% UPL) Method*<sup>1</sup>
  - ⇒ Parametric statistical method
  - ⇒ Background data matched with a specific gamma distribution
  - ⇒ Method provides higher statistical power (e.g., lower triggering concentrations and lower risk of false positives)
- *Pass -in-3, 6-Month Statistical Retest*<sup>2</sup>
  - ⇒ Method more powerful than Title 27 prescriptive (Pass 2-in-3, 30-day) retest.
- *Paired Difference Analysis* (i.e., for surface water monitoring)
  - ⇒ Parametric statistical method
  - ⇒ Statistics run on differences between two monitoring points
  - ⇒ Used in surface water monitoring to screen out background variance

#### Nonstatistical Methods

##### *California Nonstatistical Data Analysis Method (Pass 2-in-3)*

Nonstatistical Trigger -- For each monitoring point, identify each analyte (i.e., monitoring program or COC) in the current sample that exceeds its respective PQL and/or MDL. The Discharger shall conclude that the null hypothesis has been rejected if:

- 
1. Simultaneous Gamma Prediction Limits for Groundwater Monitoring Applications, Gibbons and Bhaumik (2006); One-Sided Approximate Prediction Intervals for at Least p of m Observations From a Gamma Population at Each of r Locations, Bhaumik and Gibbons (2006).
  2. Method requires that Discharger conduct initial sampling at start of monitoring period, first retest at mid-period, and second retest, if necessary, just prior to end of monitoring period.

- ⇒ The data contain two or more analytes that equal or exceed their respective MDLs; and/or
- ⇒ The data contain one analyte that equals or exceeds its PQL.

The method thus has both single constituent and multi-constituent release triggers.

- *Pass 1-in-2, 3-month nonstatistical retest*<sup>3</sup>
  - ⇒ More powerful than California Nonstatistical Data Trigger (Pass 1-in-2, 90-day) retest.

Because they have higher effectiveness in detecting a release, the above methods are deemed to be more stringent than Title 27 requirements per Section 20080(a).

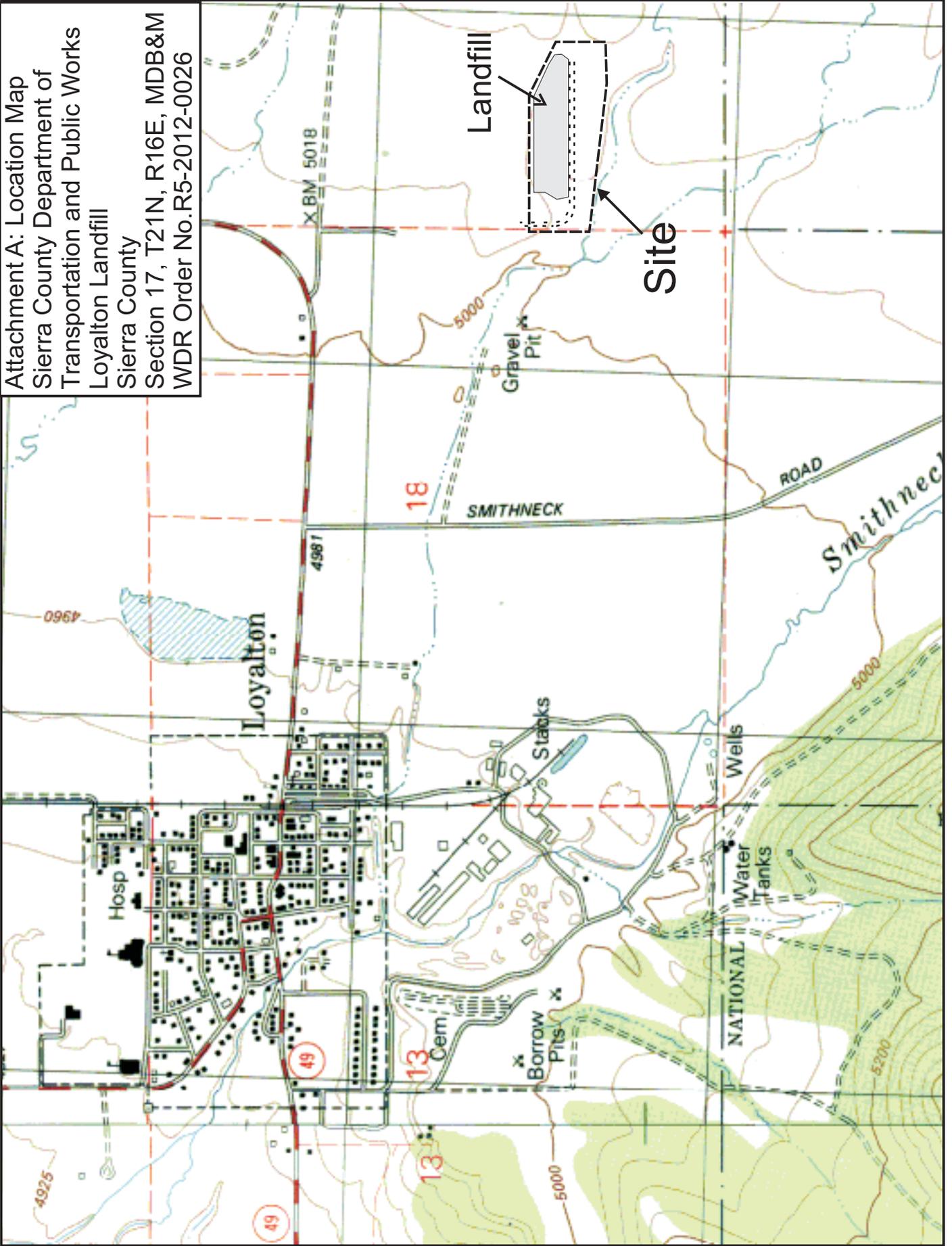
### Reporting

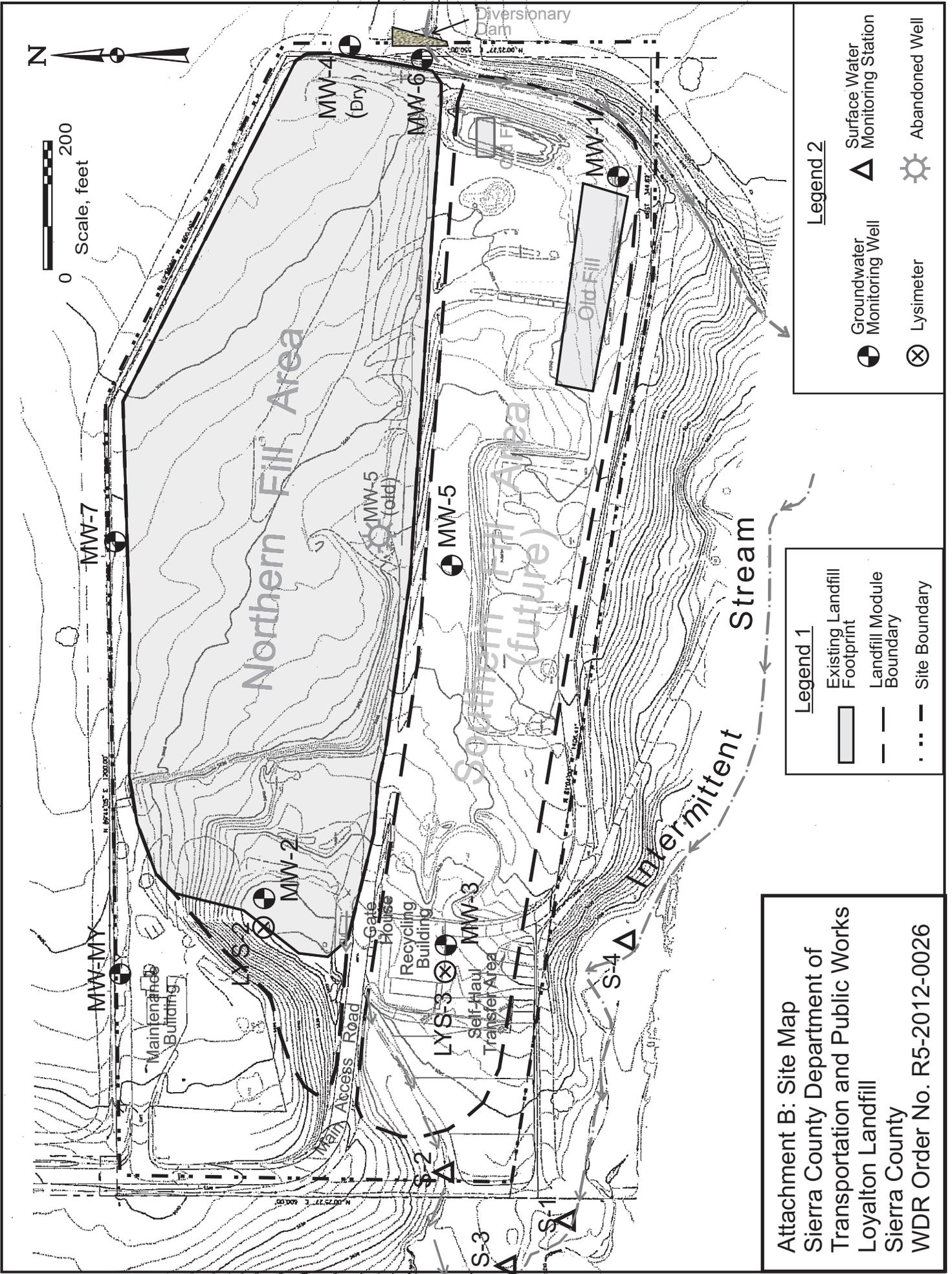
In addition to semiannual, annual, and 5-year reporting, MRP Section I requires that, after completion of the first 5-year COC monitoring event under this Order, the Discharger submit an updated Water Quality Protection Standard (WQPS) Report including COCs, CLs, monitoring points, Point of Compliance, and compliance period consistent with Section 20390 and the WQPS Specifications of the WDRs.

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3. Method requires that Discharger conduct initial sampling at start of monitoring period and re-sampling just prior to end of monitoring period.

Attachment A: Location Map  
Sierra County Department of  
Transportation and Public Works  
Loyalton Landfill  
Sierra County  
Section 17, T21N, R16E, MDB&M  
WDR Order No.R5-2012-0026





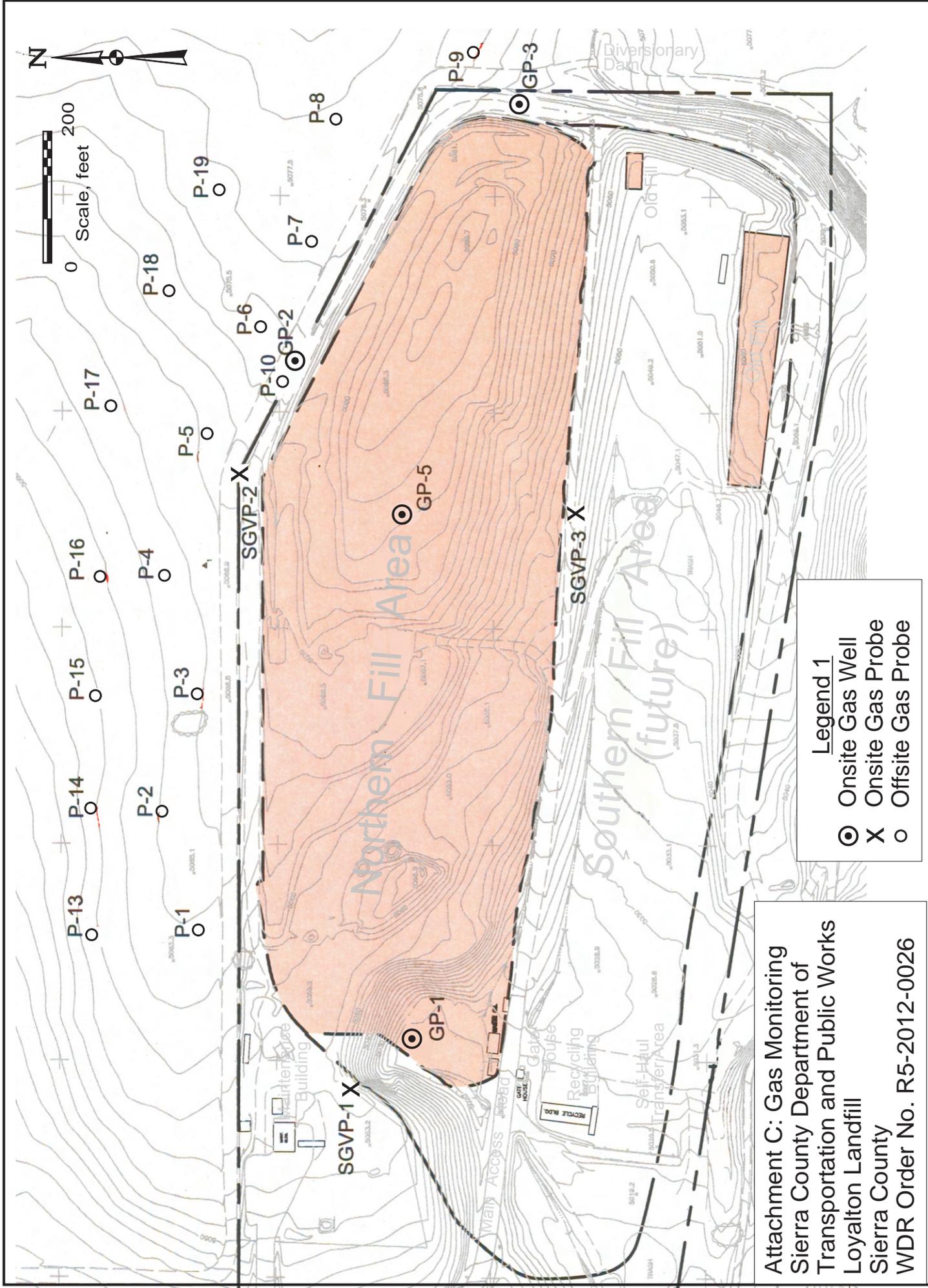
**Legend 1**

- Existing Landfill Footprint
- Landfill Module Boundary
- Site Boundary

**Legend 2**

- Groundwater Monitoring Well
- Lysimeter
- Abandoned Well
- Surface Water Monitoring Station

Attachment B: Site Map  
 Sierra County Department of Transportation and Public Works  
 Loyaltan Landfill  
 Sierra County  
 WDR Order No. R5-2012-0026



**Legend 1**

- Onsite Gas Well
- ⊙ Onsite Gas Probe
- Offsite Gas Probe

Attachment C: Gas Monitoring  
 Sierra County Department of  
 Transportation and Public Works  
 Loyalton Landfill  
 Sierra County  
 WDR Order No. R5-2012-0026