CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2016-0042-01

WASTE DISCHARGE REQUIREMENTS FOR WASTE MANAGEMENT OF ALAMEDA COUNTY, INC. ALTAMONT LANDFILL AND RESOURCE RECOVERY FACILITY CLASS II AND CLASS III LANDFILL CONSTRUCTION, OPERATION, CLOSURE, POST-CLOSURE MAINTENANCE, AND CORRECTIVE ACTION ALAMEDA COUNTY

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

1. Waste Management of Alameda County, Inc. (hereinafter Discharger or WMAC) owns and operates the Altamont Landfill and Resource Recovery Facility (hereinafter ALRRF or Facility) about 3.5 miles east of the City of Livermore's eastern boundary, in Sections 15, 16, 17, and 21, T2S, R3E, MDB&M. The facility is a municipal solid waste (MSW) landfill regulated under authority given in Water Code section 13000 et seq.; California Code of Regulations, title 27 (Title 27), section 20005 et seq.; and 40 Code of Federal Regulations section 258 (a.k.a. Subtitle D) in accordance with State Water Resources Control Board (State Water Board) Resolution 93-62.

2. The following documents are attached to this Order and hereby incorporated into and made a part of this Order by reference:

   a. Attachment A – Site Location Map
   b. Attachment B – Predevelopment Topography and Land Use Map
   c. Attachment C – Site Plan and 2014 Topography
   d. Attachment D – Groundwater Sampling Locations and Fault Zone Map
   e. Attachment E – Surface Water and Unsaturated Zone Monitoring Locations
   f. Attachment F – Fill Area 1- Existing Landfill Gas Collection System, Fill Area 2- Proposed Landfill Gas Collection System, and Perimeter Landfill Gas Probes
   g. Attachment G – Site Geologic Hazards and Shallow Groundwater Locations
   h. Attachment H – Existing Storm Water Drainage Plan
   i. Attachment I – Conceptual Final Covers and Storm Water Drainage Plan

3. On 30 July 2015, the Discharger submitted an amended Report of Waste Discharge (ROWD) as part of the Joint Technical Document (JTD) for the landfill. The ROWD contains the applicable information required in Title 27. On 30 November 2015, the Discharger submitted revisions to the JTD to better reflect and/or clarify landfill design and operation. On 16 December 2015 the Discharger requested that the revised waste discharge requirements (WDRs) Order not include waste discharge requirements for a

composting facility since the Discharger is currently reevaluating and considering other siting alternatives. Therefore, these revised WDRs do not include provisions allowing construction or operation of a composting facility.

4. The information in the ROWD/JTD and supporting documents submitted thereafter has been used in revising current WDRs Order R5-2009-0055.

5. Upon adoption of WDR Order R5-2016-0042, Monitoring and Reporting Program (MRP) R5-2009-0055 shall remain in effect until 23 September 2016, on which date MRP Order R5-2016-0042 shall go into effect.

SITE DESCRIPTION

6. The facility is on a 2,064 acre property at 10840 Altamont Pass Road, in the unincorporated area of Alameda County, as shown in Attachment A. The existing and future landfill area is approximately 472 acres (in plan) of which 260 acres (Fill Area 1 plus Fill Area 2 Unit 1 Phase 1) have been constructed. Existing landfill waste management units (hereafter WMU or Unit) consist of the following:

   a. Fill Area 1 Unit 1, an unlined landfill Unit covering 122 acres;
   b. Fill Area 1 Unit 2, a lined landfill Unit covering 112 acres:
   c. Fill Area 2 Unit 1, Phase 1, a lined landfill Unit covering 25 acres.

   The facility is comprised of Alameda County Assessor's Parcel Numbers (APN) 99B-6225-1, 99B-6250-1, 99B-6275-1-1, 99B-6275-1-2, 99B-6275-1-3, 99B-6275-1-4, 99B-6062-1-2, 99B-6062-2, 99B-6062-3-4, and 99B-6062-5-2.

7. The existing and future permitted landfill area is shown in Attachment B, which also shows predevelopment topography and land use. The ALRRF is located in a sparsely populated area. The ALRRF lies within a land use area zoned as "A" District, which is primarily used for agricultural purposes (public utility and sanitary landfill uses are granted within this designation through the issuance of a conditional use permit (CUP)). Adjacent land uses within 1,000 feet of the facility include dry-land farming, cattle grazing, power-producing windmills, water storage and conservation. Subsidiaries of FPL Energy, Inc., leases portions of the facility property for the installation and operation of power-producing windmills.

8. The facility began disposal operations in 1980 and currently operates under permits issued to WMAC, formerly known as Oakland Scavenger Company (OSC). The ALRRF is currently owned and operated by WMAC, a wholly owned subsidiary of Waste Management (WM).

9. The Facility is located near the crest of the Diablo Range in an area characterized by steep rolling hills (Altamont Hills). Facility elevations vary from a low of about 450 feet above mean sea level (MSL) in the southeast corner, to a high of 1262 feet above MSL on the highest hill in the west portion of the existing Facility.

10. In addition to storm-water runoff, natural groundwater seepage contributes to the discharge from the Altamont Hills. The locations of formerly identified groundwater seeps in the vicinity of the ALRRF are shown on Attachment G. These seeps were identified on the National Wetlands Inventory "Altamont" and "Byron Hot Springs" maps prepared by U. S. Department of Interior in 1987, and in the RUST Environment & Infrastructure, Inc. *Class II Expansion Area Site Characterization Report, Altamont Landfill and Resource Recovery Facility* (RUST report [1994a]). Groundwater seepage is common in the region as evidenced by areas of standing water in the valley bottoms that remains throughout the end of the dry season. The general existing storm-water flow directions for Fill Area 1 and Fill Area 2 are shown on Attachment H.

11. The Discharger's JTD indicates that there are 11 municipal, domestic, industrial, or agricultural groundwater supply wells within one mile of the site. The wells include, 2S/3E 18C 2, 2S/3E 18J 1, 2S/3E 18J 2, 2S/3E 18J 5, 2S/3E 18J 6, 2S/3E 18J 7, 2S/3E 18 J 8, 2S/3E 19H 1, 2S/3E 21E 1, 2S/3E 21K 1, and 2S/3E 29C 1. There are no on-site water supply wells.

12. The facility accepted approximately 1.17 million tons of waste material in 2014 which included 1.124 million tons of municipal solid waste, 2,951 tons of C&D waste, 8,550 tons of friable asbestos waste, and 35,724 tons of other special and designated waste. The Discharger estimates that in the next five years the Facility will receive an average 1.21 million tons of waste per year. In the Discharger's JTD revisions, the Discharger reported that on 16 November 2015, it received approval from Bay Area Air Quality Management District to increase the decomposable waste disposal capacity in Fill Area 1 by 3.92 million tons. Therefore, according to the Discharger, Fill Area 1 may not reach its capacity for ten years or more depending on Fill Area 2 filling, future flow rates and types of waste received. The Discharger is permitted to accept peak daily waste disposal quantities of 11,150 tons per day. As currently planned, when Fill Area 2 is completely constructed it will have a disposal capacity of 36.1 million tons of decomposable waste, not including intermediate and final covers, alternative daily covers and other beneficial reuses. The Discharger's current waste disposal permit limits the total decomposable waste placed in Fill Area 2 to 40 million tons (less the actual decomposable tons placed in Fill Area 1 that exceed 47.1 million tons). The waste footprint for Fill Area 2 will be less than or equal to the permitted 250 acres. The current design for Fill Area 2 footprint is 237 acres but may be modified in the future up to but not exceeding 250 acres as Fill Area 2 is developed. If the average daily discharge follows current projections the Discharger estimates it will take approximately 59 years for Fill Area 2 to reach capacity.

13. The revisions to the current WDRs addressed in these revised WDRs include but are not limited to:

    a. provisions requiring changes/improvements to the groundwater, surface water, and unsaturated zone monitoring systems;
    b. addition of prohibitions, specifications, provisions, and monitoring and reporting requirements associated with construction of Class II surface impoundments;

c. provisions requiring the Discharger to submit Title 27 compliant water quality protection standards (WQPS) including appropriate concentration limits and an approved sample collection and analysis plan;
d. corrective actions for gas and/or leachate releases from Fill Area 1; and
e. provisions requiring a technical report on impacts on the Discharger's groundwater monitoring system from releases of storm water from unlined storm water sedimentation ponds.

14. On 24 April 2009, the Central Valley Water Board issued Order R5-2009-0055 in which the landfill WMUs at the facility were classified as Class II and Class III Units for the discharge of non-hazardous waste, municipal solid waste, and designated waste. This Order continues to classify the landfill Units as Class II and Class III Units in accordance with Title 27.

15. The existing and future landfill WMUs authorized by this Order are described as follows:

Unit	**Area**	**Liner/LCRS[1], Components[2]**	**WMU Classification & Status**
Fill Area 1, Unit 1	122 acres	Unlined	Class III
Fill Area 1, Unit 2	113 acres	Lined	Class II
Fill Area 2, Unit 1	208 acres	Lined	Class II, 208 acres with 25 acres currently active[3]
Fill Area 2, Unit 2	29 acres	Lined	Class II, future
Fill Area 2 Liquid Waste Surface Impoundment	2.5 acres in plan view, (8 M gallons)	Double Lined	Class II, constructed but not active to date
Fill Area 1 and 2[4] Liquid Waste Surface Impoundment	1 acre in plan view (4.6 M gallons)	Double Lined	Class II, future
Fill Area 1 and 2[4] Liquid Waste Surface Impoundment	1 acre in plan view (4.8 M gallons)	Double Lined	Class II, future

[1] LCRS – Leachate collection and removal system
[2] All liner systems are composite liner systems unless otherwise noted
[3] Fill Area 2, Unit 1 footprint is currently designed for 208 acres. However, at the time of adoption of this Order only Phase 1 of Fill Area 2 Unit 1 has been constructed accounting for 25 acres. The acreages of Fill Area 2 Units 1 and 2 may be modified, but the combined acreage shall not exceed 250 acres.
[4] The final acreages, storage depths, and capacities of the leachate surface impoundments can change but the storage capacity is based on a finalized water balance analysis.

16. The base of refuse at the toe of Fill Area 1 is estimated to be at an elevation of 710 feet above MSL. The current top-of-fill elevations for Fill Area 1 range from between

approximately 1150 feet and 1160 feet above MSL, based on 31 December 2014 topography. The conceptual final grading plan for Fill Area 1 is shown in Attachment I. The base of refuse at the sump for Fill Area 2 Unit 1 is designed at an elevation of approximately 540 feet above MSL. As shown on the Fill Area 2 Unit 1 conceptual final grading plan (Attachment I), the currently proposed maximum elevation of Fill Area 2 Unit 1 is 990 feet above MSL. The conceptual final grading plans, including acreages, elevations, volumes, and design capacities, for Fill Areas 1 and 2 may be modified as long as they are consistent with the design parameters specified in the Solid Waste Facility and BAAQMD permits.

17. The existing on-site facilities at the ALRRF as shown in Attachment C include: existing WMUs, soil stockpiles and borrow areas, administrative offices, a transfer truck waste staging area, recycling operations (green and wood waste grinding and transfer, construction and demolition debris transfer, white goods, tire shredding, and landfill gas), an active landfill gas extraction system, a landfill gas-to-energy plant, landfill gas to liquid natural gas conversion facility; landfill gas flares, a household hazardous waste (HHW) storage area, a maintenance building, fueling facility, truck wash facilities and wash water storage, a wastewater treatment plant, organic waste processing facility, and a meteorological station.

18. The following future facilities at the ALRRF which are described in these WDRs:

    a. Addition of Class II designated solid waste disposal area within Fill Area 2 Unit 1 area through construction of future phases;
    b. Addition of Class II designated solid waste disposal area within Fill Area 2 Unit 2 area;
    c. Addition of three Class II surface impoundments (one has already been constructed) for designated liquid waste storage discharged from Fill Area 1 and Fill Area 2 approximately located as shown in Attachment C;
    d. Addition of a Materials Recovery Facility (MRF) to complement and expand on the recovery of recyclables, wood waste and green waste materials at the ALRRF; and
    e. Addition of a truck wash facility in Fill Area 2.

19. On 9 October 1991, the United States Environmental Protection Agency (USEPA) promulgated federal MSW regulations under the Resource Conservation and Recovery Act (RCRA), Subtitle D. These regulations are under 40 Code of Federal Regulations section 258, and are hereinafter referred to as either “Subtitle D” in reference to the RCRA federal law that required the regulations or “40 C.F.R. section 258.XX”. These regulations apply to all California Class II and Class III landfills that accept MSW. State Water Board Resolution 93-62 requires the Central Valley Water Board implement in WDRs for MSW landfills the applicable provisions of the federal MSW regulations that are necessary to protect water quality, and in particular the containment provisions that are either more stringent or that do not exist in Title 27.

20. This Order implements the applicable regulations for discharges of solid waste to land through Prohibitions, Specifications, Provisions, and monitoring and reporting requirements. Prohibitions, Specifications, and Provisions are listed in Sections A through H of these WDRs below, and in the Standard Provisions and Reporting Requirements (SPRRs) dated December 2015 attached to this Order and hereby incorporated into and made a part of this Order. Monitoring and reporting requirements are included in the Monitoring and Reporting Program (MRP) R5-2016-0042 and in the SPRRs. In general, requirements that are either in regulation or otherwise apply to all MSW landfills are considered to be "standard" and are therefore in the SPRRs. Any site-specific changes to a requirement in the SPRRs are included in the applicable section (A through H) of these WDRs, and the requirement in the WDRs supersedes the requirement in the SPRRs.

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

PREVIOUS ENFORCEMENT

22. On 11 April 2014 Board staff issued a notice of violation to the Discharger following the Water Board staff inspection on 15 November 2013. Excavation of Fill Area 2 had begun without prior submission of design plans and specifications, as well as approval of construction quality assurance plans as required by WDRs Order R5-2009-0055.

23. On 23 May 2014 Board staff requested a revised corrective action plan for groundwater monitoring well E-20B. Water Board staff addressed comments from the Discharger regarding VOC detection in monitoring well E-20B and PC-1. The Discharger stated that the source of VOCs in groundwater monitoring wells is due to landfill gas migration and not a release of landfill leachate. Board staff noted amongst other concerns that the revised corrective action plan should propose detailed corrective action measures to be taken to prevent the migration of VOCs beyond Fill Area 1, and to reduce VOC impacts in groundwater around E-20B such that water quality protection standards are achieved. The revised corrective action plan should include corrective action monitoring of the Discharger's active landfill gas extraction system.

24. On 1 August 2014 Board staff issued a notice of violation to the discharger for accepting hazardous waste. On 27 February 2014 the discharger accepted 7,200 gallons (30.12 tons) of waste water containing 280 micrograms per liter of Dinoseb that was improperly profiled by the generator. This hazardous waste was discharged to one of the site's solidification basins, and after it was solidified it was discharged into the landfill. The Discharger was required to completely remove the entire volume of illegally discharged

Dinoseb hazardous waste. Dinoseb has historically been detected twice in the WMU's leachate and three times in the unsaturated zone.

25. On 10 October 2014 Board staff notified the Discharger that it had reviewed the Discharger's revised E-20B corrective action plan (CAP). The revised CAP continued to assert that the source of VOCs in E-20B was due to landfill gas migration. Board staff did not concur based on the information provided and required additional work to be done by the Discharger. The Discharger proposed installing a groundwater monitoring well downgradient of E-20B; Board staff concurred but required a well cluster that monitors both shallow and deep groundwater. Board staff also reiterated that if the Discharger's method of corrective action is through changes in size and operation of its active landfill gas (LFG) extraction system in Fill Area 1 the Discharger must provide information regarding the size and operation of its LFG extraction well system including but not limited to gas extraction data, well construction details, vacuum, flow, volume, radius of influence estimates, and concentrations of VOCs in LFG for LFG wells located along the western boundary of Fill Area 1. These WDRs require the Discharger to provide information regarding its active landfill gas extraction system and the effectiveness thereof so long as the Discharger proposes to use landfill gas extraction as a corrective action measure.

26. On 13 October 2014 Board staff notified the Discharger of review of the Discharger's 2013 Annual Groundwater Monitoring Report and the First Semiannual 2014 Groundwater Monitoring Report. Board staff identified several issues related to these monitoring reports such as deficiencies in the Discharger's groundwater sampling, analysis, and reporting methods. WMAC provided a re-evaluation of the site hydrogeologic conceptual model in multiple reports and letters in 2015 and 2016, where they stated that if constituents flowed along bedding planes, they would reach depths exceeding 1,000 feet below MSL, and at this depth, groundwater is characterized as mineralized/saline water. Staff concurred with this interpretation, and in a 6 May 2016 letter, staff stated that it is not currently requiring wells to be installed to intercept these bedding planes.

27. On 10 February 2015 the Discharger notified Water board staff of VOCs detected in MW-12 during the First Quarter 2015 monitoring. The Discharger reported that a 9 January 2015 sample contained detections of three VOCs at concentrations below the reporting limit. The Discharger noted that resampling of this well will be conducted and resampling results will be reported under separate cover and if detected again Water board staff will be notified.

28. On 2 September 2015 Board staff sent the Discharger a summary of the 11 August 2015 meeting with Permitting and Compliance and Enforcement staff and the Discharger. Topics discussed included the installation of the liner system in Fill Area 2, Phase 1, the location of a newly proposed Class II surface impoundment, compliance with WDRs and Title 27, closure of Fill Area 1, proposal of 111 acre composting facility atop Fill Area 1, Financial Assurance requirements, and reporting requirements. These

WDRs require the Discharger to comply with the information required prior to discharge to the newly constructed landfill WMU and proposed Class II surface impoundment.

29. On 16 December 2015 the Discharger notified Water board staff of detections of five-year constituent of concern parameters in E-03A, MW-5A, and E-05 in the Second Semiannual 2015 monitoring report. Cyanide was detected in E-03A above the reporting limit, the reanalysis results were non-detect for cyanide. Semi-VOCs were detected above the reporting limit in MW-5A and E-05.

WASTE CLASSIFICATION AND UNIT CLASSIFICATION

30. The Discharger proposes to continue to discharge wastes classified under Title 27 as non-hazardous solid waste and inert waste to unlined Fill Area 1, Unit 1. The Discharger also proposes to discharge/continue to discharge, wastes classified under Title 27 as designated waste, non-hazardous solid waste, and inert waste to composite lined Fill Area 1, Unit 2 and composite lined Fill Area 2. These classified wastes may be discharged only in accordance with Title 27, Resolution 93-62 and Subtitle D, as required by these WDRs.

31. Active unlined landfill Units at the facility are “existing Units” under Title 27 that were permitted before 27 November 1984 and may continue to accept waste in the “Existing Footprint” until ready for closure unless waste receipts do not meet the timeframes and amounts in Title 27, section 21110, or they are required to close sooner to address environmental impacts or other regulatory concerns. The “Existing Footprint” as defined in Title 27, section 20164 is the area that was covered by waste as of the date that the landfill Unit became subject to Subtitle D. The Existing Footprint for the active unlined Fill Area 1 Unit 1 of the landfill is shown on Attachment C.

32. Active landfill Units at the facility with pre-Subtitle D liner systems may continue to accept waste in the “Existing Footprint” until ready for closure unless waste receipts do not meet the timeframes and amounts in Title 27, section 21110, or they are required to close sooner to address environmental impacts or other regulatory concerns. The “Existing Footprint” as defined in Title 27, section 20164 is the area that was covered by waste as of the date that the landfill Unit became subject to Subtitle D. There are no WMUs with pre-Subtitle D liner systems at ALRRF.

33. The Discharger also proposes to continue to discharge designated waste to Class II landfill WMUs Fill Area 1 Unit 2 and Fill Area 2. These wastes include asbestos, commercial and industrial waste, MSW, nonhazardous ash, nonhazardous petroleum and/or metal contaminated soils, salty waste, construction and demolition waste, treated auto shredder waste, treated wood waste, solidified wastes, and dewatered sewage and wastewater treatment plant waste sludges. These classified wastes may be discharged only in accordance with Title 27, Resolution 93-62, and Subtitle D as required by this Order.

34. The Discharger proposes to discharge landfill leachate, a designated liquid waste, into a Class II surface impoundment constructed to accept landfill leachate from Fill Area 2 WMU. The 8-million gallon Class II surface impoundment covers approximately 2.5 acres in plan view with a maximum storage depth of approximately 12 feet excluding the minimum 2-feet minimum freeboard requirement. On 20 August 2015, Central Valley Water Board staff received a Leachate Storage Impoundment Design Report (Design Report) for the 8 million gallon Class II surface impoundment and leachate conveyance system from Fill Area 2, Unit 1, Phase 1 WMU and subsequent future phases to the surface impoundment. On 30 October 2015 Central Valley Water Board staff provided comments on the original Design Report and subsequent amendments stating that the proposed design, construction, and construction quality assurance specifications in the Design Report complies with Title 27 requirements. The Discharger estimates that construction of the surface impoundment will be completed prior to adoption of these WDRs. These WDRs include prohibitions, specifications, provisions, and monitoring and reporting requirements associated with the design, construction, operation, and water quality protection standards pertaining to the 8 million gallon surface impoundment and leachate conveyance system prior to placement of waste in the surface impoundment. The Discharger's current water balance was only based on leachate production from Fill Area 2 to determine that volume capacity of an 8 million gallon surface impoundment was sufficient to contain leachate from Fill Area 2 phase 1 through at least phase 5. However, the Discharger in its JTD proposes to discharge truck wash water, contaminated groundwater, and any other non-hazardous liquid waste compatible with the surface impoundment containment system. These additional flows of waste were not accounted for in the Discharger's water balance which determined adequacy of volumetric capacity of the 8 million gallon surface impoundment. However, these WDRs allow for the discharge of these other liquid wastes to the 8 million gallon surface impoundment so long as the Discharger provides a revised water balance that is approved by the Central Valley Water Board Executive Officer that includes containment of these additional liquid wastes as well as demonstrates that these non-hazardous liquid wastes are compatible with the waste containment liner system.

35. The Discharger proposes to discharge landfill leachate, a designated liquid waste, from Fill Area 1 and Fill Area 2 into two new Class II surface impoundments to be constructed in the near future in the location shown in Attachment C. These WDRs include prohibitions, specifications, provisions, and monitoring and reporting requirements associated with the design, construction, operation, and water quality protection standards pertaining to the two 4.6 and 4.8 million gallon Class II surface impoundments prior to placement of liquid waste in the WMUs. The two new Class II surface impoundments are approximately 1-acre size each in plan view with a maximum storage depth of approximately 10-feet excluding the minimum 2-feet minimum freeboard requirement. The Discharger in its JTD proposes to discharge truck wash water, contaminated groundwater, and any other non-hazardous liquid waste compatible to the surface impoundment containment system. These WDRs allow for the discharge of these other liquid wastes to the currently proposed 4.6 and 4.8 million gallon surface impoundments so long as the Discharger provides a water balance that is approved by the Central Valley Water Board Executive Officer that includes containment of these

additional liquid wastes as well as demonstrates that these non-hazardous liquid wastes are compatible with the waste containment liner system. These WDRs also allow the Discharger to increase the acreage, depth and storage capacity of the proposed 4.6 and 4.8 million gallon surface impoundments in order to accommodate the additional non-hazardous liquid waste containment so long as the storage capacity does not increase by more than 50% and the additional liquid waste is included in a water balance approved by the Central Valley Water Board Executive Officer. These WDRs also permit the Discharger to construct the two proposed surface impoundments as one storage impoundment in the location shown in Attachment C so long as the combined storage capacity does not exceed 14.1 million gallons (includes allowable 50% increase).

36. The Discharger also proposes to have the option to accept other liquid designated wastes in the Class II surface impoundments provided there is sufficient capacity. Prior to acceptance of other liquid designated wastes as mentioned above, this Order requires the Discharger to submit an amended ROWD that identifies and characterizes the waste, demonstrates that the waste is compatible with the surface impoundment liner system, includes any additional measures necessary such as odor and/or vector control, and includes a water balance that demonstrates the impoundments have adequate capacity to accept the waste.

37. Water Code section 13173 defines “Designated Waste” as either of the following:

    a. Hazardous waste that has been granted a variance from hazardous waste management requirements pursuant to Health and Safety Code section 25143.
    b. Nonhazardous waste that consists of, or contains, pollutants that, under ambient environmental conditions at a WMU, could be released in concentrations exceeding applicable water quality objectives or that could reasonably be expected to affect beneficial uses of the waters of the state as contained in the appropriate state water quality control plan.

    Designated waste can be discharged only at Class I WMUs, or at Class II WMUs which comply with Title 27 and have been approved by the Central Valley Water Board for containment of the particular kind of waste to be discharged.

38. The Discharger proposes to continue to discharge wastes containing greater than one percent (>1%) friable asbestos to the landfill Units. These wastes are classified as ‘hazardous’ under California Code of Regulations, title 22 (Title 22). However, these wastes do not pose a threat to groundwater quality and California Health and Safety Code, section 25143.7 permits their disposal in any landfill that has WDRs that specifically permit the discharge, provided that the wastes are handled and disposed of in accordance with applicable statutes and regulations.

39. The State Water Resources Control Board adopted Resolution No. 87-22 on 19 March 1987. This Resolution allows the discharge of shredder wastes to Class III landfills where WDRs allow such disposal. Currently these WDRs only allow shredder wastes that have been treated prior to discharge to WMUs at the ALRRF.

40. Treated (stabilized) auto shredder waste (TASW) is any non-recyclable waste from the shredding of automobile bodies (from which batteries, mufflers, mercury switches, and exhaust pipes have been removed), household appliances, and sheet metal. The Discharger proposed to continue to discharge TASW in the top lift of Fill Area 1, Unit 1 where it will not be exposed to acidic leachate. The Discharger also proposes to continue to use TASW as alternative daily cover, beneficial reuse material, or to dispose of it in all the applicable Class II landfill areas. In the past, TASW has been discharged at the landfill under a waiver from the Department of Toxic Substances Control (DTSC), and at the Class III unit, pursuant to Resolution No. 87-22. DTSC's waiver is currently under review and may be rescinded due to new data and information indicating TASW should be managed as a hazardous waste due to increasingly high concentrations of toxic metals, and concerns about the long-term effectiveness of the stabilization treatment process. If DTSC makes the determination that TASW is a special hazardous waste and requires management at a Class I facility, this Order prohibits the discharge of auto shredder waste (treated or untreated) at the Altamont Landfill.

41. The Discharger proposes to continue to discharge treated wood waste in the composite-lined Class II Units at the landfill. Specifications in these WDRs apply only to treated wood waste that is a hazardous waste, solely due to the presence of a preservative in the wood, and is not subject to regulation as a hazardous waste under the federal act. Treated wood that is not a hazardous waste can be handled as C&D debris or MSW, as appropriate, and the limitations and prohibitions for its handling as specified in these WDRs do not apply.

42. Title 22 defines "treated wood" that is a hazardous waste, to mean wood that has been treated with a chemical preservative for purposes of protecting the wood against attacks from insects, microorganisms, fungi, and other environmental conditions that can lead to decay of the wood and the chemical preservative is registered pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. Sec. 136 and following). This may include but is not limited to waste wood that has been treated with chromated copper arsenate (CCA), pentachlorophenol, creosote, acid copper chromate (ACC), ammoniacal copper arsenate (ACA), ammoniacal copper zinc arsenate (ACZA), or chromated zinc chloride (CZC).

43. Title 22, section 67386.11 allows treated wood waste to be discharged to a composite-lined portion of a MSW landfill that is regulated by WDRs issued pursuant to the Water Code provided that the landfill owner/operator:

    a. Comply with the prohibitions in Title 22, section 67386.3, which are:
        i. Treated wood waste shall not be burned, scavenged, commingled with other waste prior to disposal, stored in contact with the ground, recycled without treatment (except as in iii, below), treated except in compliance with Title 22, section 67386.10, or disposed to land except in compliance with Title 22, section 67386.11.

ii. Any label or mark that identifies the wood and treated wood waste shall not be removed, defaced, or destroyed.

iii. Treated wood waste many be recycled only by reuse when all of the following apply:

1) Reuse is on-site.

2) Reuse is consistent with FIFRA approved use of the preservative.

3) Prior to reuse, treated wood waste is handled in compliance with Title 22, division 4.5, chapter 34.

b. Ensure treated wood waste is managed at the landfill according to Title 22, division 4.5, chapter 34 prior to disposal.

c. Monitor the landfill for a release of constituents of concern associated with treated wood wastes and if a verified release is detected from the Unit where treated wood is discharged, the disposal of treated wood will be terminated at the Unit with the verified release until corrective action ceases the release.

d. Handle treated wood waste in a manner consistent with the applicable sections of the California Occupational Safety and Health Act of 1973.

44. The Discharger proposes to continue to operate a solidification process that receives non-hazardous liquid and semi-solid wastes. Typical liquid-content wastes that may be solidified include: grease trap waste; monitoring well purge water; commercial, industrial or residential waste waters and sludges; rinse waters; and sludges (excluding sewage) with total volatile organic content (VOC) of less than 1000 µg/L. The facility can also solidify the sludge that can be generated from the facility's Wastewater Treatment Plant. Currently, the solidification of non-hazardous liquid and semi-solid wastes takes place in clay-lined pits located in the Class II area to prevent rapid infiltration of the discharged liquid waste. Following discharge to the designated area, on-site soils, ash, ground wood waste, processed construction and demolition (C&D) debris, or non-hazardous contaminated soils are used to solidify any free liquid present in the designated area such that the moisture content of the resulting mixture is not in excess of the waste holding capacity. Depending on the analytical information for the wastes that were solidified, the solidified material is then disposed in the appropriate Class II or Class III landfill areas or used as alternative daily cover.

45. Title 27 section 20200(d) requires that the solidified waste does not contain "*liquid in excess of the moisture holding capacity as a result of waste management operations, compaction, or settlement.*" These WDRs require the Discharger to evaluate their solidification processes to show compliance with Title 27. These WDRs also require the Discharger to provide a technical report demonstrating that solidification operation does not result in the introduction of liquids into a solid waste WMU in excess of the moisture holding capacity of the WMU as a result of waste management operations, compaction, or settlement. In addition, these WDRs require that the Discharger provide Standard Operating Procedures for the solidification process.

46. Title 27, section 20690 allows the use of alternative daily cover (ADC) at MSW landfills upon approval by the Local Enforcement Agency (LEA) and concurrence from CalRecycle. Title 27, section 20705 provides the Water Board's regulations for all daily and intermediate cover including that it shall minimize the percolation of liquids through waste and that the cover shall consist of materials that meet the landfill Unit classification (Class II or Class III). The regulations also require that for non-composite lined portions of the landfill, that any contaminants in the daily or intermediate cover are mobilized only at concentrations that would not adversely affect beneficial uses of waters of the state in the event of a release. For composite-lined portions of the landfill, the regulations require that constituents and breakdown products in the cover material are listed in the water quality protection standard.

47. The Discharger uses the following materials approved by the LEA for ADC: TASW, shredded tires, solidified waste, biosolids (treated sewage sludge), combination biosolids and TASW, geosynthetic blankets and tarps, processed C&D material, and material recycling facility (MRF) fines. The Discharger has demonstrated to the LEA that these materials will minimize percolation of liquids through waste, and that they meet the Unit classification where they will be discharged.

48. In a letter dated 8 October 2014, Central Valley Water Board staff notified the Discharger that use of MRF fines on areas of the landfill that drain outside of the limits of the contiguous landfill Unit's leachate collection and removal systems (LCRS) has the potential to impact receiving surface water quality. These WDRs also find that use of the approved ADC on areas of the landfill that drain and/or percolate outside of the limits of the contiguous landfill Unit's LCRS also has the potential to impact receiving surface and/or groundwater quality. These WDRs require that the Discharger demonstrates to Central Valley Water Board staff satisfaction using quantitative methods equivalent to those specified in the letter that runoff and/or percolation from the LEA approved ADC will not degrade or pose a threat to receiving surface and/or groundwater quality if the Discharger proposes to use the ADC listed above on areas of the landfill that drain and/or percolate outside of the limits of the contiguous landfill Unit's LCRS. This demonstration may take removal of sediment or suspended solids into account for landfills where surface water drains to a sedimentation basin.

49. Landfills propose new ADC materials regularly in order to preserve landfill air space and to beneficially reuse waste materials. Title 27, section 20686 includes regulations for beneficial reuse, including use of ADC. Approval of ADC is primarily handled by the LEA and CalRecycle under Title 27, section 20690. This Order allows any ADC proposed for use at the facility after the adoption of this Order to be approved by Central Valley Water Board staff provided the Discharger has demonstrated it meets the requirements in Title 27, section 20705. The approved ADC materials will then be listed in the facility's WDRs during the next regular update or revision with information about the Discharger's demonstration. This Order also includes a requirement that ADC only be used in internal areas of the landfill unless the Discharger demonstrates that runoff from the particular ADC is not a threat to surface water quality and the demonstration has been approved

by Central Valley Water Board staff. The demonstration can take into account removal of sediments containing COCs from sedimentation basins.

50. Currently a non-operational wastewater treatment plant (WWTP) exists on the southeast side of Fill Area 1. Historically, the WWTP constructed in 1994 operated to treat landfill liquids prior to discharge under an USEPA National Pollution Discharge Elimination System Permit No. CA 0083763. Landfill liquids included leachate from Fill Area 1, contaminated groundwater from the Fill Area 1 underdrains and Groundwater Interceptor Barrier (after the VOC tank), LFG condensate, wash water from the equipment maintenance building, and compost contact water were combined and then treated on site at the WWTP. The WWTP was designed to treat 75,000 gallons/day and could treat up to 201,600 gallons per day during a peak flow event. The Discharger's JTD states that the treated WWTP effluent would then be used on site for dust control or irrigation, or, in rare circumstances, would be discharged off site in accordance with the Facility's approved NPDES permit. An exception to this was the hydrocarbon phase of the LFG condensate, which was transported off site for proper management. Some of the cleaner site liquids may have been used directly for dust control within the landfill footprint (e.g., truck wash water and heavy equipment wash water). Subsequently, the Discharger requested that the Central Valley Water Board rescind NPDES Permit No. CA 0083763 for surface water discharge to waters of the US.

51. On 22 June 2007, The Central Valley Water Board rescinded NPDES Permit No. CA 0083763. The WWTP ceased operation in February 2010. Currently, the WWTP is used as a wastewater plant (WWP) to store wastewater from various wastewater sources such as but not limited to Fill Area 1 leachate, and underdrains. The stored wastewater is used for dust control in the lined Class II landfill areas as allowed under Title 27 section 20340(g) where units have a leachate collection and removal system (LCRS) and contain waste of a similar classification to units from which the leachate was extracted. The Discharger currently has no NPDES permit that allows for surface water discharge from the WWP to waters of the US. The Discharger has proposed to construct three Class II surface impoundments to accommodate non-hazardous and designated waste liquids generated by Fill Area 1, Fill Area 2 and other sources.

52. Contained within Fill Area 1, Unit 1 is a closed hazardous and designated waste disposal area. This clay lined and capped unit, also known as the Red Star Area, contains mainly laundry wastewater treatment sludge, sandblasting residue, and small amounts of other designated wastes. This area was closed in 1987 by capping with a compacted clay layer and subsequent covering with MSW and finally overlain by the Unit 2 base liner. The area received a variance from DTSC regarding the final closure on 1 June 1998 and noted in the California Regulatory Notice Register 98, Volume No. 25-Z.

53. The exclusion of hazardous and designated wastes from the facility not approved by the Central Valley Water Board in accordance with Title 27 section 20210 is accomplished through load checking and waste screening, as described in the Hazardous Waste Exclusion Program included in the Joint Technical Document. Hazardous wastes that

are identified and require removal are temporarily stored at the hazardous waste storage area adjacent to the administration office. Shipment of hazardous site offsite is done under EPA ID No. CAD981382732. However, due to isolated instances in the past of improper disposal of hazardous and designated wastes to WMUs not classified to accept such waste these WDRs require the Discharger to expeditiously notify Central Valley Water Board staff of any violations and provide a schedule for the hazardous waste's removal and for unauthorized designated waste the removal and/or other mitigation activities in order to prevent leachate generation and a release from unauthorized disposal of waste.

GEOLOGY

54. The high point elevation at the Facility is a hill on the facilities north side measured at 1257 feet above mean sea level (MSL), while the lowest elevation of 540 feet above MSL is at the southern boundary of the waste management Facility.

55. The Facility was constructed on top of geological structures that formed as the result of compression and extensional forces applied over geologic time to the underlying stratum. After deposition of sediments and then consolidation, the area experienced an episode of compression, which produced the Altamont Anticline. Also associated with the compressional-folding are secondary fractures, identified on the facilities boring logs. The orientation of the dipping sedimentary beds is 10 to 30 degrees to the east-northeast. The geomorphic features indicate that the Altamont Anticline is a broad structure that trends north-northwest with an axis that skirts the far-western margin of the Facility (Attachment D). In addition, RUST (1998) also reported the presence of the Altamont Thrust Fault that underlies the WMU, which may have formed during the same compressional episode as the folding. The orientation of the Altamont Thrust Fault is not known. The stratigraphy under the landfill again experienced deformation as the region experienced extension. As a result, en echelon to the Altamont Anticline is a series of high angle normal faults that dip to the east.

56. Typical sediments encountered at the site consist of varying amounts of sandy silts and sandy clays (alluvium) at the surface, underlain by weathered mudstone and sandstone, and then predominantly mudstone and sandstone at depth. The rocks encountered at depth are typical of the Panoche Formation. Other rock types identified during previous investigations include mudstone, siltstone and shale, all of which are consistent interpretations of this formation that underlies the site.

57. The most prevalent unit at the site is mudstone, which, in vertical section, represents approximately 90% of the lithology encountered at the western portion of the site, and 50% to 70% of the lithology encountered at the eastern portion of the site. Different investigators have described the mudstone encountered in borings at the site as a light olive gray to grayish black weak claystone, mudstone, or clayey siltstone. Descriptions of weathering of the mudstone have ranged from generally fresh to weathered.

58. Fracturing has also been observed in the Panoche Formation deposits. The density of fracturing has been observed to be most prevalent near the ground surface and to decrease with depth. Woodward-Clyde Consultant's Report, "*Soil, Geology and Groundwater Investigation for the Proposed Altamont Sanitary Landfill Site*" (WCC [1975]) observed that the system of open fractures in the Panoche Formation extends to greatest depths (up to approximately 100 feet below ground surface [bgs]) beneath the hills. The depth of open fractures decreases to approximately 5 to 10 feet bgs beneath the stream valleys.

59. Descriptions of the sandstone beds encountered in the Panoche Formation during site investigations are consistent with the regional description of the Panoche Formation. The sandstone beds are laterally discontinuous and it is not possible to match sandstone beds observed in borings that are several hundred feet apart. Sandstone in these lenses has ranged from being weak and weathered within the top 50 to 75 feet bgs, to fresh, strong, and well cemented at greater depths. Sandstone beds are typically thin (on the order of 0.5 feet thick); however, they can be as thick as 30 feet or more.

FAULTING AND SEISMICITY

60. Tectonically, the Diablo Range is located in the moderately active central Coast Ranges and is part of the San Andreas transform area [RUST, 1994a]. Deformation in the region results primarily from north-northwest trending, right lateral strike-slip faults and secondarily by thrust faulting and folding associated with crustal shortening.

61. Individual faults are characterized by minor offset bedding, drag folding, and gouge zones averaging 0.5 to 1 inch, and up to 6 inches wide. Excavations near the landfill margin show that the siltstones and claystones tend to preserve faulting with distributed deformation across broad zones that have fracture orientations similar to the mapped faults north and south of the excavations. Excavations conducted by WLA (LFR Levine-Fricke, 2002) near the southern boundary of Fill Area 1 showed an absence of distinct fault zones across the projections of faults identified during geologic field mapping, and the presence of broad zones of greater fracturing and shearing along the projections of these fault zones. Overall, however, the investigations indicate that shallow bedrock in the area directly south of the facility southern boundary is pervasively fractured throughout, with a few broad areas of comparatively more intense fracturing. Data collected throughout the excavations demonstrate that the entire shallow bedrock package is fractured and sheared, consistent with previous interpretation regarding pervasive weathering of the upper portions of the Panoche formation at the site. The absence of distinct, well-defined fault zones makes it likely that groundwater flows through the highly fractured rock mass in a manner more similar to that of porous media rather than via fracture flow.

62. The Lookout Hill and Dibblee fault zones appear to cross the Facility and project through the railroad cuts south of Facility. Many small fractures and joints are present between the two fault zones, indicating pervasive deformation of the bedrock between primary zones of displacement. As indicated above, however, the data collected indicate that

the entire shallow bedrock package is fractured and sheared, consistent with previous interpretation regarding pervasive weathering of the upper portions of the Panoche formation at the site (see Attachment D).

63. The West fault has been mapped through Fill Area 2. The fault is mapped through the axis of the main canyon of Fill Area 2 and extends across a small saddle on the southern border of Fill Area 2. The West fault is steeply dipping, without a large mappable offset across the fault. The Huey fault daylights northeast of Fill Area 2 and has similar characteristics to the West fault (see Attachment D).

64. There are no known Holocene faults within 200 feet of the Facility property (Facility boundary). Potential active faults in the Area include the Midway fault (approximately 1.6 miles from the site), the Greenville fault (approximately 3.1 miles from the site), and the Corral Hollow-Carnegie fault (approximately 3.1 from the site) (RUST, 1994a). Major potentially active faults near the Altamont Hills region include the Calaveras, the San Andreas, Hayward, and Gray Valley Blind Thrust Segment 6 faults.

65. The Discharger's consultant, Geosyntec Consultants conducted an updated seismic site exposure evaluation in 2014 for the ALRRF, which incorporated historic seismicity, recent relevant studies of known active and potentially active faults and earthquake zones within a 62-mile (approximately 100 km) radius of the site, and recent studies of strong ground motion attenuation and duration. Based on a review of 13 potentially active faults, the design Maximum Credible Earthquake (MCE) for the site was established as either a moment magnitude (M_w) 6.7 event on the Great Valley blind thrust Segment 6, termed the near-field design event, or a M_w 7.9 event on the San Andreas Fault, termed the far-field design event. The expected median near-field bedrock MCE peak horizontal ground acceleration (PHGA) equals 0.72g and the expected median far-field bedrock MCE PHGA equals 0.10g. The expected median free-field bedrock MCE D_s equals 10.8 sec for the near-field MCE and 38.6 sec for the far-field MCE. The Greenville fault MCE was eliminated from consideration based on judgment, as the calculated PHGA for this event was significantly smaller (0.57g for M_w 6.9) than that of the Great Valley blind thrust Segment 6.

LANDSLIDES

66. The landfill property is situated in an area that is susceptible to mass movement on natural slopes. Landslide deposits occur in and around Fill Area 1. They are typically associated with dip slopes in the Panoche mudstone, and faulted and fractured areas. During the excavation of Unit 2 in Fill Area 1, six landslides occurred on the south-facing slope. The landslides may have been associated with unearthing and reactivating existing landslide deposits or with the fine sediments overlying deep fractured bedrock due to tectonics or weathering. Each of the six landslides was preceded by construction that increased the slope angle and then followed by periods of prolonged intense rainfall. The locations of the landslides in Fill Area 1 Unit 2 are shown in Attachment G.

67. There are several historical landslides within the footprint of the Fill Area 2 expansion. However, prior to installing the liner, the Discharger will remove these known landslides to achieve uniform soil properties. The Discharger has stated that if new landsides are unearthed during construction, they will be mapped and then removed. If the Discharger proposes to not remove any landslide within the Fill Area 2 footprint the Discharger shall submit a risk analysis report including a revised slope stability analysis report comparing the cost benefit for not removing the landslide versus the cost of repairing the landfill liner if it were to fail during the Unit's life, closure period, and post-closure maintenance period due to the landslide not being removed. Currently, the known locations of the landslides in Fill Area 2 are shown in Attachment G.

CLIMATE

68. The facility receives an average of about 13 inches of precipitation per year. For the 30-year period from 1971 to 2000, NOAA (2001) reports a normal annual precipitation of 14.8 inches at the Livermore Weather Station and 12.51 inches at Tracy Pumping Weather Station. Annual precipitation recorded at the facility weather station in 1997 was 10.85 inches (Simon, 1998). In 2004, 12.37 inches of precipitation was measured at the EPA ACAP study area on the south side of Fill Area 1, Unit 1. Precipitation at the project site within this range is typical of the Central Valley region. Rainfall is seasonal, with approximately 90 percent of the rainfall occurring between November and April. Snowfall is unusual at the site. Strong westerly winds from the Pacific coast are characteristic of the Altamont Pass area.

69. Evaporation data collected for the site between 1991 and 1997 indicate a mean inferred evaporation of 65.86 inches per year (Simon, 1998). For that time period (1991-1997), the highest mean monthly-inferred evaporation was calculated as 10.85 inches for July and the lowest mean monthly-inferred evaporation was calculated as 1.13 inches for December (Simon, 1998).

70. A meteorological (MET) station existed at the ALRRF in the 1990s but was dismantled in 1998 when it reached end of its functional life. A MET station was also installed at the site as part of the EPA sponsored alternative cover assessment program (ACAP) but, once the program was terminated, the station was removed. WMAC installed a Bay Area Air Quality Management District (BAAQMD) approved MET station in 2010 to generate site-specific climatological data, including precipitation, wind direction, evaporation and temperature data. The station is located approximately 75 feet south of a gravel parking area, near the maintenance building at an elevation of above 1,100 feet as shown in Attachment C.

71. Based on data from the ALRRF weather station from 1997 [Simon, 1998], the prevailing wind for the site is west-southwest for 50% of the time with an additional 10% to the west, 7% to the southwest, and 6% to the north. The mean annual wind speed in 1997 was 12.6 miles per hour (mph), with June being the windiest month.

72. For Class III landfills, Fill Area 1 Unit 1 WMU, the 100-year, 24-hour precipitation event for the facility is estimated to be 3.75 inches, based on Department of Water Resources' bulletin 195 entitled *Rainfall Depth-Duration-Frequency for California*, revised November 1982, and updated August 1986. More recent data published by the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 6, Version 2 predicts the 100-year, 24-hour precipitation event for the facility to be 4.44 inches with a 90% confidence interval ranging from 3.65 to 5.52 inches. The Discharger is required to design their LCRS, precipitation, and drainage control facilities using design storm information that is the most current and protective per Title 27 sections 20340 and 20365.

73. For Class II landfills, Fill Area 1 Unit 2 WMU and Fill Area 2 WMU, the 1,000-year, 24-hour precipitation event for the facility is estimated to be 4.9 inches, based on Department of Water Resources' bulletin 195 entitled *Rainfall Depth-Duration-Frequency for California*, revised November 1982, and updated August 1986. More recent data published by the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 6, Version 2 predicts the 1000-year, 24-hour precipitation event for the facility to be 6.48 inches with a 90% confidence interval ranging from 4.85 to 8.82 inches. The Discharger is required to design their leachate, precipitation, and drainage control facilities using design storm information that is the most current and protective per Title 27 sections 20340 and 20365[1].

74. The waste management facility is not within a 100-year flood plain based on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, Community-Panel Number 060001-0140A (effective map date 3 August 2009).

SURFACE WATER CONDITIONS

75. The Water Quality Control Plan for Sacramento and San Joaquin River Basins, Fourth Edition (hereinafter "Basin Plan"), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.

76. The facility is near the crest of the Altamont Hills. The regional topography is characterized by moderately to steeply rolling hills and narrow valleys that have a northwest trend. Surface water flows from the ridges down through the valleys and discharges into local drainages. These natural drainages, which are often dry, ultimately drain toward the Sacramento-San Joaquin Delta to the east or the San Francisco Bay toward the west, when surface water flow is sufficient. The drainage divide between the Central Valley Region and San Francisco Bay Region traverses the facility property.

77. Runoff originating on the east side of the facility property drains eastward in un-named channels and ditches to Mountain House Creek, which flows to Old River in the

[1] Based on the latest publication by NOAA [2013], the design storms are 4.44 in. and 6.48 in. for the 100- yr, 24-hr and 1,000-yr, 24-hr storms, respectively the Discharger designed FA2 Phase 1 storm water management system (SWMS) using the NOAA 14 design storm events.

Sacramento-San Joaquin Delta. Runoff originating on the west side of the divide flows west-southwest to channels along Dyer Road that drain into Altamont Creek, which may flow into San Francisco Bay through Arroyo Las Positas, Arroyo Mocho, Arroyo de la Laguna, and Alameda Creek near Union City.

78. For the drainages on the east side of the surface water divide, which drain into Sacramento-San Joaquin Delta, designated beneficial uses of surface waters, as designated in the Basin Plan, are: municipal and domestic supply; agricultural supply; industrial service supply; industrial process supply; water contact and non-contact water recreation; warm freshwater habitat; cold fresh water habitat; migration of aquatic organisms; spawning, reproduction, and/or early development; wildlife habitat; and navigation.

79. For the drainages on the west side of the surface water divide, as designated in the Water Quality Control Plan for the San Francisco Bay Basin, the Arroyo de la Laguna has potential beneficial uses for warm freshwater habitat and cold freshwater habitat, and existing beneficial uses for groundwater recharge, fish migration, water contact recreation, non-contact water recreation, fish spawning, and wildlife habitat.

80. Storm water sedimentation basins A, B, C, SB-1, SB-2, and SB-A are located around the landfill as shown on Attachment E. The basins detain storm water for sedimentation control during the rainy season. When storm water flows are sufficient, storm water from the sedimentation basins discharge to the San Joaquin River to the east and to the San Francisco Bay toward the west.

81. The U.S. Army Corps of Engineers (USACE) is responsible for the issuance of permits for the placement of dredged or fill material into waters of the United States (waters) pursuant to Section 404 of the Clean Water Act (CWA) (33 USC 1344). A delineation of jurisdictional waters and wetlands at the ALRRF site was initially completed by LSA Associates, Inc. (LSA) on 18 January 1993, and verified by USACE on 7 April 1993. The delineation determined that no wetlands exist within the proposed footprint of Fill Area 2, thus Part 258.12 of Subtitle D requirements are not applicable to the proposed Fill Area 2. However, during the development of Fill Area 2, approximately 0.5 acres of channels/watercourses would be filled. To address the 0.5 acres of ephemeral watercourses to be impacted by Fill Area 2 development, the Discharger applied to the USACE for an Individual Army Permit on 24 May 2004. A conceptual waters mitigation plan was submitted to the USACE, which entailed a combination of channel restoration and pond/wetland creation and/or enhancement to achieve a 3:1 replacement-to-loss ratio. The USACE requested a specific plan, which the Discharger submitted on 19 September 2005 and final approval was given in August 2011. Additionally, the Discharger submitted a permit application to the Central Valley Water Board for a Section 401 Water Quality Certification on 24 May 2004. The Central Valley Water Board issued a Technically Conditioned Certification on 27 July 2004, and the application was approved in December 2010. Section 401 and Section 404 permits were not required at the time that Fill Area 1 was permitted.

GROUNDWATER CONDITIONS

82. The Diablo Range forms a surface water and groundwater divide between the San Joaquin Valley Basin to the east and the Livermore Valley Basin to the west.

83. In general, groundwater movement in the vicinity of the site is influenced by the local topography along each side of the groundwater divide. Groundwater is recharged mainly by direct infiltration of precipitation into alluvial deposits and weathered bedrock. During the dry months of May through October, discharge likely occurs through evapotranspiration from the shallow soil, with little or no observable storm-water flow. During the wetter months of November through April, groundwater discharge can locally exceed the evapotranspiration potential, resulting in springs and local, intermittent surface flow. Water levels vary seasonally in response to precipitation patterns.

84. Shallow groundwater is encountered at the site at depths ranging from approximately 140 ft bgs [RUST, 1994a] on hilltops to as little as 13 ft bgs in the valley bottoms (e.g., Harding ESE, 2001). Groundwater occurs primarily in the upper weathered portions of the Panoche Formation bedrock and in the valley alluvium. .

85. Vertical hydraulic gradients show a very consistent pattern, with downward gradients measured along the ridges (recharge areas) and upward gradients in the valleys (discharge areas). The magnitudes of vertical hydraulic gradients are generally in the range of 0.1 to 0.6 ft/ft. The maximum downward gradient is 1.31 ft/ft between groundwater monitoring wells E-20B and MW-3B, and the maximum upward gradient is 0.20 ft/ft between groundwater monitoring wells PC-2A and PC-2C.

86. Based on a conceptual hydrogeologic model developed for the site, groundwater migration in the vicinity of Fill Area 1 and Fill Area 2 is primarily controlled by the site topography. The site's steep grade and high relief are capable of generating large hydraulic gradients within groundwater, and thus potentially rendering local variations in geology of only secondary consequence. The Discharger states the following in regards to communication to deep zones: "Hydraulic testing conducted during the 2002 hydrogeologic investigation (LFR, 2002) concluded from three pumping and recovery tests that no measurable hydraulic communication exists between shallow and deeper groundwater zones. The contribution of local groundwater flow to Livermore-Amador Valley's main groundwater basin is considered negligible due to the very low permeability of the geologic materials (Alameda County Water District Zone 7, 2001). Rather, local groundwater flow that does occur, discharges as surface water into valley bottoms (Alameda County Water District Zone 7, 2001)."

87. In general, measured hydraulic conductivity has been observed to decrease with depth in the Panoche Formation beneath the site (Woodward-Clyde, 1975; Golder, 1993; Rust, 1994; LFR, 2001; LFR, 2002). The highest hydraulic conductivity values have been observed in the shallowest depth intervals (i.e., 4.3×10^{-2} centimeters per second [cm/sec] at OW-6, which is screened from 9.5 to 14.5 feet bgs). The more transmissive zones are associated with colluvium/alluvium and the upper, more pervasively

weathered portions of the underlying bedrock. Significantly lower hydraulic conductivity values (as low as 1.5×10^{-9} cm/sec at MW-5) have been measured at depths greater than 150 feet bgs. Results of slug testing of wells and piezometers screened across sandstone intervals also indicated permeabilities in the range of 10^{-3} to 10^{-7} cm/sec dependent on the degree of fracturing, induration and cementation of the sandstone unit (LFR, 2001; LFR, 2002; Rust, 1994). As reported in the Discharger's latest Semi-Annual Groundwater MRP (SCS, 2015a), the horizontal groundwater flow velocity in the alluvium and weathered bedrock is estimated to be approximately 1.4 feet/day.

88. In the vicinity of the ALRRF, the water table is typically encountered in the weathered bedrock or the colluvium/alluvium. The weathered bedrock generally consists of highly fractured claystone, siltstone, and sandstone, and the colluvium/alluvium is a relatively well-graded mixture of sand, silt and gravel. Although the pore sizes in the weathered claystone and siltstone are generally small, the degree of fracturing creates the opportunity for irregularly distributed large pore spaces in the matrix. Within the colluvium/alluvium, there is significant heterogeneity resulting in a variety of pore sizes. Fracture spacing in the weathered bedrock and layered heterogeneities in the colluvium/alluvium are both on the scale of one foot or less. Therefore, the height of the capillary fringe above static groundwater levels is expected to be of a corresponding scale of one (1) foot or less.

89. Groundwater within the Panoche Formation generally has high concentrations of most ions, particularly sodium and chloride [WCC, 1975; EMCON, 1987]. The high chloride concentrations have been attributed to a combination of connate water from the Jurassic- Cretaceous marine sediments and infiltration of surface water high in chloride concentrations due to evaporation [RUST, 1994a].

90. Total Dissolved Solids (TDS) is a measure of the total concentration of dissolved inorganic constituents in water. The results of the anion and cation analyses of groundwater samples collected during the site characterization investigation performed by Rust in August and February of 1993 showed TDS concentrations range from very low to brackish conditions (Rust, 1994). More recent studies indicate the TDS content of groundwater generally increases with depth (LFR, 2001). These investigations indicate TDS values increase with depth in the formation to maximum observed values of up to approximately 3,000 mg/L. Deeper groundwater is characterized as having TDS concentrations greater than 1,000 mg/L (LFR, 2001). The increasing TDS with depth indicates that deeper groundwater has a longer contact time with the formation than shallower groundwater, consistent with the hydraulic conductivity values, which decrease with depth. Groundwater geochemistry is primarily sodium bicarbonate to sodium chloride dominated.

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

GROUNDWATER MONITORING

92. In June 1998, the Discharger submitted to the Central Valley Water Board staff a proposed Detection Monitoring Program (DMP) that covered Fill Area 1 and a previously proposed Expansion Area (Rust, 1998b). In response to Central Valley Water Board staff concerns over the adequacy of the proposed monitoring network for Fill Area 1, the Discharger initiated further hydrogeologic investigations, including the installation of 13 additional monitoring wells. Since 1999, the Discharger has further characterized the hydrogeologic conditions at the perimeter of Fill Area 1. Those investigations have been thoroughly described in previous reports (e.g., Levine-Fricke, 2001; Levine-Fricke, 2002) and the results have been incorporated into the design of the Discharger's Monitoring and Reporting Program. Fill Area 1 is currently monitored in accordance with the requirements of WDRs Order R5-2009-0055, adopted by the Central Valley Water Board on 24 April 2009**.** These WDRs require Fill Area 1 and Fill Area 2 groundwater quality to be monitored in accordance with the requirements of these WDRs and MRP.

93. The Discharger's conceptual groundwater model for Fill Area 1 and Fill Area 2 suggests that the majority of the groundwater flow follows the original topography as it passes the facility boundary. Fracturing in the upper weathered zone controls vertical groundwater flow. The DMP should be designed, installed, sampled and maintained to assure the earliest possible moment of a release.

    Current groundwater monitoring wells for Fill Area 1 are listed here and also in Section A.1 of MRP R5-2016-0042. Locations of monitoring wells are shown on Attachment D. Current groundwater monitoring points for Fill Area 1 are:

Fill Area 1- Current Groundwater Monitoring

Well No.	Monitoring Program	WMU/Phase	Stratigraphic Zone[2]
MW-2A	Detection Monitoring	Unit 1 (U1) and Unit 2 (U2)	W
MW-4A	Detection Monitoring	U2	W
MW-5A[3]	Detection Monitoring	U1	W
MW-6	Detection Monitoring	U2	W/U
MW-7	Detection Monitoring	U1	W/U
MW-11[4]	Detection Monitoring	U1	W
E-03A	Corrective Action	U1	W
E-05	Corrective Action	U1	A
E-07	Corrective Action	U1	W
E-17	Corrective Action	U1	W/U
E-20B	Corrective Action	U1	U

[2] A= alluvium, W= weathered bedrock, U = Unweathered bedrock

[3] MW-5A is also a detection monitoring point for the future FA1 surface impoundment.

[4] MW-11 is also a detection monitoring point for the future FA1 surface impoundment.

Fill Area 1- Current Groundwater Monitoring

Well No.	Monitoring Program	WMU/Phase	Stratigraphic Zone[2]
E-23	Corrective Action	U1	W/U
MW-12	Corrective Action	U1	W
PC-1B	Corrective Action	U1	U
PC-1C	Corrective Action	U1	W/U

Groundwater monitoring wells E-20B, E-07, and E-05 associated with Fill Area 1 Unit 1 continue to indicate that a release of VOCs has occurred. These WDRs require the Discharger to perform corrective action for the release of VOCs from Fill Area 1.

94. Current groundwater monitoring system for Fill Area 2 is listed in Section A.1 of MRP R5-2016-0042. Locations of monitoring wells are shown on Attachment D. Current groundwater monitoring points for Fill Area 2 are:

Fill Area 2- Current Groundwater Monitoring

Well No.	Monitoring Program	WMU/Phase	Stratigraphic Zone
MW-4A	Detection Monitoring	U1	W
MW-8A	Detection Monitoring	U1	A
MW-8B	Detection Monitoring	U1	W
MW-9	Detection Monitoring	U1 Phase 7-9	W
MW-10	Background	U1	W
MW-13A	Detection Monitoring	U1 Phase 3	A
MW-13B	Detection Monitoring	U1 Phase 3	W
MW-14	Detection Monitoring	U1 Phase 1	W
PC-1A	Detection Monitoring	U1	W
PC-1C	Detection Monitoring	U1	W/U

The Discharger also proposes to install additional monitoring wells to monitor future construction phases of Fill Area 2 Unit 1, as shown on Attachment D.

95. In addition to measuring water levels in the proposed wells that comprise the Detection Monitoring Program (DMP), Corrective Action Program (CAP), and upgradient monitoring program, the Discharger monitors water levels at additional monitoring wells and piezometers listed in Section A.1 of MRP R5-2016-0042 and shown on Attachment D. The Discharger uses the water level information for long-term monitoring of the potentiometric surface and vertical hydraulic gradients.

96. The Dischargers existing detection monitoring program (DMP) for groundwater at both Fill Area 1 and 2 needs to be further evaluated to ensure compliance with Title 27 section 20415(b)(1)(B). Specifically, there are areas in Fill Area 2 where insufficient

data are available to effectively generate groundwater elevation contour maps due to fact that some wells have gone dry. In addition, the spacing of wells in both the main canyons of Fill Area 1 and 2 may not be sufficient to provide effective detection monitoring. The Discharger also needs to further evaluate the need for monitoring wells along a canyon oriented southeast around groundwater monitoring well E-20B. Lastly, the Discharger needs to evaluate the potential effects that storm water basins may have on the ability to collect representative groundwater samples from wells located in close proximity to the basins. These WDRs in Provision H.8 require the Discharger to submit a workplan to address these items in order to ensure compliance with Title 27 section 20415.

GROUNDWATER MONITORING FOR SURFACE IMPOUNDMENTS

97. As stated in in the Previous Enforcement section above, the Discharger constructed an 8 million gallon surface impoundment and leachate conveyance system for handling liquid designated waste from Fill Area 2 Unit 1 Phase 1 and subsequent future phases. The Discharger proposes to construct two new Class II surface impoundments (currently sized at 4.6 and 4.8 million gallons each) for handling liquid designated waste from Fill Area 1. The Discharger shall establish WQPS's before using these impoundments.

98. The Discharger must comply with Title 27 section 20415(e)(6) which requires the Discharger to establish background values of groundwater quality for a period of one year, including times of expected highest and lowest annual elevations of the groundwater surface prior discharging waste to the Units. As of the date of these WDRs, the Discharger has not completed their groundwater detection monitoring system for the 8-million gallon Class II surface impoundment.

99. These WDRs in Provisions H.8 require the Discharger to submit a workplan to complete their groundwater detection monitoring network and establish background groundwater quality for each Class II surface impoundment that complies with Title 27 section 20415 before using these impoundments.

UNSATURATED ZONE MONITORING

100. Title 27 section 20164 defines the "containment structure" of a Unit as "an artificial feature designed and installed to contain waste constituents, including waste constituents mobilized as a component of leachate or of landfill gas." Title 27 section 20415(d) requires that the Discharger monitor the unsaturated zone to provide the best assurance of the earliest possible detection of a release from the Unit.

101. The Discharger's current unsaturated zone monitoring system for Fill Area1 Unit 1 includes; the valley underdrain collection sump (VD); and for Fill Area 1 Unit 2, the valley underdrain collection sump (VD2) and the underlying pan lysimeter (VZM-A).

102. Shown below is a summary of VOCs detected at 50 percent of the time or more in liquids in the unsaturated zone monitoring of Fill Area 1 Unit 1 which includes monitoring of the valley underdrain collection sump (VD):

Fill Area 1 Unit 1 (VD)	Year										
Constituent of Concern	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	% Detected
1,2-Dichlorobenzene	●	●	●	●	●	●	●	●	●	●	100%
1,4-Dichlorobenzene	●	●	●	●	●	●	●	●	●	●	100%
Benzene	●	●	●	●	●	●	●	●	●	●	100%
Chlorobenzene	●	●	●	●	●	●	●	●	●	●	100%
Diethyl ether	●	●	●	●	●	●	●	●	●	●	100%
Tetrahydrofuran	●	●	●	●	●	●	●			●	80%
tert-Butyl alcohol (TBA)				●	●	●	●	●		●	60%
Methyl-tert-butyl ether (MTBE)				●	●	●	●			●	50%
Xylenes		●		●	●			●		●	50%

Note that percentages may include detections that were re-sampled and may not be representative.

103. Shown below is a summary of VOCs detected 50 percent of the time or more in liquids in the unsaturated zone monitoring of Fill Area 1 Unit 2 which includes monitoring of the valley underdrain collection sump (VD2):

Fill Area 1 Unit 2 (VD2)	Year									
Constituent of Concern	2006	2007	2008	2009	2010	2011	2012	2013	2014	% Detected
Acetone	●	●	●	●	●	●		●	●	89%
Ethylbenzene	●	●	●	●	●	●	●		●	89%
Toluene	●	●	●	●	●	●	●		●	89%
Xylenes	●	●	●	●	●	●	●		●	89%
1,4-Dichlorobenzene		●	●	●	●	●	●		●	78%
Naphthalene	●	●	●	●		●	●		●	78%
Tetrahydrofuran	●	●	●	●		●	●		●	78%
2-Butanone	●	●		●		●		●	●	67%
Chlorobenzene		●	●	●	●	●			●	67%
cis-1,2-Dichloroethene	●	●	●	●	●				●	67%
Diethyl ether	●	●	●	●	●				●	67%
tert-Butyl alcohol (TBA)				●	●	●	●	●	●	67%
Benzene	●	●	●	●					●	56%

Note that percentages may include detections that were re-sampled and may not be representative.

Shown below is a summary of VOCs detected 50 percent of the time or more in liquids in the pan lysimeter (VZM-A) below the Fill Area 1 Unit 2 LCRS sump which monitors the unsaturated zone below the WMU:

Fill Area 1 Unit 2 (VZM-A)	Year									
Constituent of Concern	2006	2007	2008	2009	2010	2011	2012	2013	2014	% Detected
1,4-Dichlorobenzene	●	●	●	●	●	●	●	●		89%
Acetone	●	●	●	●	●	●	●	●		89%
Benzene	●	●	●	●	●	●	●	●		89%
cis-1,2-Dichloroethene	●	●	●	●	●	●	●	●		89%
Ethylbenzene	●	●	●	●	●	●	●	●		89%
Tetrahydrofuran	●	●	●	●	●	●	●		●	89%
Toluene	●	●	●	●	●	●	●	●		89%
Xylenes	●	●	●	●	●	●	●	●		89%
1,2-Dichlorobenzene	●	●	●		●	●	●	●		78%
Chlorobenzene	●	●	●	●	●	●	●			78%
Diethyl ether	●	●	●	●	●		●	●		78%
2-Butanone		●	●		●	●	●	●		67%
tert-Butyl alcohol (TBA)				●	●	●	●	●	●	67%
Dichloromethane	●	●	●	●		●				56%
Methyl-tert-butyl ether (MTBE)				●	●	●	●	●		56%
Naphthalene	●		●			●	●	●		56%

Note that percentages may include detections that were re-sampled and may not be representative.

104. Title 27 requires that waste containment structures "*contain waste constituents, including waste constituents mobilized as a component of leachate or of landfill gas*." In Fill Area 1 Unit 1 and Fill Area 1 Unit 2 the Discharger has continued to report the detection of VOCs such as but not limited to 1,4-dichlorobenzene, diethyl ether, and xylenes in the valley underdrains VD and VD2 respectively. The Discharger has also reported VOCs in groundwater point of compliance monitoring wells E-05, E-07, and E-20B associated with Fill Area 1 Unit 1. The Discharger has attributed the VOCs to landfill gas releases from Fill Area 1 and has proposed installation of additional landfill gas extraction wells as corrective action. In order to demonstrate that the Discharger's corrective action for controlling releases of VOCs due to gas migration is effective these WDRs in Provisions H.8 require the Discharger to submit a work plan and updated sample collection and analysis plan for installation of soil-pore gas monitoring devices in the unsaturated zone at the edge of waste for Fill Area 1 Unit 1 in the vicinity of point of compliance monitoring wells E-05 and E-20B and in Fill Area 1 Unit 2 in the vicinity at the edge of waste closest to the underdrain collection sump (VD2) and underlying pan lysimeter (VZM-A). Monitoring and Reporting Program No R5-2016-0042 also requires the Discharger monitor perimeter gas probes along the southern edge of the Facility and other probes where landfill gas has been reported.

105. The Discharger in its 2015 First Semiannual MRP report stated that "Previous studies identified LFG as the source of VOC detections at VZM-A and VD2 (Geomatrix, 2001), and this is likely also the case for VD. To reduce the influence of LFG as these locations, ALRRF has been extracting LFG from VD2, LS2, and VZM-A piping systems. Liquids that are captured in the VZM-A, VD, and VD2 containment systems are handled (e.g., collected and disposed) in the same way as leachate." These WDRs and MRP require the Discharger to monitor and report landfill gas removed from VD2 and LS2 piping systems and manage liquids originating from outside the WMUs (e.g., liquids captured in underdrains VD and VD2) differently from liquids originating inside the WMUs (such as leachate, landfill gas condensate, and liquids captured in any pan lysimeter used to monitor the unsaturated zone beneath a WMU).

106. The Discharger also proposes to monitor the unsaturated zone below the 8 million gallon class II surface impoundment using a pan lysimeter (VZM-B) as shown in Attachment E. The Discharger also proposes to monitor the unsaturated zone beneath Fill Area 2 Unit 1 with a pan lysimeter that will be constructed below the future Fill Area 2 Unit 1 LCRS sump. However, the construction of the LCRS sump and this pan lysimeter will not occur until the Discharger completes construction of several future phases of waste disposal in Fill Area 2 Unit 1 as shown in Attachment E. The Discharger's projection of construction of these future phases is years away and therefore currently proposed monitoring of Fill Area 1 Unit 1 does not satisfy Title 27 requirements of unsaturated zone monitoring.

107. The Discharger has also constructed a leak detection system below the containment structure of Fill Area 2 Unit 1 Phase 1. However, monitoring of this leak detection system was not included as part of the Discharger's unsaturated zone monitoring system. These WDRs in Provisions H.8 require the Discharger to submit a work plan and updated sample collection and analysis plan for monitoring the unsaturated zone associated with each phase of construction for Fill Area 2 Unit 1 which will include but not limited to:

    a. Monitoring and reporting of liquid collected in the underdrains associated with each phase of construction in Fill Area 2 Unit 1. The liquid shall be collected as close to edge of waste as possible in order to provide representative samples;
    b. Monitoring and reporting of liquid collected in the leak detection system associated with each phase of construction in Fill Area 2 Unit 1. The liquid shall be collected as close to edge of waste as possible in order to provide representative samples; and
    c. Submit a workplan to perform gas monitoring and reporting in the unsaturated zone for each phase of construction in Fill Area 2 where a pan lysimeter will not be constructed to serve as a proxy until installation of a pan lysimeter below the final LCRS sump for Fill Area 2 Unit 1. The Discharger does not plan to construct pan lysimeters under each temporary LCRS collection point constructed for each phase of construction in Fill Area 2. Where the Discharger does not construct a LCRS sump and underlying pan lysimeter for any phase of construction, the workplan will include installation of soil-pore gas monitoring devices at the edge of that phase of

construction of Fill Area 2 closest to the LCRS collection point to determine if gas containing VOCs is being released from that phase of the Unit.

SURFACE WATER MONITORING

108. The Discharger is required to monitor surface water discharges associated with storm water drainage from the Facility. The Discharger is not permitted to discharge to surface waters from the Facility except under its Industrial Activities Storm Water General Permit requirements, which comply with the State's National Pollutant Discharge Elimination System (NPDES) requirements administered under the State Water Resources Control Board Industrial General Permit (IGP) Order No. 2014-0057-DWQ. These WDRs require the Discharger to monitor its storm water detention basins to ensure that storm water at the Facility is either diverted away from the WMUs or storm water that contacts waste is properly contained and disposed of or reused. These WDRs require the Discharger to monitor storm water exiting sedimentation basins A, B, C, SB-A, SB-1, and SB-2 in conjunction with the Discharger's notice of intent to comply with IGP Order No. 2014-0057-DWQ which was filed on 1 July 2015.

109. A summary of the Discharger's surface water monitoring is shown in the table below (data source: Geotracker). The table shows the number of detections for storm water detention basins per year. The data indicates that runoff from the Facility to storm water basins contains multiple COCs such as 2-butanone (MEK), 4-methyl-2-pentanone (MIBK), acetone, and n-hexane extractable material. These WDRs in Provisions H.8 require the Discharger to submit a work plan and technical report to determine the source of COCs discharged to surface waters and provide preventive measures to eliminate such discharges.

	2009			**2010**			**2011**			**2012**			**2013**			**2014**		
	Basin			**Basin**			**Basin**			**Basin**			**Basin**			**Basin**		
	A	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**
# COC Detections per basin	7	6	7	0	6	5	4	0	14	5	12	9	Did not sample			1	1	8
Total # of COC Detections per year	**20**			**11**			**18**			**26**						**10**		

In addition to storm-water runoff, natural groundwater seepage contributes to the discharge from the Altamont Hills. The locations of groundwater seeps in the vicinity of the ALRRF are shown on Attachment G. These seeps were identified on the National Wetlands Inventory "Altamont" and "Byron Hot Springs" maps prepared by U.S. Department of Interior in 1987, and in the RUST Environment & Infrastructure, Inc. *Class II Expansion Area Site Characterization Report, Altamont Landfill and Resource Recovery Facility* (RUST report [1994a]). Groundwater seepage is common in the region as evidenced by areas of standing water in the valley bottoms that remains into the dry season. These WDRs require the Discharger in Provisions H.8 to prepare an

updated technical report identifying all groundwater seeps/springs within one mile of the drainage basins downgradient of Fill Area 1 and Fill Area 2 where groundwater potentially originated and/or flowed below a WMU and may have expressed itself as a seep/spring.

LEACHATE MONITORING

110. Leachate produced within Fill Area 1 is monitored at locations designated as LS, LS2, and Wastewater Plant Effluent. The estimate annual quantity of leachate collected from unlined Fill Area 1 Unit 1 and lined Fill Area 1 Unit 2 are shown below:

	Fill Area 1 Estimated Leachate Volumes (Million Gallons)									
Monitoring Point(s)	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Unit 1 LCRS (LS) & Valley Drain (VD)	1.217	1.900	1.118	1.204	0.838	1.002	1.399	1.535	2.174	2.065
Unit 2 LCRS (LS-2)	2.558	1.384	1.850	1.808	2.165	1.773	1.980	1.865	1.858	2.743

Currently the Discharger is combining leachate collected in Fill Area 1 Unit 1 (LS) with underdrain flows collected in the Fill Area 1 Unit 1 valley underdrain (VD). These WDRs require the Discharger in Provisions H.8 to manage flows from the underdrains such that the direct discharge of liquids originating from outside a WMU into a solid waste WMU for waste disposal purposes does not occur.

111. The results for leachate monitoring reported in Annual Reports from 2001 through 2015 for unlined Fill Area 1 Unit 1, at Point LS are provided below:

		Sample Location LS (Fill Area 1, Unit 1 LCRS)															
Sample Date		1/15/01	1/8/02	2/26/03	2/27/04	2/16/05	9/8/05	3/9/06	2/9/07	3/7/08	3/4/10	3/2/11	12/1/11	12/5/12	12/16/13	12/5/14	12/1/15
FIELD PARAMETERS	**pH (pH units)**	6.67	7.16	7.05	6.60	7.14	6.51	6.83	7.86	6.76	7.03	6.37	6.45	6.40	6.84	6.78	7.63
	Turbidity (NTU)	6.18	23.2	454.0	20.4	---	10.1	13.4	177	157	14	9.50	0.0	332.8	208	108	54.2
	Temperature (Celsius)	30.7	22.3	26.3	26.2	27.0	30.7	28.6	24.0	23.3	28.2	23.8	27.8	29.8	30.6	30.9	31.3
	Specific Conductance (µmhos/cm)	2,930	3,359	2,660	10,000	6.0	100	2,450	3,090	19,800	4,300	3,850	4,020	4,580	4,020	4,680	5,150
GENERAL CHEMISTRY (mg/L)	**Total Dissolved Solids**	1,600	6,720Q	1,600	1,600C	1,500	1,800	1,700	2,000G	1,100	1,900	1,800	1,900	2,000	2,000	2,300	2,600
	Carbonate Alkalinity	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Bicarbonate Alkalinity	896	2,170	920	920	910	880	950	880	900	1,100	1,000	970C	1,000	1,000	1,200	1,400C
	Chloride	392Q	749Q	390Q	380Q	350Q	490CQ	480Q	550Q	320Q	570	620	630	640	660C	750	860
	Sulfate	34.2	2,380Q	40	19	4.8AC	28	19C	34CG	47Q	19	19	14	7.7	7.3	3.9A	6.1
	Nitrate as Nitrogen	<0.1	0.32	<0.1	<0.1	0.21	<0.1	0.12	<0.2G	0.43	<0.1	<0.1	<0.1	0.085A	<0.1	<0.1	0.33C
	Calcium (dissolved)	131	78.2	140	150C	150	170	140	150C	190C	170	170	160	160	140	150	150
	Magnesium (dissolved)	105	869	120	120	110	130	120	110	100C	130	130	120	130	130	140	150
	Potassium (dissolved)	7.26	47.5	7.4	8.8	8.8	9.8C	12	12	10	23	18	13	25	22	50	80
	Sodium (dissolved)	276	753	290	290	290	350	320	350	310C	400	410C	440C	440C	390	500	560C
VOLATILE ORGANIC COMPOUNDS ((µg/l)	**Acetone**	<34	460	3.8AC	2.7A	<34	7.5A	<68	2.3A	5.0A	12A	<34	2.8A	<10	3.0A	2.8AX	9.6AT
	Benzene	1.9A	4.5A	2.0A	3.0A	1.7A	1.9A	2.0A	1.2A	1.8A	2.0A	2.4A	2.0	1.9	2.2	2.8	2.7
	2-Butanone (MEK)	<10	980	<10	<10	3.1A	<10	<20	<10	<10	4.9A	<10	<6	<6	<6	<6	<6
	Carbon Disulfide	0.86A	2.2A	<5	<5	0.32A	<5	<10	<5	<5	<5	<5	<2	<2	<2	<2	<2
	Chloroethane	<10	<10	<10	<10	<10	<10	<20	<10	<10	<10	<10	<2	<2	<2	<2	<2
	Chloroform	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<1	<1	<1	<1	<1
	Chlorobenzene	2.8A	<5	2.7A	3.5A	1.8A	2.1A	2.3A	1.4A	2.3A	2.4A	2.5A	2.7	2.3	2.5	3.5	3.0
	1,2-Dichlorobenzene	0.63A	<10	0.67A	0.91A	0.64A	0.96A	0.78A	0.61A	0.76A	0.88A	0.76A	0.93A	0.65A	0.94A	1.1	0.98A
	1,3-Dichlorobenzene	0.69A	<10	0.70A	0.96A	0.58A	1.0A	0.83A	0.57A	0.70A	0.61A	0.65A	0.93A	0.54A	0.58A	0.42A	0.50A
	1,4-Dichlorobenzene	12	4.7A	9.9A	13	7.1A	12	11A	7.7A	12	11	11	15	12	14	13	13
	1,1-Dichloroethane	0.83A	5.8	0.88A	1.0A	0.51A	0.31A	0.34A	<5	0.26A	<5	<5	<1	<1	<1	<1	<1
	1,2-Dichloroethane	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Cis-1,2-Dichloroethene	0.85A	2.7A	1.9A	2.8A	1.7A	0.8A	1.3A	0.7A	2.6A	2.2A	3.3A	2.5	1.7	3.5	2.1	1.7
	1,1-Dichloroethene	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<1	<1	<1	<1	<1
	Dichlorofluoromethane	0.36A	2.1A	0.27A	0.36A	<10	<10	<20	<10	<10	<10	<10	<2	<2	<2	<2	<2
	trans-1,2-Dichloroethene	<10	<10	0.25A	0.29A	<10	0.15A	<20	<10	0.19A	0.18A	0.20A	0.22A	<1	0.15A	<1	<1
	1,2-Dichloropropane	<5	<5	0.23A	0.25A	<5	<5	<10	<5	<5	<5	<5	<1	<1	<1	<1	<1
	Ethylbenzene	<5	5.9	0.96A	1.2A	3.1A	1.1A	0.71A	0.3A	0.25A	0.21A	<5	<1	0.18A	<1	0.47A	0.74A
	Diethyl ether (Ethyl ether)	4.2A	11	3.7A	3.6A	3.0A	3.5A	2.5A	2.6A	3.6A	3.1A	3.4A	2.9	3.0	3.3	3.0	2.4
	2-Hexanone	<10	<10	<10	<10	<10	<10	3.0A	<10	<10	<10	<10	<5	<5	<5	<5	<5
	Methylene chloride	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	0.35AC	<2	<2	<2	<2
	4-Methyl-2-pentanone (MIBK)	<10	28	<10	<10	<10	<10	<20	<10	<10	2.8A	<10	<5	<5	<5	3.4A	<5
	Naphthalene	<10	<10	0.96A	1.1A	1.8A	0.64A	0.51A	0.69A	<10	1.8A	0.97A	0.80A	1.8	1.3	2.0	1.7
	Styrene	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<1	<1	<1	<1	<1
	Tetrahydrofuran	8.5A	150	19	18	22	22	22	27	23	41	30	20	29	33	45	33
	Tetrachloroethene	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<1	<1	<1	<1	<1
	Toluene	<5	11	0.48A	0.54A	1.8A	0.25A	0.47A	0.19A	0.29A	0.72A	0.36A	0.23A	0.91A	0.40A	0.71A	0.49A
	1,2,4-Trichlorobenzene	<5	<5	<5	0.22A	<5	<5	<10	<5	<5	<5	<5	<1	<1	0.26A	<1	0.22A
	Trichloroethene	<5	<5	<5	0.17A	<5	<5	<10	<5	<5	<5	<5	<1	<1	<1	<1	<1
	Vinyl chloride	1.7A	1.2	1.9	2.4	1.1	1.2	0.99A	0.63	1.7	1.9	1.8	2.7	1.4	1.9	0.68	1.1
	Xylenes (total)	<10	8.8A	0.85A	1.1A	4.7A	1.0A	1.3A	<10	<10	0.24A	<10	<2	<2	<2	2.8	4.7
	Tert-Butyl Alcohol	---	---	---	---	---	310	---	---	---	370	250	200	220	230	200	240
	Methyl tert-butyl ether (MTBE)	---	---	---	---	---	0.85A	---	---	---	0.80A	2.6A	0.76A	0.74A	0.89A	0.65A	0.65A

Source: Altamont Landfill 2015 Annual Report, Table 10 –Analytical Results for Leachate Monitoring, Altamont Landfill and Resource Recovery Facility

A. Flag denotes concentration reported is estimated because it is below the reporting limit and above the method detection limit.

C. Flag denotes analyte was also detected in the associated method blank at a reportable limit.

G. Flag denotes elevated reporting limit due to matrix interference.

Q. Flag denotes elevated reporting limit due to high analyte levels.

X. Flag denotes analyte was detected in trip, field, and/or method blank associated with a different lot during the same monitoring event.

T. Flag denotes constituent also found in trip blank.

112. The results for leachate monitoring reported in Annual Reports from 2001 through 2015 for Fill Area 1 Unit 2, at Point LS-2 are provided below:

		Sample Location LS-2 (Fill Area 1, Unit 2 LCRS)																
	Sample Date	1/15/01	1/8/02	2/26/03	2/27/04	2/16/05	9/7/05	3/9/06	2/9/07	6/6/07	2/29/08	11/30/09	11/5/10	12/1/11	12/5/12	12/6/13	12/5/14	12/1/15
FIELD PARAMETERS	pH (pH units)	7.14	7.06	7.85	7.10	7.16	6.76	6.97	7.21	7.36	7.13	7.05	7.21	7.01	7.03	7.10	8.10	8.44
	Turbidity (NTU)	9.67	51.8	50.6	65.8	---	290	5.9	28	39	33	198	30	6.0	0.0	173	500	51
	Temperature (Celsius)	27.7	21.8	26.9	32.9	33.7	36.3	29.5	31.9	33.6	31.3	27.6	32.5	31.2	32.7	31.9	32.1	35.1
	Specific Conductance (µmhos/cm)	13,880	7,474	6,020	8,140	9,480	3,220	3,110	24,200	1,570	18,500	3,110	2,020	12,600	11,500	16,020	17,500	16,100
GENERAL CHEMISTRY (mg/L)	Total Dissolved Solids	11,800Q	6,480Q	3,800	6,500CQ	8,500Q	2,200G	1,900	15,000Q	13,000Q	14,000Q	13,000Q	1,200	12,000	11,000	13,000	13,000	12,000
	Carbonate Alkalinity	702	<5	<5	<5	<5	<5	<5	<5	<5	<20	<5	<5	<5	<5	<5	<5	<5
	Bicarbonate Alkalinity	3,000	2,100	1,800	2,700	3,100G	1,200	1,100	4,800	4,000	3,800Q	3,200	<5	3,300C	2,500	2,500	2,400	2,400C
	Chloride	1,280Q	668Q	270Q	650Q	1,100Q	120CQ	130Q	2,300Q	2,200Q	2,300Q	2,500Q	2,700	2,900	2,900	2,700	3,000	3,200
	Sulfate	4,100Q	2,470Q	1,200Q	2,200Q	3,000CQ	470Q	340CQ	5,000CQ	4,400Q	4,700Q	5,700Q	4.1	3,300	3,000	4,700	4,000	3,600
	Nitrate as Nitrogen	<0.1	<0.1G	<0.2G	<0.5G	<0.5	<0.1	0.15AG	<1.0G	1.2G	0.57ACG	0.67AG	<0.42	<0.21	<0.21	<0.21	<0.21	1.3C
	Calcium (dissolved)	96.6	79.9	55	78C	79	58	44	73C	79C	88	130	110	110	120	130	110	110
	Magnesium (dissolved)	1,820	823	290	940	1,300	52	36	1,700	1,500	1,700	1,700	1,300	1,100	1,000	1,400	1,300	1,100
	Potassium (dissolved)	128	45.8	16	64	100	5.7C	5.7	230	190	210	190	230	200	190	200	210	210
	Sodium (dissolved)	1,170	743	680	590	1,000	670	600	1,900	1,800	2,000C	2,000C	2,100C	2,100C	2,000C	2,000	2,100	2,200C
VOLATILE ORGANIC COMPOUNDS (µg/L)	Acetone	550A	450	74C	1,900	400	13A	<34	200	88	72CT	<68	<34	40	26	40	<10	36T
	Benzene	9.9A	5	2.9A	8.9A	4.4A	1.7A	0.76A	4.3A	3.1A	3.1A	14	1.7A	1.4	1.7	1.3	1.0	0.76A
	2-Butanone (MEK)	2,000	980	220	6,300	1,000	33	7.7A	300	170	140	<20	<10	13	<8	27	<10	<6
	Carbon Disulfide	<100	1.4A	0.34A	<250	<50	<5	<5	<20	1.1A	4.4A	3.1A	<5	<2	<2	<2	<2.3	<2
	Chloroethane	<200	<10	0.30A	<500	<100	0.29A	<10	<40	<10	<10	<20	<10	<2	<2	<2	<2.1	<2
	Chloroform	<100	<5	<5	<250	<50	<5	<5	<20	<5	<5	<10	<5	<1	<1	<2	<1	<1
	Chlorobenzene	<100	<5	1.5A	<250	<50	1.6A	0.97A	<20	0.48A	0.39A	0.53A	<5	0.38A	<1	<1	<1	<1
	1,2-Dichlorobenzene	<200	<10	0.41A	<500	<100	0.5A	0.44A	<40	0.43AX	0.32AC	0.40A	<10	0.47A	<1	<1	<1	<1
	1,3-Dichlorobenzene	<200	<10	<10	<500	<100	<10	<10	<40	<10	<10	<20	<10	<1	<1	<1	<1	<1
	1,4-Dichlorobenzene	<200	6A	5.9A	11A	7.1A	5.9A	5.8A	7.6A	8.1AX	4.5A	6.3A	7.3A	7.1	6.3	5.0	3.6	3.5
	1,1-Dichloroethane	14A	6.7	3.2A	<250	<50	0.92A	0.98A	1.3A	1.1A	0.69A	0.46A	<5	<1	<1	<1	<1.1	<1
	1,2-Dichloroethane	<100	<5	0.98A	<250	<50	<5	<5	1.9A	1.7A	1.2A	<10	<0.52	<0.5	<0.52	<0.52	<0.65	<0.5
	Cis-1,2-Dichloroethene	6.8A	3.3A	6.3A	7.3A	4.3A	5.0A	2.7A	3.6A	2.8A	2.5A	1.8A	1.1A	0.97A	0.94A	0.70A	<1	0.32A
	1,1-Dichloroethene	<100	<5	<5	<250	<50	<5	<5	0.91A	0.35A	<5	<10	<5	<1	<1	<1	<1.2	<1
	Dichlorofluoromethane	4.4A	2.4A	0.65A	<500	<100	<10	<10	4.5A	<10	0.50A	<20	<10	<2	<2	<2	<2	<2
	trans-1,2-Dichloroethene	<200	<10	0.23A	<500	<100	0.15A	<10	<40	<10	<10	<20	<10	<1	<1	<1	<1	<1
	1,2-Dichloropropane	<100	<5	0.35A	<250	<50	0.23A	0.20A	<20	0.33A	0.24A	<10	<5	<1	<1	<1	<1	<1
	Ethylbenzene	15A	6.9	3.5A	21A	13A	2.9A	0.48A	9.9A	7.6	5.9	5.6A	4.0A	4.0	3.2	2.3	1.6	1.1
	Diethyl ether (Ethyl ether)	16A	13	5.3A	<500	3.9A	2.4A	1.5A	3.6A	<10	2.2A	1.7A	1.1A	0.82A	1.2A	<2	<2	0.55A
	2-Hexanone	<200	<10	<10	<500	<100	<10	<10	<40	<10	<10	<20	<10	<5	<6.8	<6.8	<8.5	<5
	Methylene chloride	<100	<5	<5	<250	3.3AC	<5	<5	1.5AX	0.39AC	0.43ACT	<10	<5	0.99AC	<2	<2	<2	<2
	4-Methyl-2-pentanone (MIBK)	<200	27	6.6A	230A	36A	3.6AT	0.98A	9.6A	7.3A	4.9A	<20	<10	<5	<5	<5	<5	<5
	Naphthalene	28AC	<10	1.6A	<500	<100	0.8A	<10	3.9A	5.6AX	4.3A	3.6A	<10	3.9	2.3	3.1	4.9	1.3
	Styrene	<100	<5	<5	<250	<50	<5	<5	<20	0.94A	<5	<10	<5	<1	<1	<1	<1	<1
	Tetrahydrofuran	300	150	50	410A	180	7.0A	1.8A	200	110	76	61	82	82	66	12	48	61
	Tetrachloroethene	<100	<5	0.42A	<250	<50	0.63A	0.41A	<20	0.31A	<5	<10	<5	<1	<1	<1	<1	<1
	Toluene	35A	13	5.4	57A	20A	3.2A	0.41A	14A	6.8	6.6	4.8A	3.5AT	2.9	2.9	2.3	2.4	1.2
	1,2,4-Trichlorobenzene	<100	<5	<5	<250	<50	<5	<5	<20	<5	<5	<10	<5	<1	<1	<1	<1.1	<1
	Trichloroethene	<100	<5	0.91A	<250	<50	0.86A	0.63A	0.95A	0.53A	0.29A	<10	<5	<1	<1	<1	<1	<1
	Vinyl chloride	<200	1.4	1.3	<25	<5	0.84	0.64	1.6A	<0.5	0.49A	<1	<1.6	<0.5	<0.5	<0.5	<0.5	<0.5
	Xylenes (total)	26A	10	5.3A	45A	21A	4.5A	0.82A	17A	10	8.3A	2.0A	8.3AT	4.9	3.6	2.1	1.0A	1.4A
	Tert-Butyl Alcohol	---	---	---	---	---	67	---	---	---	---	1100	1500	1300	1,200	800	920	860
	Methyl tert-butyl ether (MTBE)	---	---	---	---	---	1.4A	---	---	---	---	3.8A	2.2A	1.9A	1.6A	1.2A	<5	0.90A

Source: Altamont Landfill 2015 Annual Report, Table 10 –Analytical Results for Leachate Monitoring, Altamont Landfill and Resource Recovery Facility

A. Flag denotes concentration reported is estimated because it is below the reporting limit and above the method detection limit.

C. Flag denotes analyte was also detected in the associated method blank at a reportable limit.

G. Flag denotes elevated reporting limit due to matrix interference.

Q. Flag denotes elevated reporting limit due to high analyte levels.

T. Flag denotes constituent also found in trip blank

X. Flag denotes analyte was detected in trip, field, and/or method blank associated with a different lot during the same monitoring event.

113. As part of the amended RWD/JTD, the Discharger submitted a December 2008 *Leachate and Condensate Recirculation Plan* requesting approval for returning leachate and landfill gas condensate to units with similar classification and waste characteristics from which they originated to reduce leachate and condensate management costs. Title 27 CCR 20340(g) requires that leachate be returned to the unit of origination (or unit of similar classification) or be discharged in a manner approved by the Central Valley Water Board. This section also references State Water Board Resolution No. 93-62 regarding liquids restrictions in 40CFR 258.28 for MSW landfills, which states that liquid waste may not be placed in MSW landfill units unless the waste is leachate or gas condensate derived from the landfill unit and it is designed with a composite liner and leachate collection system. Therefore, leachate and landfill gas condensate from composite lined units at the landfill may be returned to the unit from which they came or units of the same classification (Class II in this case). This Order includes requirements for returning leachate and landfill gas condensate back to the units in such a way that it is not exposed to surface water runoff, will not cause instability of the landfill, will not seep from the edges of the units.

LANDFILL GAS MONITORING

114. The facility has installed vertical and horizontal landfill gas collection wells and piping into the waste in Fill Area 1, Unit1 and Unit 2. The collection system utilizes high density polyethylene (HDPE) collection pipe and Schedule 80 PVC or steel riser pipe for wells. As the landfill expands, new wells and collection piping is brought online. Landfill gas collected from the system is collected and drawn to the landfill gas-to-energy facility, which consumes an average of 3.6 million cubic feet of landfill gases per day. The existing landfill gas collection system for Fill Area 1 and proposed landfill gas collection system for Fill Area 2 is shown in Attachment F.

115. Landfill gas condensate generated within Fill Area 1 is collected and either gravity flows or is pumped through the lateral and header pipes to a storage tank located at the former landfill gas flare station. The condensate is then removed from the storage tank for destruction in the landfill flare(s) or returned to Unit 2. Alternatively, if the Discharger restarts the WWTP, the Discharger may separate the aqueous phase from the landfill gas condensate for processing in the WWTP. The Discharger historically has injected the following volumes of gas condensate collected from Fill Area 1 into Fill Area 1 Unit 2.

Landfill Gas Condensate Injected into Fill Area 1 Unit 2 (Million Gallons)					
Year	**2010**	**2011**	**2012**	**2013**	**2014**
Volume	1.122	2.599	2.588	2.605	2.325

116. There are 26 landfill gas monitoring probes around the Facility as shown in Attachment F. Typically landfill gas monitoring falls under the jurisdiction of CalRecycle unless the Discharger has determined that landfill gas is the cause of the release of VOCs from a

WMU to receiving waters. Under those conditions the Central Valley Water Board in accordance with Title 27 section 20425 can require the Discharger to perform landfill gas monitoring in order to determine the effectiveness of the Discharger's corrective action program. Due to continued detection of VOCs in groundwater and the underdrain associated with Fill Area 1, these WDRs require the Discharger to install a gas monitoring system in close vicinity to where VOCs have been detected and perform additional gas monitoring in perimeter probes. These WDRs also require the Discharger to perform gas monitoring in the unsaturated zone for each phase of construction in Fill Area 2 as a proxy for final installation of a pan lysimeter below the final LCRS sump since the Discharger does not plan to construct pan lysimeters under each temporary LCRS sump constructed for each phase in Fill Area 2.

GROUNDWATER DEGRADATION AND CORRECTIVE ACTION

117. Locations of groundwater monitoring wells are shown on Figure F. The downgradient edge of Fill Area 1 Unit 1 has historically been impacted by VOCs. Currently, groundwater monitoring wells in corrective action are:

Fill Area 1- Corrective Action Monitoring

Well No.	Monitoring Program	WMU/Phase	Stratigraphic Zone[1]
E-03A	Corrective Action	U1	W
E-05	Corrective Action	U1	A
E-07	Corrective Action	U1	W
E-17	Corrective Action	U1	W/U
E-20B	Corrective Action	U1	U
E-23	Corrective Action	U1	W/U
MW-12	Corrective Action	U1	W
PC-1B	Corrective Action	U1	U
PC-1C	Corrective Action	U1	W/U

[1] A= alluvium, W= weathered bedrock, U = unweathered bedrock

118. Low concentrations of VOCs were detected in groundwater below the Fill Area 1, Unit 1 landfill toe in 1982. Monitoring wells E-05 and E-07 were installed near the toe in 1985 to assist in the monitoring. A groundwater interceptor barrier (GWIB) was installed in 1987 to contain and extract groundwater in the toe area. The toe area of the landfill was closed with a prescriptive cover liner system, and landfill gas collection and control were implemented as corrective actions. The VOCs reported during the initial operation of the GWIB have not been detected above reporting limits since 1992 (SCS Engineers, July, 2003). A detailed evaluation and pilot study program was conducted in 2003 and 2004 to assess the effectiveness of the GWIB. The results of the study indicated that extraction from the GWIB had no consequential effect on groundwater quality at the site, and groundwater extraction from the GWIB, therefore, was terminated in 2004. Based on review of the data, a Revised Engineering Feasibility Study was submitted in 2005,

which included continued landfill gas extraction coupled with monitored natural attenuation as the appropriate remedial action. Groundwater monitoring continues in this area. These WDRs adopt the corrective action measures for this area as described in the 2005 Revised Engineering Feasibility Study. Monitoring wells E-05 and E-07 are currently the Point of Compliance wells in this area.

119. Low concentrations of VOCs were detected on the east side of Fill Area 1, Unit 1 at monitoring well E-20B in 1999. Monitoring data collected from the E-20B area over the past several years have shown a continuing decrease in the concentrations of VOCs. The source of the low concentrations of VOCs detected in E-20B has been attributed to landfill gas. Landfill gas collection and extraction systems were installed as corrective actions to mitigate the impact. These efforts have resulted in improved groundwater quality at E-20B. Based on review of the data, a Revised Engineering Feasibility Study was submitted in 2005, which included continued landfill gas and condensate extraction. These WDRs adopt the corrective action measures for this area as described in the 2005 Revised Engineering Feasibility Study.

120. The Discharger in its 2015 First Semiannual MRP report stated that “Previous studies identified LFG as the source of VOC detections at VZM-A and VD2 (Geomatrix, 2001), and this is likely also the case for VD (Valley Drain location). To reduce the influence of LFG as these locations, ALRRF has been extracting LFG from VD2, LS2, and VZM-A piping systems. Liquids that are captured in the VZM-A, VD, and VD2 containment systems are handled (e.g., collected and disposed) in the same way as leachate.” The Discharger states that LFG is only being extracted from VD2 and LS2, therefore, these WDRs and MRP require the Discharger to monitor and report landfill gas removed from VD2, LS2, and piping systems as well as monitor the effectiveness of their active landfill gas extraction system in Fill Area 1.

WATER QUALITY PROTECTION STANDARDS

121. Volatile organic compounds (VOCs) are often detected in a release from a MSW landfill and are often associated with releases of landfill gas rather than leachate. Since volatile organic compounds are not naturally occurring and thus have no background value, they are not amenable to the statistical analysis procedures contained in Title 27 for the determination of a release of wastes from a landfill Unit. Title 27, sections 20415(e)(8) and (9) allows the use of a non-statistical evaluation of monitoring data that will provide the best assurance of the earliest possible detection of a release from a landfill Unit in accordance with Title 27, sections 20415(b)(1)(B)2.-4. However, Title 27 does not specify a specific method for non-statistical evaluation of monitoring data.

122. The Central Valley Water Board may specify a non-statistical data analysis method pursuant to Title 27, section 20080(a)(1). Water Code section 13360(a)(1) allows the Central Valley Water Board to specify requirements to protect groundwater or surface waters from leakage from a solid waste site, which includes a method to provide the best assurance of determining the earliest possible detection of a release.

123. In order to provide the best assurance of the earliest possible detection of a release of non-naturally occurring waste constituents from a landfill Unit, the SPRRs specify a non-statistical method for the evaluation of monitoring data for non-naturally occurring compounds. The specified non-statistical method for evaluation of monitoring data provides two criteria (or triggers) for making the determination that there has been a release of non-naturally occurring waste constituents from a landfill Unit. The presence of two non-naturally occurring waste constituents above their respective method detection limit (MDL), or one non-naturally occurring waste constituent detected above its practical quantitation limit (PQL) [aka laboratory reporting limit (RL)], indicates that a release of waste from a Unit has occurred. Following an indication of a release, verification testing must be conducted to determine whether there has been a release from the landfill Unit or the detection was a false detection. The detection of two non-naturally occurring waste constituents above the MDL as a trigger is appropriate due to the higher risk of false-positive analytical results and the corresponding increase in sampling and analytical expenses from the use of one non-naturally occurring waste constituent above its MDL as a trigger.

124. For a naturally occurring constituent of concern, the Title 27 requires concentration limits for each constituent of concern be determined as follows:

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

125. The methods for calculating concentration limits were included in the Discharger's JTD. The method uses Practical Quantitation Limits (PQLs) as the concentration limits for VOCs, and the Shewart-CUSUM control chart for intra-well statistical analysis of inorganic monitoring parameters.

126. These WDRs in Provisions H.8 required the Discharger to submit a WQPS including concentration limits and a sample collection and analysis plan that complies with the following requirements:

    a. The Discharger in its WQPS shall clearly indicate the concentration limits for each monitored medium (i.e. ground water, surface water, and unsaturated zone).
    b. The sample collection and analysis plan shall comply with the quality assurance/quality control requirements of Title 27 section 20415(e)(4)-(5).
    c. For naturally occurring monitoring parameters the Discharger shall establish concentration limits based on background monitoring data that represents the quality of ground water that has not been affected by a release from the Unit.
    d. For non-naturally occurring monitoring parameters, the Discharger shall use non-detect as the concentration limit for determination if there is measurably significant evidence of a release; or the Discharger shall submit a technical report in accordance with Title 27 section 20400 requesting establishing concentration limits

greater than background if the Discharger determines that for areas where a release has occurred, and the Discharger is implementing a corrective action program, it is technically or economically infeasible to achieve concentration limits based on background water quality.

FUTURE OPERATIONS

127. The Discharger in its JTD has proposed the development of the following additional ancillary facilities at ALRRF:

a. **A Materials Recovery Facility (MRF)** to complement and expand on the recovery of recyclables, wood waste and green waste materials. The MRF will be an enclosed facility with several processing/sorting lines that will be capable of handling 400 to 500 tons per day (tpd) of incoming waste to recover recyclables (e.g., metal, glass, plastic, paper, wood and green materials). The residual fraction will be disposed at the working face of the landfill. The MRF will be located near the LNG facility within the CUP permit area, but not within the permitted waste footprint of the ALRRF. The Discharger is currently permitted to dispose of MRF fines at ALRRF. These WDRs require the discharger to monitor and report all liquid waste generated at the MRF Facility that is classified as non-hazardous waste or designated waste and requires the Discharger to appropriately dispose of such liquid.

b. **A new truck wash facility at Fill Area 2** to service primarily outbound Fill Area 2 refuse trucks. Attachment C shows the approximate location of the truck wash facility. These WDRs contain prohibitions and specifications related to the new truck wash facility serving either Fill Area 1 or Fill Area 2

LINER SYSTEM FOR FILL AREA 2

128. The Discharger's proposed a bottom liner system in Fill Area 2 consisting of, from top to bottom:

a. A minimum 12-inch thick operations layer with minimum hydraulic conductivity of greater than 1×10^{-4} cm/sec[5];
b. A 8 ounce/yard^2 geotextile separator
c. A minimum one-foot thick granular LCRS layer;
d. A 12 ounce/yard^2 geotextile cushion layer
e. A double-sided textured 60-mil thick HDPE geomembrane;
f. A minimum two-foot compacted low-permeability soil layer[6];

[5] The Discharger may use a sufficient number of gravel drainage windows as an alternative within the operations layer properly placed to achieve the minimum hydraulic conductivity requirement in order to ensure that leachate is able to percolate through the operations layer.

[6] The Discharger's current test pad results per Title 27 section 20324(g) determined that the on-site clay source materials required addition of 3% by weight of bentonite in order to meet the maximum 1×10^{-7} cm/sec hydraulic conductivity requirements of State Water Board Resolution 93-62. The need for and percentage of bentonite admix may be modified based on additional soil source characterization and-additional test pad results.

g. A minimum one-foot compacted general earth fill layer (wetted footprint[7] area only);
h. A 8 ounce/yard^2 geotextile separator (wetted footprint area only);
i. A minimum one-foot thick groundwater subdrain gravel layer (wetted footprint area only);
j. A 8 ounce/yard^2 geotextile separator (wetted footprint area only); and
k. Prepared subgrade.

129. Side slope liners for Fill Area 2 are proposed to be constructed of, from top to bottom:

a. A minimum 24-inch thick operations layer
b. A double-sided geocomposite drainage layer LCRS;
c. A 60-mil single-sided textured HDPE geomembrane;
d. A two-foot compacted low-permeability soil layer or a Geosynthetic Clay Layer (GCL);
e. A minimum one-foot compacted general earth fill layer (wetted footprint only);
f. A double-sided subdrain drainage geocomposite (wetted footprint area only); and
g. A prepared subgrade.

130. The LCRS for the bottom liner consists of a one-foot permeable gravel layer overlying a geotextile fabric and the HDPE geomembrane; intermediate perforated collection pipe network; a depressed sump area; and a side-slope riser with leachate pump. The leachate collection and removal system for the side-slope liner consists of a double-sided geocomposite. The estimated design leachate generation rate is 580 gallons per minute. The estimated design extraction rate is 1,160 gallons per minute using a leachate pump once the Discharger constructs a depressed leachate sump at its final location at the toe of Fill Area 2 Unit 1.

131. Based on the current site development plans in the 2015 JTD, the LCRS for Fill Area 2 will consist of a 12-in. thick GDM layer at the floor of the landfill and a drainage geocomposite along the side-slopes. A perforated HDPE collection pipe will be placed within a trench running along the central axis of the floor. A series of lateral LCRS perforated pipes, spaced an average of 500 feet apart, will collect leachate across the floor and channel it towards the central collection pipe. Additionally, leachate collection pipes will be placed along benches on the side-slopes, and a perimeter collection network of pipes will be installed along the perimeter of the Fill Area 2 floor. The leachate will drain down through the geocomposite, granular LCRS layer, and piping network towards a single sump, riser pipe, and clean-out pipe at the southeastern end of the landfill.

132. The Phase 1 of Fill Area 2 containment system design features an 80-ft long 3-in. diameter HDPE LCRS test pipe (solid on slope and perforated on floor). The pipe will be placed on top of side slope geocomposite and on top of floor LCRS granular drainage layer. The pipe shall be used to perform annual LCRS testing of the Fill Area 2 Phase 1.

[7] Wetted footprint includes capillary fringe.

These WDRs require that the Discharger make provisions that in each construction phase the Discharger shall install a means to perform the annual LCRS test required in Title 27 section 20340(d).

133. The July 2015 JTD includes a stability analysis for Fill Area 1 and Fill Area 2 pursuant to Title 27, section 21750(f)(5). The Discharger's stability analysis includes components to demonstrate the integrity of the landfill foundation, refuse fill slopes, final slopes, and containment systems under both static and dynamic conditions throughout the landfill's life including the closure period and post-closure maintenance period. The stability analysis demonstrates that the structural components of Fill Area 1 and Fill Area 2 landfill foundation and containment systems will withstand the forces of the Maximum Credible Earthquake (MCE) without failure of the containment systems or environmental controls. The Discharger's July 2015 JTD states that the Discharger must perform laboratory testing to verify final slope stability of the final closure cover for Fill Area 1 and Fill Area 2. These WDRs require the Discharger to perform a slope stability analysis report based on fill sequencing for each phase of construction of Fill Area 2 prior to construction of each phase.

134. The liner system for Fill Area 2 complies with the prescriptive standards for waste containment specified in 40 Code of Federal Regulations section 258 (aka Subtitle D) and State Water Resources Control Board Resolution 93-62 Section III.A.1.

135. This Order approves the Discharger's proposed liner system for future phases of construction in Fill Area 2 Unit 1 and Fill Area 2 Unit 2 as described in Specifications D.1 and D.2 and requires that the Discharger submit design plans and construction quality assurance (CQA) plans for each new module or modules for review and approval at least 120 days prior to construction unless the Discharger chooses to proceed at their own risk.

136. Construction will proceed only after all applicable construction quality assurance plans have been approved by Central Valley Water Board staff unless the Discharger chooses to proceed at their own risk.

LINER PERFORMANCE DEMONSTRATION

137. On 15 September 2000 the Central Valley Water Board adopted Resolution No. 5-00-213 Request For The State Water Resources Control Board To Review The Adequacy Of The Prescriptive Design Requirements For Landfill Waste Containment Systems To Meet The Performance Standards Of Title 27. The State Water Board responded, in part, that "a single composite liner system continues to be an adequate minimum standard" however, the Central Valley Water Board "should require a more stringent design in a case where it determines that the minimum design will not provide adequate protection to a given body of groundwater."

138. The Discharger submitted a liner performance appraisal for construction of the composite liner system at the facility Class II waste management units (Golder

Associates, Inc. October 2001; and GeoSyntec Consultants, Inc., July 2004). The liner performance was evaluated using the Giroud and Bonaparte [1989] leakage model as incorporated in the USEPA-approved HELP [Schroeder et al., 1997] model. The results of the liner performance demonstration showed that the estimated leakage potential of the composite liner proposed for the site is very small, and conversely, the containment efficiency of the proposed liner system is "high" (i.e., computed as greater than 99.999%). The leakage potential is predicted to range from zero to a very small amount (maximum calculated potential leakage rate of 1.5×10^{-3} gal/acre/day during initial operations) based upon the results of the HELP analyses. Upon buildout of the landfill, the HELP analyses predict a maximum calculated potential leakage rate of 3.9×10^{-4} gal/acre/day and a containment efficiency of 99.9997%. The HELP analyses are in agreement with the observations from double-lined landfills presented in a study sponsored by the USEPA [Bonaparte, et al., 2002]. Therefore, the liner performance appraisals comply with the requirements in Title 27.

FINAL CLOSURE COVERS

139. The Discharger in its July 2015 JTD proposes the following final closure cover systems:

    a. For unlined Fill Area 1 Unit 1 an engineered alternative (from bottom to top):
        (1) 2-feet of compacted soil
        (2) 2-feet of soil placed loosely at below optimum moisture; and
        (3) A vegetative cover selected to maximize removal of moisture from the cover.

    b. For composite lined Fill Area 1 Unit 2 and Fill Area 2 (from bottom to top):
        (1) 2-feet of foundation layer comprised of random soils;
        (2) Minimum 1-foot of low-permeability layer of compacted fine grained soils or GCL equivalent, which will yield an equivalent low flow-through rate of 1×10^{-7} cm/s or less;
        (3) a flexible membrane liner (FML) consisting of a minimum 60-mil HDPE cover;
        (4) a synthetic drainage layer (e.g., geonet) overlain by 16-ounce/sy geotextile material; and
        (5) a 1-ft vegetative layer comprised of random soils.

140. Title 27 section 21090(a)(2) requires that the prescriptive standard for a final closure cover contain a 1-foot low permeability layer with a hydraulic conductivity of either 1×10^{-6} cm/sec (i.e., 1 ft/yr) or less, or equal to the hydraulic conductivity of any bottom liner system or underlying natural geologic materials, whichever is less permeable, or another design which provides a correspondingly low through-flow rate throughout the post-closure maintenance period.

141. Fill Area 1 Unit 1 is an <u>unlined</u> Unit that is currently in corrective action for known releases of VOCs to groundwater. Title 27 section 20950(a)(2)(A)(1) requires that part of

the performance standard for closed Units is that *"the final cover constitutes the Unit's principal waste containment feature".* The Discharger is therefore required to construct a final closure cover over Fill Area 1 Unit 1 that conforms to the provisions of Title 27.

CONSTRUCTION AND ENGINEERED ALTERNATIVE

142. On 17 June 1993, the State Water Board adopted Resolution 93-62 implementing a State Policy for the construction, monitoring, and operation of municipal solid waste landfills that is consistent with the federal municipal solid waste regulations promulgated under 40 Code of Federal Regulations section 258 (aka Subtitle D). Resolution 93-62 requires the construction of a specified composite liner system at new municipal solid waste landfills, or expansion areas of existing municipal solid waste landfills, that receive wastes after 9 October 1993. Resolution 93-62 also allows the Central Valley Water Board to consider the approval of engineered alternatives to the prescriptive standard. Section III.A.b. of Resolution 93-62 requires that the engineered alternative liner systems be of a composite design similar to the prescriptive standard.

143. Title 27, section 20080(b) allows the Central Valley Water Board to consider the approval of an engineered alternative to the prescriptive standard. In order to approve an engineered alternative in accordance with Title 27, sections 20080(c)(1) and (2), the Discharger must demonstrate that the prescriptive design is unreasonably and unnecessarily burdensome and will cost substantially more than an alternative which will meet the criteria contained in Title 27, section 20080(b), or would be impractical and would not promote attainment of applicable performance standards. The Discharger must also demonstrate that the proposed engineered alternative liner system is consistent with the performance goal addressed by the particular prescriptive standard, and provides protection against water quality impairment equivalent to the prescriptive standard in accordance with Title 27, section 20080(b)(2).

144. Water Code section 13360(a)(1) allows the Central Valley Water Board to specify the design, type of construction, and/or particular manner in which compliance must be met in waste discharge requirements or orders for the discharge of waste at solid waste disposal facilities.

145. The Discharger proposes an engineered alternative liner system for the Class II surface impoundments which will be designed, constructed, and operated in accordance with the criteria set forth in Title 27, and the provisions in State Water Board Resolution 93-62 for municipal solid wastes.

ENGINEERED ALTERNATIVE FOR GROUNDWATER SEPARATION

146. The Discharger submitted a Report of Waste Discharge requesting approval of an engineered alternative to five feet of groundwater separation for Fill Area 2 similar to that constructed in Fill Area 1, Unit 2. The Discharger proposes to install an underdrain drainage network below the WMU's liner system in order to achieve three feet of separation in Fill Area 2. This Order conditionally approves the proposed three feet of

separation for Fill Area 2 and requires that the Discharger monitor the water in the groundwater underdrain for impacts. If impacts are found and confirmed, the Discharger must re-evaluate the previously approved alternative design. If a new alternative design is proposed and approved by staff, a WDR revision by the Central Valley Water Board will be required in order to implement the new alternative. Otherwise, the Discharger must provide five feet of separation in all future units in Fill Area 2 constructed after the impacts are found (Discharge Specification B.8). The Discharger must also investigate and remediate the impacts as required in section G. Detection Monitoring Specifications of these WDRs.

ENGINEERED ALTERNATIVE FOR CLASS II SURFACE IMPOUNDMENTS LINER SYSTEM

147. The Discharger proposes an engineered alternative to the prescriptive liner requirements of Title 27 for the three Class II surface impoundments. The engineered alternative consists of from the top down:

a. 1 foot gravel operations layer (optional, base area only);
b. 40-mil sacrificial HDPE geomembrane (optional, side slopes only);
c. the primary 60-mil-thick HDPE geomembrane;
d. HDPE Geonet drainage layer;
e. LCRS gravel (in LCRS sump area only);
f. The secondary 40-mil HDPE geomembrane;
g. A geosynthetic clay liner (GCL) (engineered alternative containment layer);
h. A pan lysimeter single sided geocomposite;
i. Pan lysimeter gravel;
j. A 40-mil HDPE geomembrane (only under pan lysimeter);
k. 4-inch select soil liner bedding; and
l. A compacted subgrade.

148. The Discharger has proposed substituting the prescriptive requirement for a two-foot compacted low-permeability soil layer as part of the composite liner system for waste containment with a geosynthetic clay liner (GCL) with equivalent or better low permeability qualities.

149. For the 8-million gallon Fill Area 2 Class II surface impoundment, the Discharger proposed an optional operations layer and sacrificial geomembrane layer to protect the primary liner when the impoundments are cleaned out. These layers are also optional in the other two Class II surface impoundments based on operational and maintenance needs.

150. The Class II surface impoundments will be graded with positive slopes such that the geocomposite LCRS layer will drain to a LCRS collection sump. The Discharger's design consultant has certified that a 0.5% drainage slope (non-standard slope specification) on the bottom of the Fill Area 2 Class II surface impoundment is sufficient to ensure unconfined flow of leachate in the LCRS drainage layer. The LCRS sump will

have minimum plan dimensions of 3 meters (10 feet) square, a minimum thickness of 0.3 meters (one-foot), and a minimum volume of about 2.83 meters^3 (~100 cubic feet). The LCRS sump will contain drainage gravel and a minimum 0.45-meter (18-inch) diameter perforated HDPE collection pipe(s) for removal of any liquid from the leak detection system.

151. The LCRS geocomposite drainage layer will have a minimum transmissivity of 4 x 10^{-4} meters^2 per second (4 x 10^{-3} feet^2 per second). Assuming a hypothetical damage to the primary geomembrane liner equal to a 1 millimeter diameter hole for every acre of lined area (suggested standard value for modern liner construction & CQA) and a maximum permitted hydraulic head of 0.3m (e.g., 12-inch maximum), the LCRS geocomposite will have a flow capacity of 20 meters^3 per acre per day (e.g., >5,000 gallons per acre per day). The minimum 0.45-meter (18-inch) diameter perforated HDPE collection pipe(s) and LCRS sump will both have capacities of at least 21 meters^3 per acre per day (~5,550 gallons per acre per day). Given a recommended Action Leakage Rate of 7.57 meters^3 per acre per day (2,000 gallons per acre per day) for the Class II Impoundments, the proposed LCRS geocomposite drainage layer, sump, and pump system will exceed the volume of leachate by 2.5 times. This exceeds the minimum requirement of 2.0 times as required by Title 27.

152. For Fill Area 2 Unit 1, the Discharger has installed an approximately 1-mile long 8-inch inside diameter double-walled conveyance pipe to convey leachate collected via gravity to the 8-million gallon leachate storage pond. The pipeline and leachate pond are shown on Attachment C. The Discharger's sizing of the 8-inch conveyance pipe relied upon the Discharger diverting a majority of a 1000-year 24-hour storm event (design storm) falling on the WMUs when waste is initially placed. These WDRs require the Discharger to install stormwater diversion structures in accordance with Title 27 section 20365 in order to prevent inundation of the leachate conveyance pipe and exceedance of the 1-foot maximum head requirement on the LCRS primary liner.

153. The Discharger adequately demonstrated that construction of a Subtitle D prescriptive standard liner for all three Class II surface impoundments would be unreasonably and unnecessarily burdensome when compared to the proposed engineered alternative design. The Discharger demonstrated that the proposed engineered alternative is consistent with the performance goals of the prescriptive standard and affords at least equivalent protection against water quality impairment.

ENGINEERED ALTERNATIVE FOR LANDFILL CLOSURE COVER

154. Title 27 CCR Sections 21780(c)(3) and (d)(1) [sections promulgated by the CIWMB] require the Discharger to submit the final closure and post-closure maintenance plan, or for the closure of discrete units, the partial final closure and post-closure maintenance plan, at least two years prior to the anticipated date of closure.

155. Title 27, section 21090 provides the minimum prescriptive final cover components for landfills consisting of, in ascending order, the following layers:

a. Two-foot soil foundation layer.
b. One-foot soil low flow-hydraulic conductivity layer, no more than $1x10^{-6}$ cm/s or equal to the hydraulic conductivity of any bottom liner system or underlying natural geologic materials, whichever is less permeable.
c. One-foot soil erosion resistant/vegetative layer.

156. Title 27 allows engineered alternative final covers provided the alternative design will provide a correspondingly low flow-through rate throughout the post-closure maintenance period.

157. In 1989, the Discharger closed approximately 9 acres of Fill Area 1, Unit 1 with a soil cover. In 1992, the Discharger closed approximately 17.8 acres of Fill Area 1, Unit 1 with a soil cover consisting of a one foot vegetative soil layer over a one foot compacted clay soil layer over existing interim cover.

158. The Discharger submitted a December 2008 Alternative Final Cover (AFC) Design Report ((Dwyer, Valceschini, and Obereiner, December 2008 hereafter referred to as AFC Report) for the remainder of Fill Area 1 (Units 1 and 2). The proposed alternative final cover is an evapotranspirative (ET) cover, also known as a water balance cover. This type of cover functions by storing moisture between the soil particles during the rainy season, and releasing that moisture during the growing season and dry season through plant uptake and evaporation. The AFC Report states that this type of cover has advantages over a prescriptive cover that include better ability to accommodate settling and subsidence, increased rooting depth for native vegetation, better static and seismic slope stability, reduced complexity for long-term maintenance, better ecological diversity and density, and potentially increased end-use capabilities.

159. Federal regulations allow for alternative final covers that provide an “equivalent reduction in flux” to the prescriptive standard, and State regulations under Title 27 indicate that a “similar low through-flow rate” should be achieved. State regulations also say that alternatives can be approved that “will continue to isolate the waste in the Unit from precipitation and irrigations waters at least as well as would a final cover built in accordance with applicable prescriptive standards.”

160. The AFC Report presented results from a five-year pilot study of a four-foot thick ET cover conducted under the Alternative Covers Assessment Project (ACAP), a US EPA program. The project was one of many ACAP projects conducted in California and the United States. The ACAP cover performed well until the third year of the study at which point increased percolation was measured in the underlying lysimeter. Moisture probe and lysimeter data indicated an immediate response to rainfall even at the deepest points in the cover. The Discharger concluded that preferential flow was occurring, and that it was caused by shrinkage of the soil away from the edges of the lysimeters and moisture probes. The Discharger also concluded that the cause was its placement at above-optimum moisture and with too much compaction that would cause the soil to shrink when it dried out during the summer.

161. The AFC Report also presented information from the examination of the existing final covers that were installed in 1989 and 1992. Several trenches were dug into the covers to examine the soil and rooting depths. The soil was found to be in generally good condition, with no evidence of preferential flow having developed during the almost 20 years since the covers were installed. The Discharger also conducted a borrow source investigation to verify the properties of the particular types of soil needed to complete the proposed final cover.

162. Based on the above information, the Discharger designed a proposed four-foot thick ET cover consisting of two feet of soil placed loosely at below-optimum moisture over two feet of compacted soil, a design similar to the cover placed in 1992. The cover would be vegetated using native annual and perennial species selected to maximize removal of moisture from the cover. The Discharger conducted extensive modeling of the proposed cover over a ten-year period, including the two wettest years on record (1982-83) using rainfall data from the nearby Livermore station. The cover was also modeled under conditions of five consecutive years of above average precipitation of 17.7 inches per year based on 2005 rainfall. Rainfall was measured at the ACAP test plot during the study and indicated rainfall at the site is similar to, but slightly less than that measured at the Livermore station that averages 14.8 inches per year. The modeling indicated that the proposed cover would allow percolation to a maximum depth of 23.2 inches into the cover over the ten year period under the above average precipitation conditions that included the wettest two years on record. The modeling also indicated that the proposed cover would allow percolation to a maximum depth of 20.1 inches over the five-year period of above-average rainfall. These results indicate that there would be negligible flux through the proposed four-foot (48-inch) cover under either scenario, and that it would therefore meet both the State and federal regulatory requirements.

163. This Order approves the proposed alternative ET final cover design for closure of the remainder of Fill Area 1, Unit 1, with a contingency that the Discharger can demonstrate that the ET cover isolates the underlying wastes from precipitation as required by Title 27 sections 20950(a)(2)(A)(1) and 21090(a) for correspondingly low through-flow rate in the case where there is the absence of a bottom liner system (unlined WMU). These WDRs require the Discharger to substantiate the correspondingly low through-flow rate through monitoring and other means of validation and verification. The Discharger shall implement an approved contingency plan if the installed ET cover over Fill Area 1 Unit 1 fails to meet the performance objectives described in the AFC Report for providing correspondingly low through-flow rate per Title 27 regulations in the case where there is the absence of a bottom liner system and known releases are occurring.

164. Prior to approval of an alternative final cover for Fill Area 1, Unit 2, or for Fill Area 2, this Order requires the Discharger to monitor the performance of a minimum 10-acre ET cover over Fill Area 1 for a maximum monitoring period of four years after it is installed on Fill Area 1. This Order requires that the Discharger provide a monitoring and contingency plan for review and approval by the Executive Officer to monitor the installed ET cover for the maximum period of four years. The purpose of the monitoring period is to provide additional data upon which to evaluate whether the ET cover will

perform as modeled, given that the ACAP cover did not perform as expected, prior to approval of an alternative ET cover for the remainder of the landfill WMUs. Once the four year monitoring period is completed and the Discharger demonstrates that the minimum 10-acre ET Cover meets the performance objectives described in the AFC Report and provides correspondingly low through-flow rate per Title 27 regulations for WMUs with a bottom liner system, the Discharger may install the alternative ET final cover over Fill Area 1, Unit 2, and if desired, over Fill Area 2 with any necessary adjustments to the proposed design based on the monitoring results and Central Valley Water Board staff approvals.

165. The Discharger proposes that side slopes for closed Fill Area 1 will be sloped at 2H:1V and will include 10-foot wide benches every 50 vertical feet with a top deck area having slope gradients of no less than 5% to promote drainage of precipitation from the WMU final closure cover. The Discharger's JTD indicates that final grading the top deck area with a minimum 5% slope gradient will account for settlement allowing the top deck area to continue to meet the 3% slope gradient requirement of Title 27 during the post closure maintenance period. Title 27 section 21090(a) also requires 15-foot wide benches every 50 vertical feet. These WDRs include specifications requiring the Discharger to construct 15-foot wide benches every 50 vertical feet on the side slopes of closed Fill Area 1 where the side slopes have not already been constructed with 10-foot benches at the time of adoption of these WDRs and the Discharger has indicated that the narrower bench will not prevent the Discharger from performing post closure maintenance in these areas.

166. Title 27 section 21090(a) requires that designs having any slopes steeper than 3H:1V, or having a geosynthetic component, shall have these aspects of their design specifically supported in the slope stability report required under Title 27 section 21750(f)(5). The Discharger has performed a slope stability analysis for the proposed final cover for Fill Area 1. The Discharger determined that for side slopes of 2H:1V the compatibility of the cover materials selected for construction must be evaluated prior to construction of the cover system by comparing site-specific laboratory interface shear strengths (obtained from tests performed at low normal stresses consistent with cover conditions) with the strengths presented in the slope stability analyses. The combination of cohesion or adhesion and friction angle must be sufficient to meet or exceed the minimum required strength envelope. The Discharger determined that given the slope inclinations, if the materials as tested do not meet the design strength envelopes for one or more of the scenarios, reinforcement or an engineered alternative cover system may be required to achieve an acceptable degree of stability and deformation control These WDRs in the specifications require the Discharger to perform the necessary laboratory tests and analysis required to ensure that the Discharger complies with the slope stability requirements of Title 27.

167. Based on the current site development plans in the 2015 JTD, the Discharger proposes that side slopes for closed Fill Area 2 will be sloped at 3H:1V and will include 20-foot wide benches every 50 vertical feet with a top deck area having slope gradients of no less than 5% to promote drainage of precipitation from the WMU final closure cover. The

Discharger's JTD indicates that final grading the top deck area with a minimum 5% slope gradient and in other areas at 8% (i.e., access roads) will account for settlement allowing the top deck area to continue to meet the 3% slope gradient requirement of Title 27 during the post closure maintenance period. While final closure configurations will vary, final design must conform to minimum slope stability and drainage standards.

168. Title 27 section 21090(a) requires that designs having any slopes steeper than 3H:1V, or having a geosynthetic component, shall have these aspects of their design specifically supported in the slope stability report required under Title 27 section 21750(f)(5). The Discharger's proposed final closure cover for Fill Area 2 includes a geosynthetic component and requires a slope stability analysis. The Discharger determined that the compatibility of the cover materials selected for construction must be evaluated prior to construction of the cover system by comparing site-specific laboratory interface shear strengths (obtained from tests performed at low normal stresses consistent with cover conditions) with the strengths presented in the slope stability analyses. The combination of cohesion or adhesion and friction angle must be sufficient to meet or exceed the minimum required strength envelope. These WDRs in the specifications require the Discharger to perform the necessary laboratory tests and analysis required to ensure that the Discharger complies with the slope stability requirements of Title 27.

169. This Order approves the proposed final cover(s) with provisions where required and also requires that a final closure and post-closure maintenance plan to be submitted at least two years prior to the anticipated closure date for review and approval, with the exception of Fill Area 1. This Order allows the Discharger additional time to conduct a demonstration of the ET cover; therefore, the final closure and post-closure maintenance plan may be submitted 6 months prior to closure. This Order also requires that design documents and associated CQA plan be submitted for review and approval at least 120 days prior to construction unless the Discharger chooses to proceed at their own risk.

CLOSURE OF FILL AREA 1

170. The Discharger submitted a 2015 Preliminary Closure and Postclosure Maintenance Plan for closure and post-closure maintenance of all the unlined and composite-lined landfill Units at the facility as part of its 2015 JTD. The Discharger in its July 2015 JTD provided a tentative schedule to construct a 10-acre ET demonstration project in 2017, monitor the demonstration project for four years, and then start closing Fill Area 1 in 20 to 30 acre increments over the next ten years. The starting closure date is contingent upon the remaining airspace in Fill Area 1 which, at the time of this revision, was equal to 4 to 5 million tons. Based on this information, these WDRs in Provisions H.8 require the Discharger to construct the 10-acre ET Demonstration Project by December 2017, monitor the effectiveness of the ET cover from 2018 to 2022, submit an updated plan to address closure of Fill Area 1 over the next ten years in 2023, and to initiate closure operations in 2023.

CLOSURE OF CLASS II SURFACE IMPOUNDMENTS

171. For the Class II surface impoundments Section 21400(b)(1) of CCR Title 27 states: Unless the Discharger demonstrates, and the RWQCB finds, that it is infeasible to attempt clean-closure of the impoundment, then all residual wastes, including sludges, precipitates, settled solids, and liner materials contaminated by wastes, shall be completely removed from the impoundment and discharged to an approved Unit. Remaining containment features shall be inspected for contamination and, if not contaminated, can be dismantled. Any natural geologic materials beneath or adjacent to the closed impoundment that have been contaminated shall be removed for disposal at an appropriate Unit. For surface impoundments that are successfully clean-closed, as herein described, the RWQCB shall declare the Unit no longer subject to the SWRCB-promulgated requirements of this title. If, after reasonable attempts to remove such contaminated materials, the Discharger demonstrates that removal of all remaining contamination is infeasible, the surface impoundment shall be closed as a landfill or land treatment unit, as appropriate, pursuant to 21400(b)()(2) of CCR Title 27. The Discharger must submit a clean closure plan at least 180 days prior to clean closure of a Class II surface impoundment.

LEACHATE, LANDFILL GAS CONDENSATE, AND UNDERDRAIN LIQUIDS MANAGEMENT AFTER CLOSURE

172. Title 27 section 20950(a)(2)(A)(1) states that "the goal of closure, including but not limited to the installation of a final cover, is to minimize the infiltration of water into the waste, thereby minimizing the production of leachate and gas. For such Units, after closure, the final cover constitutes the Unit’s principal waste containment feature." The introduction of liquids such as but not limited to leachate, landfill gas condensate, and underdrain liquids management into a closed Unit is contrary to the goal of closure of a Unit for Units not designed of constructed to rely on the liner system as the principal means of waste containment. It has been proposed at the Facility that after closure the introduction of liquids into closed Units is recommended to increase landfill gas production, reduce waste volumes through degradation of waste in the production of landfill gas, and to accelerate settlement of waste as seen in normal operations of a WMU designed as a bioreactor. However, the Discharger did not design the WMUs at the Facility as bioreactors where the Discharger after closure continues to rely on the liner system as the WMU's principal waste containment feature. Therefore, these WDRs prohibit the intentional introduction of liquids into a Unit after installation of a final closure cover.

POST-EARTHQUAKE INSPECTION AND RESPONSE PLAN

173. As stated in Site Description and Geology sections above, the landfill property is situated in an area that historically has been susceptible to mass movement on natural slopes as shown in Attachment G. Furthermore, several geologic faults exist below the

WMUs. Therefore, to ensure that the Facility's waste containment structures have not sustained damage after a significant earthquake event the Discharger is required to implement its Post-Earthquake Inspection and Response Plan identified as one of its operations plans in its JTD section 2.7.9 as required by this Order and report the results of the inspection. An inspection will be conducted following an earthquake of Magnitude (M_w) 5.0 or greater within 25 miles of the facility or a Magnitude (M_w) 6.0 or greater earthquake within 50 miles of the facility.

LANDFILL POST-CLOSURE MAINTENANCE

174. The Discharger submitted a 2015 *Preliminary Closure and Postclosure Maintenance Plan* as part of their 2015 JTD for closure and post-closure maintenance of Fill Area 1 and Fill Area 2. The plan includes inspection, maintenance, and monitoring of the landfill during the post-closure maintenance period, and includes a post-closure maintenance cost estimate for the entire facility. Inspection and maintenance will include the condition of the final cover, drainage features, LCRS, groundwater monitoring wells, unsaturated zone monitoring points, access roads, landfill gas system, groundwater corrective action system, and site security. The plan will be implemented for a minimum period of 30 years or until the waste no longer poses a threat to environmental quality, whichever is greater.

175. Pursuant to Title 27, section 21090(e)(1), this Order requires a survey of the final cover following closure activities for later comparison with iso-settlement surveys required to be conducted every five years.

176. Once every five years during the post-closure maintenance period, aerial photographic maps of the closed landfill area will be made to identify and evaluate landfill settlement. Iso-settlement maps will be prepared to determine the amount of differential settlement occurring over the previous five years. Pursuant to Title 27, section 21090(e)(2), this Order requires iso-settlement maps to be prepared and submitted every five years.

177. Pursuant to California Code of Regulations, Title 17, section 95471(c) and Title 27, section 21090(a)(4)(A) the Discharger is required to carry out periodic monitoring of the integrity of the low-hydraulic-conductivity layer, including a method for effectively identifying and repairing breaches in that layer. Defects will be repaired and tested for adequacy based on the closure CQA Plan. This Order requires the Discharger to carry out periodic monitoring of the integrity of the low-hydraulic-conductivity layer, including a method for effectively identifying and repairing breaches in that layer.

FINANCIAL ASSURANCES

178. Title 27, sections 21820 and 22206 require a cost estimate for landfill closure. The cost estimate must be equal to the cost of closing the landfill at the point in its active life when the extent and manner of operation would make closure the most expensive. When closing Units in phases, the estimate may account for closing only the maximum area or Unit of a landfill open at any time. The Discharger's *Preliminary Closure and*

Post Closure Maintenance Plan updated in the Discharger's 2015 JTD includes a cost estimate for landfill closure. The lump sum estimate is for the cost to close the largest future area needing closure at any one time. The total amount of the closure cost estimate in 2015 dollars is $34.86 million for closure of Fill Area 1 Unit 1, Fill Area 1 Unit 2, and Fill Area 2 Unit 1 Phase 1 ($5.92 million, $23.22 million, and $5.65 million, respectively). The closure costs assume the cost for installation of an ET final cover over Fill Area 1 Unit 1 and a geocomposite final cover over Fill Area 1 Unit 2 and Fill Area 2 Unit 1 Phase 1. This Order requires that the Discharger provide future financial assurance closure cost estimates in compliance with Title 27, and maintain financial assurance with the California Department of Resources Recycling and Recovery (CalRecycle) in at least the amount of the closure cost estimate. As of 2015, the balance of the closure fund was $34.8 million in the form of an irrevocable bond with CalRecycle as the beneficiary.

179. The Discharger has constructed an 8 million gallon surface impoundment and leachate conveyance system to collect and store leachate from Fill Area 2, Unit 1 and proposes to construct two 4.6 and 4.8 million gallon Class II surface impoundments to collect and store leachate from Fill Area 1 in the near future. However the Discharger has not provided closure cost estimates or financial assurances for clean closure of these Units. These WDRs in Provisions H.8 require the Discharger to update its preliminary closure plan to include cost estimates for closure of any constructed Class II surface impoundment and provide financial assurances for clean closure.

180. Title 27, sections 21840 and 22211 requires a cost estimate for landfill post-closure maintenance. The Discharger's 2015 *Preliminary Closure and Post Closure Maintenance Plan* updated in the Discharger's 2015 JTD includes a cost estimate for landfill post-closure maintenance Fill Area 1 Unit 1, Fill Area 1 Unit 2, and Fill Area 2 Unit 1 Phase 1. The amount of the cost estimate for annual post-closure maintenance in 2015 dollars is $0.774 million or $23.21 million for a 30-year period. This Order requires that the Discharger maintain financial assurance with CalRecycle in at least the amount of the post-closure maintenance cost estimate adjusted annually for inflation.

181. Title 27, section 22221 requires a cost estimate for corrective action of all known or reasonably foreseeable releases. The Discharger submitted a 2015 cost estimate of $1 million for corrective action of all known or reasonably foreseeable releases ($1 million for water release and $0.58 million for non-water release, whichever is higher). This Order requires that the Discharger maintain financial assurance with the CalRecycle in at least the amount of the cost estimate adjusted annually for inflation. As of 2015, the balance of the corrective action fund was $1 million in the form of an irrevocable bond with CalRecycle as the beneficiary.

182. The Discharger has constructed an 8 million gallon surface impoundment and leachate conveyance system to collect and store leachate from Fill Area 2, Unit 1 and proposes to construct two Class II surface impoundments (4.6 and 4.8 million gallon) to collect and store leachate from Fill Area 1 or Fill Area 2 as well as other sources of Class II liquid waste in the near future, provided the water balance for the leachate pond

accommodates leachate from other units. However the Discharger has not provided cost estimates or financial assurances for corrective action for all known or reasonably foreseeable releases from these Units. These WDRs in Provisions H.8 require the Discharger to update its cost estimate for corrective action of all known or reasonably foreseeable releases from all constructed Class II surface impoundments and provide financial assurances for corrective action due to a water release prior to their initiation of operation.

CEQA AND OTHER CONSIDERATIONS

183. Waste Management of Alameda County owns and operates the facility under the existing Conditional Use Permit (CUP) C-6395. The March 1996 Final Environmental Impact Report (EIR), consisting of the Draft EIR together with the Response to Comments document, was certified by the Zoning Administrator and the Alameda County Board of Supervisors in 1996 for expansion of the landfill into Fill Area 2. The new CUP (C-5512) was issued by the Zoning Administrator in May 1996. It was appealed and upheld by the Alameda County Board of Supervisors through the adoption of Resolution No. R-97-284 on 5 December 1996, which imposed additional conditions on the approved expansion and reduced the expansion to 80 million tons. Subsequent litigation in California Superior Court in 1997 led to the withdrawal of CUP C-5512 by the Alameda County Board of Supervisors. A negotiated settlement to the lawsuit was reached by all parties in December 1999, approving the development of 40 million tons of MSW landfill capacity for Fill Area 2, plus additional associated capacity for daily and immediate cover soil, alternate daily cover materials, and final cover system. The settlement also limited the area of Fill Area 2 to 250 acres. The Alameda County Board of Supervisors certified and amended the Final EIR and reissued CUP C-5512 on 9 March 2000. The EIR identified the following potential significant impacts:

a. Leachate may infiltrate groundwater
b. Potentially increase leachate generation
c. Storm water runoff contacting landfill waste

184. The EIR evaluated the impacts and found that compliance with Title 27 and Subtitle D will provide adequate water quality protection and reduce potential impacts to a less than significant level.

185. The action to revise waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality Act (CEQA), Public Resource Code section 21000, et seq., and the CEQA guidelines, in accordance with Title 14, section 15301.

186. The *Statement of Policy With Respect to Maintaining High Quality of Waters in California*, SWRCB Order WQ 68-16 (hereinafter "Anti-Degradation Policy") was adopted by the State Water Board in October 1968. Anti-Degradation Policy limits the Board’s discretion to authorize the degradation of "high-quality waters." This policy has

been incorporated into the Board's Basin Plans. "High-quality waters" are defined as those waters where water quality is more than sufficient to support beneficial uses designated in the Board's Basin Plan. Whether or not a water is a high-quality water is established on a constituent-by-constituent basis, which means that an aquifer can be considered a high-quality water with respect to one constituent, but not for others. (SWRCB Order No. WQ 91-10.)

187. Anti-Degradation Policy applies when an activity discharges to high quality waters and will result in some degradation of such high quality waters. When it applies, the Policy requires that WDRs reflect best practicable treatment or control (BPTC) of wastes and that any degradation of high quality waters (a) will be consistent with the maximum benefit to the people of the State, and (b) will not result in an exceedance of water quality objectives. If the activity will not result in the degradation of high quality waters, Anti-Degradation Policy does not apply, and the Discharger need only demonstrate that it will use "best efforts" to control the discharge of waste.

188. Anti-Degradation Policy does not apply to the discharge of waste to Altamont Landfill and Resource Recovery Facility. The requirements of this Order are designed to ensure that any such wastes remain contained at the facility and will not reach waters of the State. The requirements of this Order reflect the Discharger's best efforts to control such wastes.

189. This order implements:

a. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition;
b. The prescriptive standards and performance goals of California Code of Regulations, title 27, section 20005 et seq., effective 18 July 1997, and subsequent revisions;
c. State Water Board Resolution 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*, adopted 17 June 1993, and revised on 21 July 2005.
d. The applicable provisions of Title 40 C.F.R. section 258 "Subtitle D" federal regulations as required by State Water Board Resolution 93-62.

190. Based on the threat and complexity of the discharge, the Facility is determined to be classified 1-A as defined below:

a. Category 1 threat to water quality, defined as, "Those discharges of waste that could cause the long-term loss of a designated beneficial use of the receiving water. Examples of long-term loss of a beneficial use include the loss of drinking water supply, the closure of an area used for water contact recreation, or the posting of an area used for spawning or growth of aquatic resources, including shellfish and migratory fish."
b. Category A complexity, defined as, "Any discharge or toxic wastes; any small volume discharge containing toxic waste; any facility having numerous discharge points and groundwater monitoring; or any Class 1 waste management unit."

191. Water Code section 13267(b) provides that: "In conducting an investigation specified in subdivision (a), the Regional Board may require that any person who has discharged, discharges, or is suspected of having discharge or 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 having discharged or 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 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.

192. The technical reports required by this Order and the attached Monitoring and Reporting Program R5-2016-0042 are necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.

PROCEDURAL REQUIREMENTS

193. 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.

194. 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.

195. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.

196. Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date that this Order becomes final, except that if the thirtieth day following the date that this Order becomes final falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

    http://www.waterboards.ca.gov/public_notices/petitions/water_quality
    or will be provided upon request.

IT IS HEREBY ORDERED, pursuant to California Water Code sections 13263 and 13267, that Order R5-2009-0055 is rescinded except for purposes of enforcement, and that Waste Management of Alameda County, Inc., a wholly owned subsidiary of Waste Management, its agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

A. PROHIBITIONS

1. The discharge of 'hazardous waste' or 'designated waste' into Fill Area 1, Unit 1, a Class III landfill WMU is prohibited except Fill Area 1, Unit 1 may accept asbestos in the designated area shown in Attachment C. For the purposes of this Order, the term 'hazardous waste' is as defined in California Code of Regulations, Title 23, section 2510 et seq., and 'designated waste' is as defined in Title 27 and described in Monitoring and Reporting Program (MRP) 2016-0042.

2. The discharge of 'hazardous waste' into any Class II WMU is prohibited except for asbestos in designated areas documented by the Discharger. For the purposes of this Order, the term 'hazardous waste' is as defined in California Code of Regulations, Title 23, section 2510 et seq. Any violation of Prohibitions 1 and 2 shall be reported in accordance with the Discharger's MRP R5-2016-0042.

3. The discharge of treated auto shredder wastes at the landfill facility is prohibited if DTSC makes the determination that this material requires management at a Class I facility. The discharge of all untreated auto shredder waste is prohibited.

4. The discharge of wastes outside of a Unit or portions of a Unit specifically designed for their containment is prohibited.

5. The discharge of waste constituents to the unsaturated zone or to groundwater is prohibited.

6. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.

7. The discharge of wastes that have the potential to reduce or impair the integrity of containment structures is prohibited.

8. The discharge of wastes which, if commingled with other wastes in the Unit, could produce violent reaction, heat or pressure, fire or explosion, toxic by-products, or reaction products which in turn require a higher level of containment than provided by the Unit, or are "restricted hazardous wastes", is prohibited.

9. The Discharge of any liquid wastes to the Class II surface impoundments prior to submittal of a final construction report, completion of electronic leak survey of the primary and secondary geomembrane liners used for waste containment, receipt of

approval of the construction, and approval of financial assurance documents by the Central Valley Water Board staff is prohibited.

10. The discharge of any waste, including liquids such as but not limited to landfill leachate, landfill gas condensate, and landfill underdrain discharges into a closed Unit is prohibited.

11. The Discharger is prohibited from discharging any waste that contains liquid in excess of the moisture holding capacity of the waste in the Class III and Class II landfill, or which contains liquid in excess of the moisture holding capacity as a result of waste management operations, compaction, or settlement, per Title 27 section 20200(d).

12. The Discharger is prohibited from discharging liquids generated at the MRF Facility (once constructed) that are classified as non-hazardous waste or designated waste to any WMU other than Class II surface impoundments unless it meets the conditions of Prohibition A.13 above.

13. The Discharger is prohibited from disposing of liquid waste including but not limited to liquid waste generated from recycling operations, truck wash facilities, landfill gas-to-energy plants, and vehicle maintenance facilities, to a WMU except for the intent and purposes listed in Title 27 section 21090(a)(5)(B) for closed WMUs and Title 27 section 20705(f) for active and inactive WMUs. The prohibition does not apply to leachate and landfill gas condensate returned to the lined landfill Unit from which it came so long as it does not cause instability of the waste, does not cause leachate seeps, does not generate additional landfill gas that is not extracted from the landfill by an active landfill gas extraction system, does not cause contaminants to enter surface water runoff, and does not cause leachate volumes to exceed the maximum capacity of the LCRS.

14. The Discharger is prohibited from constructing and/or operating containment structures for the purpose of containing liquids such as but not limited to non-contact storm water detention/sedimentation ponds, and liquid conveyance structures at the Facility where the discharge from such structures interferes with the Discharger's ability to collect and analyze representative samples from receiving waters necessary for the purpose of providing best assurance of the earliest possible detection of a release and/or demonstrating the effectiveness of a corrective action program.

15. The Discharger is prohibited from using alternative daily cover material on areas of the landfill that drain or cause percolation outside of the limits of the contiguous landfill Unit's LCRS unless the Discharger demonstrates to Central Valley Water Board staff that runoff and/or percolation from the LEA approved ADC will not degrade or pose a threat to receiving surface and/or groundwater quality if the Discharger proposes to use the ADC on areas of the landfill that drain and/or percolate outside of the limits of the contiguous landfill Unit's LCRS. This demonstration may take removal of sediment or suspended solids into account for landfills where surface water drains to a sedimentation basin.

16. The Discharger is prohibited from installing underground utilities in or below any low permeability layer of a final cover.

17. The Discharger is prohibited from installing underground utilities that convey liquids in any layer of a final cover system unless the Discharger institutes periodic inspection of the underground utilities to ensure that liquids are fully contained.

18. The Discharger is prohibited from conducting post closure land uses over a closed WMU that interferes with the closed WMU’s landfill gas extraction system.

19. The Discharger is prohibited from conducting post closure land uses over a closed WMU where the final closure cover is an ET cover and the proposed post closure land use interferes with the ET cover's ability to prevent infiltration into the Unit.

20. The Discharger shall comply with all Standard Prohibitions listed in Section C of the Standard Provisions and Reporting Requirements (SPRRs) dated December 2015 which are attached hereto and made part of this Order by reference.

B. DISCHARGE SPECIFICATIONS

1. The Discharger shall only discharge the wastes listed in Table 1 below.

Table 1. Waste Acceptance by Waste Management Unit

Title 27 Waste Type	Fill Area 1, Unit 1	Fill Area 1, Unit 2 & Fill Area 2	Class II Surface Impoundments	Solidification Basins
Inert	Yes	Yes	No	Yes
MSW	Yes	Yes	No	No
Non-Hazardous Solid Waste	Yes	Yes	No	Yes
Designated[1]	No	Yes	No	No
Leachate	No	Recirculation[2]	Yes	No
LFG Condensate	No	Recirculation[2]	No[3]	No
Asbestos containing wastes	Yes	Yes	No	No
Treated auto shredder waste	Yes[4]	Yes	No	Yes
Treated Wood Waste	No	Yes	No	No
Non-hazardous liquid and semi-solid wastes[5, 6]	No	No	No	Yes
Additional Liquid Waste[3]	No	No	Yes	No

1. Designated wastes may include commercial and industrial waste, nonhazardous ash, nonhazardous petroleum and/or metal contaminated soils, salty waste, construction and demolition waste, solidified wastes, and dewatered sewage and wastewater treatment plant waste sludge.
2. Leachate and landfill gas condensate recirculation may occur in composite lined modules following Water Board approval as described in Finding 113.
3. The Executive Officer may approve additional liquid waste for disposal in a Class II surface impoundment in accordance with Discharge Specification B.18.
4. Disposal limited to the top lift of Fill Area 1 Unit 1 where the treated auto shredder waste will not be exposed to acidic leachate.
5. Typical liquid-content wastes that may be solidified include: grease trap waste; monitoring well purge water; commercial, industrial or residential waste waters and sludges; rinse waters; and sludges (excluding sewage). The facility can also solidify the sludge that can be generated from the facility's Wastewater Treatment Plant. Currently, the solidification of non-hazardous liquid and semi-solid wastes takes place in clay-lined pits located in the Class II area to prevent rapid infiltration of the discharged liquid waste. Following discharge to the designated area, on-site soils, ash, cement kiln dust, ground wood waste, processed construction and demolition (C&D) debris, non-hazardous contaminated soils, or Treated Auto Shredder Waste (TASW) may be used to solidify any free liquid present in the designated area such that the moisture content of the resulting mixture is not in excess of the waste holding capacity. The Executive Officer may approve the use of additional solidifying agents in the future if a successful demonstration is made regarding the effectiveness of such alternative materials.
6. Notwithstanding the above, no designated waste other than TASW may be used as a solidifying agent in the solidification basins. Additionally, any liquid waste that is solidified must be disposed in a Class II waste management unit.

2. The discharge of a liquid or semi-liquid that will undergo a solidification process must follow Title 27 requirements and SOPs to be developed by WMAC.

3. The Discharger may not use any material as alternative daily cover (ADC) that is not listed as approved ADC in these WDRs unless and until the Discharger has demonstrated that it meets the requirements in Title 27, section 20705, and the Discharger has received approval that it may begin using the material as ADC. The currently approved ADCs are TASW, shredded tires, solidified waste, biosolids (treated sewage sludge), combination biosolids and TASW, geosynthetic blankets and tarps, processed C&D material, material recycling facility (MRF) fines, mixture of TASW and biosolids, and/or geo-synthetic blankets and tarps.

4. The Discharger shall monitor and report the amount of liquid waste including but not limited to liquid waste generated from recycling operations, truck wash facilities, landfill gas-to-energy plants, and vehicle maintenance facilities, applied to each WMU in accordance with intent and purposes listed in Title 27 section 21090(a)(5)(B) for closed WMUs and Title 27 section 20705 for active and inactive WMUs in accordance with the Dischargers MRP R5-2016-0042.

5. The Discharger shall use approved ADC only in internal areas of the landfill that do not drain outside of the limits of the contiguous landfill units unless the Discharger demonstrates that runoff from the particular ADC is not a threat to surface water quality and the demonstration has been approved. This demonstration may take removal of sediment or suspended solids into account for landfills where surface water drains to a sedimentation basin.

6. The Discharger shall notify the Central Valley Water Board staff in accordance with the Discharger's MRP R5-2016-0042 any wastes discharged at this facility in violation of this Order. If the waste is a hazardous waste, the Discharger shall also immediately notify the Department of Toxic Substances Control.

7. Wastes shall be discharged only into waste management units (WMUs) specifically designed for their containment and/or treatment, as described in this Order. Class II landfills shall include liner systems which prevent the movement of fluid, including waste and leachate from the waste management units.

8. A minimum separation of five feet shall be maintained between wastes or leachate and the highest anticipated elevation of underlying groundwater including the capillary fringe, except at Fill Area 1, Unit 2 and Fill Area 2 where minimum separation shall be three feet due to engineered drainage structures (i.e., underdrains) separating wastes (including leachate) from groundwater. If monitoring of the groundwater underdrain system at Fill Area 2 indicates landfill waste constituents have impacted groundwater, the engineered alternative liner design shall be reevaluated for future construction phases of Fill Area 2; the Discharger shall either provide a minimum of five feet of separation between wastes including leachate and groundwater, or propose a new engineered alternative design. Implementation of a new engineered alternative

design will require revision to the WDR and adoption by the Central Valley Water Board.

9. The discharge of waste shall remain within the designated disposal area at all times. The discharge of any waste outside of designated disposal areas is a violation of these WDRs.

10. "Treated wood" wastes may only be discharged to a WMU equipped with a composite liner and leachate collection and removal system, (i.e., WMUs Fill Area 1 Unit 2, and Fill Area 2), as described in Construction Specification D1 and D.2, and only if the wastes are handled in accordance with California Health and Safety Code sections 25143.1.5 and 250150.7.

11. The Discharger shall manage treated wood at the Facility in accordance with California Health and Safety Code sections 25143.1.5 and 25150.7 to ensure consistency and shall comply with all prohibitions listed in Title 22, section 67386.3. The Discharger at a minimum shall monitor the WMUs that receive treated wood waste for arsenic, copper, chromium, and pentachlorophenol, common COCs associated with treated wood, as required in the Discharger's MRP R5-2016-0042. If a release of leachate is verified from the waste management unit where treated wood is disposed, the Discharger shall follow the SPRRs to address the release.

12. Discharge Specifications B.10 and B.11, above, apply only to treated wood waste that is a hazardous waste solely due to the presence of a preservative in the wood, and is not subject to regulation as a hazardous waste under the federal act.

13. Treated wood waste shall not be discharged to landfill cells that have a confirmed leachate release. Treated wood waste shall not be discharged to any landfill cell after confirmation of a release from that cell to either the unsaturated zone or groundwater until corrective action results in cessation of the release.

14. The handling and disposal of friable asbestos-containing wastes at the facility shall be in accordance with all applicable federal and state laws and regulations.

15. All wells within 500 feet of a waste management unit shall have a sanitary seal that meets the requirements of Zone 7 of the Alameda County Flood Control and Water Conservation District prior to the discharge of waste to the unit or the well(s) shall be properly abandoned. A record of the sealing and/or abandonment of such wells shall be sent to the Board and to the Zone 7 water agency.

16. Unsaturated zone monitoring systems shall be capable of measuring both saturated (soil pore liquids or leachate) and unsaturated (soil pore gas or landfill gas) COC concentrations that may exist as a result of a release from the waste management unit.

17. Leachate and landfill gas condensate collected from the landfill WMU (Fill Area 1 and Fill Area 2) shall be discharged in accordance with this Order and either to a

wastewater treatment plant under permit, to a flare system for disposal, to a Class II surface impoundment, or to a composite-lined Fill Area, so long as the receiving Fill Area's LCRS was designed and constructed to accommodate additional leachate and landfill gas condensate flows from other areas of the landfill. Leachate and landfill gas condensate returned to a composite-lined landfill area shall be managed such that it does not cause instability of the waste, does not cause leachate seeps, does not generate additional landfill gas that is not extracted from the landfill by an active landfill gas extraction system, does not cause contaminants to enter surface water runoff, and does not cause leachate volumes to exceed the maximum capacity of the LCRS or violation of Construction Specification D.10 of this Order.

18. The Discharger shall only discharge liquids to a Class II surface impoundment for which the Discharger has shown through an approved water balance that the addition of such liquids will not violate the special requirements for surface impoundments (Title 27 section 20375) and has also shown that the addition of such liquids are compatible with the containment features and other wastes in the WMU. The water balance submitted for the 8-million gallon Class II surface impoundment only included leachate from Fill Area 2, therefore, the only waste approved for discharge to the 8-million gallon Class II surface impoundment is leachate generated from Fill Area 2 Unit 1. The Central Valley Water Board Executive Officer can approve discharge of additional wastes to Class II surface impoundments provided the Discharger provides the required information in this specification.

19. Prior to discharge of waste to a newly constructed phase in Fill Area 2, Unit 1 or Unit 2, the Discharger shall submit a slope stability analysis report based on the anticipated fill sequencing for the new unit as each phase of construction is submitted for review to Staff. The slope stability report will take into consideration but not be limited to saturation of the waste and liner components, the additional weight of saturated waste, and static and dynamic factors of safety required ensuring that slope failure does not occur during fill operations of each phase of construction.

20. The Discharger shall comply with all Standard Discharge Specifications listed in Section D of the SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

C. FACILITY SPECIFICATIONS

1. The Discharger shall comply with all Standard Facility Specifications listed in Section E of the SPRRs dated December 2015 which are attached hereto and made part of this Order.

2. The Discharger shall immediately remove and relocate any hazardous wastes discharged at this facility in violation of this Order. For the unauthorized discharge of hazardous waste (e.g., waste that has not been granted a variance from hazardous waste management requirements pursuant to Health and Safety Code section 25143), the Discharger upon discovery shall immediately notify Central Valley Water

Board staff and DTSC of any violations and provide a schedule for the hazardous waste's removal.

3. For any unauthorized designated waste discharged at this facility in violation of this Order, the Discharger shall immediately notify Central Valley Water Board staff of any violations and provide a schedule for the removal of the unauthorized designated waste in order to prevent leachate generation and a release from unauthorized disposal of waste. If the Discharger is unable to remove and relocate the unauthorized designated waste, the Discharger shall submit a report to the Central Valley Water Board explaining how the discharge occurred, why the unauthorized designated waste cannot be removed, and any updates to the waste acceptance program necessary to prevent re-occurrence.

4. The Discharger shall immediately notify the Central Valley Water 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.

5. Liquid used for facility maintenance shall be limited to the minimum amount necessary for dust control and construction per Title 27 section 20705(f).

6. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.

7. Methane and other landfill gases shall be adequately vented, removed from the Unit, or otherwise controlled to prevent the danger of adverse health effects, nuisance conditions, degradation, or the impairment of the beneficial uses of surface water or groundwater due to migration through the unsaturated zone.

8. Surface drainage within the waste management facility shall either be contained on-site or be discharged in accordance with applicable storm water regulations.

9. The Discharger shall maintain a *Storm Water Pollution Prevention Plan* and *Monitoring Program and Reporting Requirements* in accordance with State Water Resources Control Board Order No. 2014-0057-DWQ, or retain all storm water on-site.

10. In order to ensure that the Facility's waste containment structures have not sustained damage after an earthquake of Magnitude (Mw) 5.0 or greater within 25 miles of the facility or a Magnitude (Mw) 6.0 or greater earthquake within 50 miles of the facility the Discharger shall implement its Post-Earthquake Inspection and Response Plan identified as one of its operations plans in its JTD section 2.7.9 and report the results of the inspection in its MRP R5-2016-0042.

11. The Discharger shall operate an active landfill gas collection and control system in Fill Area 1 and Fill Area 2 in order to control existing impacts to groundwater, and the unsaturated zone. The landfill gas system shall meet the following specifications:

    a. Landfill gas collection and control systems shall be operated to minimize and control air intrusion and to prevent direct venting of the gas to the atmosphere;

    b. Landfill gas collection and control systems shall be operated so that the methane concentration is less than 500 parts per million above background at the appropriate distance above the surface of the landfill necessary to determine regulatory compliance;

    c. There shall be a sufficient number and spacing of horizontal collectors or vertical gas collection wells to control landfill gas migration and emissions; and

    d. No waste may be placed into Fill Area 2 until the Discharger has an approved landfill gas monitoring program and the basal waste containment system where waste will be placed is installed.

SURFACE IMPOUNDMENT SPECIFICATIONS

12. No waste shall be discharged into any new surface impoundments until all applicable financial accounts for these waste management units have been properly funded.

13. At no time shall the freeboard of the Class II surface impoundments be less than two feet. The Class II surface impoundments shall be clearly marked to indicate when liquid levels encroach into the two foot minimum freeboard requirement.

14. Any direct-line discharge to a surface impoundment shall have fail-safe equipment or operating procedures to prevent overfilling.

15. The surface impoundments shall be maintained to prevent scouring and/or erosion of the liner and other containment features at points of discharge to the impoundment and by wind-caused wave action at the waterline.

16. Leachate removed from the secondary containment of the surface impoundments shall be placed back into the surface impoundments.

17. The surface impoundments bottom slope shall be graded to provide positive drainage of LCRS leachate to the leachate sump and ensure unconfined leachate flow in the LCRS drainage layer.

18. If the depth of fluid in an LCRS sump exceeds the level where leachate would back up into the drainage layer, then the Discharger shall immediately cease the discharge of waste (including leachate) to the surface impoundment and shall notify the Central Valley Water Board in writing within seven days. Notification shall include a timetable

for remedial action to repair the upper liner of the impoundment or other action necessary to reduce leachate production.

19. The **Action Leakage Rate** (ALR) for each Class II surface impoundment is **2,000 gallons per acre per day (gpad)** as averaged over a 30-day period. If leachate generation in an LCRS of a Class II surface impoundment exceeds the required ALR, the Discharger shall immediately take steps to locate and repair leak(s) in the liner system and notify the Central Valley Water Board. If repairs do not result in a leakage rate less than the required ALR, the Discharger shall immediately cease the discharge of waste, including leachate, to the surface impoundment and notify the Central Valley Water Board. The notification shall include a timetable for remedial action to repair the upper liner of the surface impoundment or action necessary to reduce leachate production. The ALR for the current 8-million gallon surface impoundment and future 4.6 and 4.8 million gallon surface impoundments are as follows:

Surface Impoundment Volume	**Size (Acres)**	**ALR (Gallons per day)**
8 million gallons	2.5 acres	5000 gallons per day
4.6 million gallons[8]	1 acre[10]	2000[10] gallons per day
4.8 million gallons[10]	1 acre[10]	2000[10] gallons per day

20. The LCRS for each Class II surface impoundment shall be operated and maintained to collect twice the anticipated daily volume of leachate generated by the WMU and to prevent the buildup of hydraulic head on the underlying liner at any time. The depth of fluid in the LCRS sump shall be kept at the minimum needed to ensure efficient pump operation.

21. The LCRS shall be designed and operated to function without clogging through the scheduled closure of the surface impoundments. The surface impoundments shall be equipped to facilitate annual testing to demonstrate proper operation as required by §20340(d) of Title 27.

22. If liquid is detected in a pan lysimeter of a surface impoundment, the Discharger shall:

    a. Immediately sample the liquid for all COCs listed in the Monitoring and Reporting Program.

    b. If a leak is confirmed,

        i. Immediately cease discharge of waste (including leachate) to the surface impoundment until the leaks can be found and repaired.

[8] The volume of these surface impoundments can increase by up to 50% which could affect the surface impoundment size and resulting action leakage rate.

ii. Report to the Central Valley Water Board that the containment structures have failed within 72 hours of the discovery.

iii. Submit written notification of the release to the Central Valley Water Board within seven days and include a time schedule to repair the containment structures.

iv. Discharge of wastes to the surface impoundment shall not resume until the Central Valley Water Board has determined that repairs to the liners are complete and there is no further threat to water quality.

23. The depth of the fluid in the leachate sump of the Class II surface impoundments shall be kept at the minimum needed for efficient pump operation (given the pump intake height and cycle frequency), and leachate shall not back up onto the secondary liner system outside of the sump area.

24. The Discharger shall install storm water diversion structures in accordance with Title 27 section 20365 for each phase of construction in Fill Area 2 in order to prevent inundation of the 8-inch inside diameter leachate conveyance pipe and exceedance of the 1-foot maximum head requirement on the LCRS primary liner 1000-year 24-hour storm event (design storm) falling on the WMUs when waste is initially placed. If portions of the base of each phase will not be covered by waste prior to the wet season to limit the production of leachate, storm water diversion structures shall be in place by 30 September of the initial year of operation of each phase and reported in the Discharger's MRP R5-2016-0042.

25. Leachate generation within a surface impoundment LCRS shall not exceed 85% of the design capacity of (a) the LCRS, or (b) the sump pump. If leachate generation exceeds this value and/or if the depth of the fluid in an LCRS exceeds the minimum needed for safe pump operation, then the Discharger shall immediately cease the discharge of waste (including leachate) to the impoundment and shall notify the Central Valley Water Board in writing within seven days. Notification shall include a timetable for a remedial action to repair the upper liner of the impoundment or other action necessary to reduce leachate production.

26. Sediment or solids that accumulate in the Class II surface impoundments shall be removed when necessary to maintain the designed storage capacity. Sludge and solids removal shall be accomplished in a manner that ensures the continued integrity of liners and leachate collection systems in accordance with the facility's operations plan. Prior to disposal of these solids, sufficient samples shall be taken for their characterization and classification pursuant to Title 27. The Discharger shall submit a workplan and schedule to Central Valley Water Board staff at least 90 days prior to removal of the waste that includes the waste characterization and how the Discharger plans to dispose of the sludge and solids.

27. Following sediment/solids removal from the Class II surface impoundments, the liner system shall be inspected for any damage caused by the process of removing the

sediment/solids and any damage shall be repaired within 60 days prior to the discharge of additional wastewater. The Discharger shall submit a final report describing the results of the leak testing to Central Valley Water Board staff..

D. CONSTRUCTION SPECIFICATIONS

LANDFILL LINER SYSTEM COMPONENTS

1. The Discharger shall construct the approved composite bottom liner system in Fill Area 2. The composite liner system shall consist of, from top-to-bottom, the following:

   a. A minimum 12-inch thick operations layer with minimum hydraulic conductivity of greater than 1 x 10^{-4} cm/sec[9];
   b. A 8 ounce/yard^2 geotextile separator
   c. A minimum one-foot thick granular LCRS layer
   d. A geotextile cushion layer if needed[10];
   e. A textured 60-mil thick HDPE geomembrane, or equivalent;
   f. A minimum two-foot compacted low-permeability soil layer[11];
   g. A minimum one-foot compacted general earth fill layer (wetted footprint[12] area only);
   h. A 8 ounce/yard^2 geotextile separator (wetted footprint area only) ;
   i. A minimum one-foot thick groundwater subdrain gravel layer (wetted footprint area only);
   j. A 8 ounce/yard^2 geotextile separator (wetted footprint area only); and
   k. Prepared subgrade.

2. The Discharger shall construct the approved composite side slope liner[13] system in Fill Area 2. The side slope liner shall consist of, from top-to-bottom, the following:

   a. A minimum 24-inch thick operations layer with minimum hydraulic conductivity of greater than 1 x 10^{-4} cm/sec[11];
   b. A geocomposite drainage layer LCRS;
   c. A 60-mil HDPE geomembrane;

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[9] As an alternative, the Discharger may use a sufficient number of gravel drainage windows within the operations layer properly placed to achieve the minimum hydraulic conductivity requirement in order to ensure that leachate is able to percolate through the operations layer.

[10] The thickness of the geotextile cushion layer, if needed, shall be specified based on the LCRS granular size and physical characteristics (rounded, semi-rounded, etc.) in order to prevent damage to the primary geomembrane from static and dynamic loads.

[11] The Discharger's current test pad results per Title 27 section 20324(g) determined that the on-site clay source materials required addition of 3% by weight of bentonite in order to meet the maximum 1 x 10^{-7} cm/sec hydraulic conductivity requirements of State Water Board Resolution 93-62. The need for and percentage of bentonite admix may be modified based on additional soil source characterization and additional test pad results.

[12] Wetted footprint includes capillary fringe.

[13] The Discharger has defined the side slopes of Fill Area 2 to include the side slope benches and any sloped areas greater than 8%.

d. A two-foot compacted low-permeability soil layer or GCL that is equivalent to a minimum of 2-foot of compacted soil that has a hydraulic conductivity of no more than 1 x 10^{-7} cm/sec;
e. A one-foot compacted general earth fill layer (wetted footprint area only);
f. A double-sided subdrain drainage geocomposite (wetted footprint area only); and
g. Prepared subgrade.

CLASS II SURFACE IMPOUNDMENT LINER SYSTEM

3. The surface impoundment base liner system for the Class II surface impoundments shall consist of the following layers from the top-to-bottom:

   a. 1 foot gravel operations layer (optional);
   b. 60-mil-thick HDPE Primary Geomembrane;
   c. HDPE Geonet (and LCRS gravel in the sump);
   d. 40-mil HDPE Secondary Geomembrane;
   e. Geosynthetic Clay Liner (GCL) that is equivalent to a minimum of 2-foot of compacted soil that has a hydraulic conductivity of no more than 1 x 10^{-7} cm/sec;
   f. Single Sided Geocomposite and gravel in the pan lysimeter under sump;
   g. 40-mil HDPE geomembrane (part of pan lysimeter liner under sump)
   h. 4-inch select soil liner bedding (unless native soils are sufficiently graded to provide appropriate liner bedding; and
   i. Suitable subgrade.

4. The surface impoundment side slope liner system for the Class II surface impoundments shall consist of the following layers from the top-to-bottom:

   a. 40-mil sacrificial HDPE geomembrane (where deemed necessary);
   b. 60-mil-thick HDPE Primary Geomembrane;
   c. HDPE Geonet;
   d. 40-mil HDPE Secondary Geomembrane;
   e. GCL that is equivalent to a minimum of 2-foot of compacted soil that has a hydraulic conductivity of no more than 1 x 10^{-7} cm/sec;
   f. 4-inch select soil liner bedding (unless native soils are sufficiently graded to provide appropriate liner bedding; and
   g. Suitable subgrade.

5. The surface impoundments and related containment structures shall be constructed and maintained to prevent, to the greatest extent possible, inundation, erosion, slope failure, washout, and overtopping under 1,000-year, 24-hour precipitation conditions, and shall be designed to contain the 100-year wet season precipitation without using the required two feet of freeboard.

GENERAL CONSTRUCTION SPECIFICATIONS

6. The Discharger may propose changes to the liner or closure cover system design prior to construction, provided that approved components are not eliminated, the

engineering properties of the components are not substantially reduced, and the proposed liner or closure cover system results in the protection of water quality equal to or greater than the design prescribed by Title 27 and this Order. The proposed changes may be made following approval by the Executive Officer. Substantive changes to the design as determined by the Executive Officer require reevaluation as an engineered alternative and approval by the Central Valley Water Board.

7. Materials used to construct LCRSs shall have appropriate physical and chemical properties to ensure the required transmission of leachate over the life of the waste management unit and the post-closure maintenance period.

8. During construction (if necessary) and following the completion of construction of any Unit (including the Class II surface impoundments) or portion of a Unit, the Discharger shall conduct a leak detection test. This test will be completed on both primary and secondary geomembranes of a Class II surface impoundment. In the case of a landfill WMU, one test will be completed on either (1) the primary geomembrane layer of the floor or base containment system and the side-slope areas, or (2) on the floor or base containment system including the side slope areas after the installation of the LCRS, overlying operations layer, and gravel windows (if gravel windows are required). The Discharger shall use the protocol outlined in ASTM standard 7007, or other equivalent standard. Any defects found shall be identified and repaired accordingly.

9. All WMU(s) with an LCRS component shall be constructed with a means to perform the annual LCRS test required in Title 27 section 20340(d).

10. The Discharger shall, design, construct, operate, and maintain an adequate underdrain drainage network below Fill Area 1 Unit 2 and Fill Area 2 in order to satisfy the approved engineered alternative to the 5-foot separation requirements of Title 27 section 20240(c) for all areas of the WMU where groundwater does not meet the 5-foot separation requirement. The approved engineered alternative to the 5-foot separation requirements of Title 27 does not apply to Class II surface impoundments at the Facility. The Discharger must maintain 5-foot groundwater separation including the capillary fringe without the use of an underdrain drainage network below the Class II surface impoundments.

11. The Discharger shall, design, construct, operate, and maintain an adequate leak detection system below the main collector trench for each phase of construction in Fill Area 2 (does not apply to Class II surface impoundments).

12. The Discharger shall remove any known historical landslides within the footprint of the Fill Area 2 to provide a foundation that complies with Title 27 section 20240(d) and 21750(f)(5). If new landsides are unearthed during construction, such deficiencies will be mapped and removed. If the Discharger proposes to not remove any landslide within the Fill Area 2 footprint the Discharger shall submit a risk analysis report including a revised slope stability analysis report comparing the cost benefit for not removing the landslide versus the cost of repairing the landfill liner if it were to fail

during the Unit's life, closure period, and post-closure maintenance period due to the identified landslide not being removed.

CLOSURE CONSTRUCTION SPECIFICATIONS

13. For the remaining unclosed area of Fill Area 1, Unit 1, the Discharger shall install the proposed engineered alternative evapotranspirative (ET) cover described below and as proposed in the Discharger's December 2008 *Alternative Final Cover Design Report* (from bottom to top):

    a. 2-feet of compacted soil

    b. 2-feet of soil placed loosely at below optimum moisture; and

    c. A vegetative cover selected to maximize removal of moisture from the cover.

14. This Order requires the Discharger to construct the 10-acre ET Demonstration Project by December 2017, monitor the effectiveness of the ET cover from 2018 to 2022, submit an updated plan to address closure of Fill Area 1 over the next ten years in 2023, and to initiate closure operations in 2023.

15. The Discharger shall submit a monitoring for the alternative ET cover to demonstrate its effectiveness in isolating the waste from precipitation. The demonstration shall verify that the performance objectives described in the 2008 Alternative Final Cover Design Report, Fill Area 1–Partial Unit 1 and Unit 2, ALRRF (Dwyer, Valceschini, and Obereiner, December 2008) has been met for use on unlined Fill Area 1 Unit 1 prior to its use over the entire area of Fill Area 1 Unit 1.

16. If the Discharger proposes to use the ET cover design on lined Fill Area 1 Unit 2 and lined Fill Area 2 Unit 1, the Discharger shall demonstrate that the ET cover meets the performance objectives described in the 2008 AFC Design Report and provides correspondingly low through-flow rate per Title 27 regulations. If the cover fails to isolate the waste from precipitation, the contingency plan will be implemented.

17. For Fill Area 1, Unit 2 and Fill Area 2 at the landfill, where the final cover system is not an ET Cover, the final cover system shall consist of, from top-to-bottom, the following:

    a. A one-foot vegetative layer comprised of suitable soils;
    b. A synthetic drainage layer (e.g., geonet) overlain by a geotextile material;
    c. A flexible membrane liner (FML) consisting of a minimum 60-mil HDPE cover;
    d. A low-permeability layer of compacted fine grained soils or GCL equivalent, which will yield an equivalent low flow-through rate of $1x10^{-7}$ cm/sec or less with a minimum thickness of 1 foot of low permeability soil; and
    e. A two-foot foundation layer comprised of soils, which may include non-hazardous impacted Class II soils.

18. At closure, the Discharger must initiate an effort to clean close the Class II surface impoundments. If clean closure is infeasible, the surface impoundments shall be closed as a landfill. The Discharger must submit a clean closure plan at least 180 days prior to clean closure of a Class II surface impoundment.

19. Prior to closure, the Discharger shall submit a Final Closure Plan or Partial Final Closure Plan for review and approval for the Unit or portion of the Unit to be closed at least 2 years prior to the anticipated date of closure. The Discharger shall also submit a Post-Closure Maintenance Plan at least 2 years prior to the anticipated date of closure.

20. The Discharger shall not proceed with construction until the construction plans, specifications, and all applicable construction quality assurance plans have been approved. The Discharger must allow Central Valley Water Board staff at least 120 days for review and approval of these documents unless the Discharger chooses to proceed at its own risk.

21. The Discharger shall comply with all Standard Construction Specifications listed in Section F of the SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

22. The Discharger shall comply with all Storm Water Provisions listed in Section L of the SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

E. CLOSURE AND POST-CLOSURE MAINTENANCE SPECIFICATIONS

1. The Discharger shall submit a final or partial final closure and post-closure maintenance plan prior to proposed closure of any portion of the landfill in accordance with requirements in Section G of the Standard Closure and Post-Closure Specifications in the SPRRs. For Fill Area 1 the Discharger shall submit a final closure and post-closure plan in accordance to the schedule provided in Provisions H.8.

2. The Discharger shall close landfill Units with a final cover as approved by this Order, or as approved by the Executive Officer. The components of the approved final cover are listed in Construction Specifications D.20 through D.23 above.

3. The Discharger shall close the landfill with side slopes at steepness of 3H:1V or less, unless the Discharger provides a slope stability analysis that complies with Title 27 requirements that supports steeper slopes. The top deck areas are required to maintain minimum of three percent grade and maintain positive drainage.

4. The Discharger shall close Fill Area 1 with side slopes that include at a minimum 15-foot wide benches every 50 vertical feet except in areas side slopes have already been constructed with 10-foot benches at the time of adoption of these WDRs and the Discharger has indicated that the narrower bench will not prevent the Discharger from

performing post closure maintenance in these areas. 15-foot wide benches every 50 vertical feet are required in Fill Area 2 unless a slope stability analysis shows that wider benches are necessary. The current slope stability analysis shows that 20-foot wide benches are required every 50 vertical feet.

5. Landfill gas shall be extracted from closed landfill Units until such time that the landfill gas is no longer a threat to water quality as documented by the Discharger and approved by the Executive Officer.

6. For closure with a final cover that includes a geomembrane, the Discharger shall seal the edges of the final cover by connecting the cover geomembrane to the liner geomembrane (applicable to Fill Area 1 Unit 2 WMU and Fill Area 2 WMU).

7. The Discharger shall test the critical interfaces of the final cover in a laboratory to ensure minimum design shear strengths are achieved and include the results in the final documentation report.

8. The Discharger shall ensure that the vegetative/erosion resistant layer receives necessary seed, binder, and nutrients to establish the vegetation proposed in the final closure plan. The Discharger shall install necessary erosion and sedimentation controls to prevent erosion and sediment in runoff from the closed landfill during the period the vegetation is being established.

9. The Discharger shall comply with all Standard Closure and Post-Closure Specifications listed in Section G and all Standard Construction Specifications that are applicable to closure in Section F of the SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

10. Pursuant to Title 27, section 21090(e)(1), the Discharger shall survey of the final cover following closure activities for later comparison with iso-settlement surveys required to be conducted every five years.

11. Pursuant to Title 27, section 21090(e)(2) the Discharger shall once every five years during the post-closure maintenance period, prepare aerial photographic maps of the closed landfill area to identify and evaluate landfill settlement. The Discharger will prepare iso-settlement maps to determine the amount of differential settlement occurring over the previous five years.

12. Pursuant to California Code of Regulations, Title 17, section 95471(c) and Title 27, section 21090(a)(4)(A) the Discharger shall carry out periodic monitoring of the integrity of the low-hydraulic-conductivity layer, including a method for effectively identifying and repairing breaches in that layer. Defects will be repaired and tested for adequacy based on the closure CQA Plan.

F. FINANCIAL ASSURANCE SPECIFICATIONS

1. The Discharger shall obtain and maintain assurances of financial responsibility with CalRecycle for closure and post-closure maintenance for all Units at the landfill in at least the amounts described in the Financial Assurance section above, and as adjusted for inflation annually. A report regarding financial assurances for closure and post-closure maintenance shall be submitted to the Central Valley Water Board by **1 June of each year**. This may be the same report that is submitted to CalRecycle for this purpose. If CalRecycle determines that either the amount of coverage or the mechanism is inadequate, then within 90 days of notification, the Discharger shall submit an acceptable mechanism to CalRecycle and the Central Valley Water Board for at least the amount of the approved cost estimate.

2. The Discharger shall update the preliminary closure and post-closure maintenance plan (PCPCMP) any time there is a change that will increase the amount of the closure and/or post-closure maintenance cost estimate. The updated PCPCMP shall be submitted to the Central Valley Water Board, the Local Enforcement Agency, and CalRecycle. The PCPCMP shall meet the requirements of Title 27, section 21769(b), and include a lump sum estimate of the cost of carrying out all actions necessary to close each Unit, to prepare detailed design specifications, to develop the final closure and post-closure maintenance plan, and to carry out the first thirty years of post-closure maintenance. Reports regarding financial assurance required in F.1 above shall reflect the updated cost estimate.

3. The Discharger shall obtain and maintain assurances of financial responsibility with CalRecycle for initiating and completing corrective action for all known or reasonably foreseeable releases from the landfill in at least the amount of the annual inflation-adjusted cost estimate described in the Financial Assurances section above.

4. The Discharger shall maintain cost estimates and funding for initiating and completing corrective action for all known or reasonably foreseeable releases from **Fill Area 1**, each unit of **Fill Area 2** prior to discharge of waste, and the Class II surface impoundments prior to discharge of waste.

5. Pursuant to Title 27, section 22221, the Discharger shall obtain and maintain financial assurances for corrective action of all known or reasonably foreseeable releases for **Fill Area 1** in at least the amount of the approved cost estimate.

6. Pursuant to Title 27, section 22221, the Discharger shall submit a cost estimate and proposed financial assurance mechanism to the Central Valley Water Board for corrective action for a reasonably foreseeable release for each unit of **Fill Area 2**, prior to discharge, meeting the requirements of Title 27, chapter 6. Once approved, the Discharger shall establish an irrevocable fund for corrective action financial assurance with the CIWMB **prior to discharge** to each Unit.

7. Pursuant to Title 27, section 22222, the Discharger shall submit a cost estimate and proposed financial assurance mechanism to the Central Valley Water Board for corrective action of all reasonably foreseeable releases from the **Class II surface impoundments**. Once approved, the Discharger shall establish an irrevocable fund for corrective action financial assurance with the Central Valley Water Board using the approved mechanism, in the amount of the approved cost estimate, and naming the "CIWMB" as beneficiary, **prior to discharge** to the units.

8. A report regarding financial assurances for corrective action shall be submitted to the Central Valley Water Board by **1 June of each year**. The report shall demonstrate that the financial assurance fund for corrective action for **Fill Area 1** has been updated in accordance with the fund balance calculations provided in Section 22226 of Title 27. The report shall also demonstrate that the financial assurance fund for a reasonably foreseeable release from **Fill Area 2** has been updated in accordance with the fund balance calculations provided in Title27, section 22226. The report shall also demonstrate that the financial assurance fund for a reasonably foreseeable release from all **Class II surface impoundments** has been updated in accordance with the fund balance calculations provided in Title 27, section 22226. This may be the same report that is submitted to CalRecycle for this purpose. If CalRecycle determines that either the amount of coverage or the mechanism is inadequate, then within 90 days of notification, the Discharger shall submit an acceptable mechanism to CalRecycle and the Central Valley Water Board for at least the amount of the approved cost estimate.

9. The Discharger shall comply with all Standard Financial Assurance Specifications listed in Section H of the SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

G. MONITORING SPECIFICATIONS

1. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, and in accordance with Monitoring and Reporting Program (MRP) R5-2016-0042, and the Standard Monitoring Specifications listed in Section I of the SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

2. The Discharger shall, for any landfill Unit in a corrective action monitoring program, comply with the corrective action monitoring program provisions of Title 27, MRP R5-2016-0042, and the Standard Monitoring Specifications listed in Section I of SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

3. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, MRP R5-2016-0042, and the SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

4. The concentrations of the constituents of concern in waters passing the Point of Compliance (defined pursuant to Title 27, section 20164 as a vertical surface located at the hydraulically downgradient limit of the landfill Unit that extends through the uppermost aquifer underlying the Unit) shall not exceed the concentration limits established pursuant to MRP R5-2016-0042.

5. Fill Area 2 will be filled in stages; a detection monitoring well shall be installed at the downgradient edge of each phase. As a result, the footprint of the waste management unit will expand over time. The Discharger must develop and implement a plan that will ensure there will be a groundwater monitoring well at the downgradient edge of the waste throughout the life of the facility.

6. The Discharger shall monitor the underdrain, LCRS, and leak detection system associated with each phase of construction in Fill Area 2 Unit 1. The liquid shall be collected as close to edge of waste as possible for each phase of construction in order to provide representative samples.

7. The Discharger shall monitor and report all liquid waste generated at the proposed MRF Facility (if constructed) that is classified as non-hazardous waste or designated waste in accordance with MRP R5-2016-0042.

8. For each monitoring event, the Discharger shall determine whether the landfill is in compliance with the Water Quality Protection Standard using procedures specified in MRP R5-2016-0042 and the Standard Monitoring Specifications in Section I of the SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

9. The Discharger shall evaluate as part of its Corrective Action Monitoring Program the effectiveness of its corrective action program and provide as part of its reporting requirements an estimate as to when the Discharger will achieve full compliance.

10. The Discharger shall add any confirmed COCs detected during its 5-year monitoring schedule using Tables V and VI of MRP R5-2016-0042 for detection monitoring purposes, as appropriate based upon consideration of laboratory false-positives, the repeatability of detections and the effectiveness of a particular COC in providing early indication of a potential release.

11. The Discharger shall comply with all Standard Monitoring Specifications and Response to a Release specifications listed in Sections I and J of the SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

H. PROVISIONS

1. The Discharger shall maintain a copy of this Order at the facility, including the MRP R5-2016-0042 and the SPRRs dated December 2015 which are part of this Order,

and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.

2. A copy of all documents submitted to the Central Valley Water Board shall be maintained in the facility's operating record.

3. The Discharger shall comply with all applicable provisions of Title 27 and Subtitle D that are not specifically referred to in this Order.

4. The Discharger shall comply with MRP R5-2016-0042, which is incorporated into and made part of this Order by reference.

5. The Discharger shall comply with the applicable portions of the Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Subtitle D and/or Title 27, dated January 2012, which are attached hereto and made part of this Order by reference.

6. If there is any conflicting or contradictory language between the WDRs, the MRP, or the SPRRs, then language in the WDRs shall supersede either the MRP or the SPRRs, and language in the MRP shall supersede the SPRRs.

7. All reports required by this Order shall be submitted pursuant to Water Code section 13267, and shall be prepared under the direction of, and certified by a registered professional competent to take responsible charge over the required report.

8. The Discharger shall complete the tasks contained in these waste discharge requirements and submit the following reports pursuant to Water Code section 13267 in accordance with the following time schedule:

Task	Compliance Date
a. Closure of Fill Area 1: The Discharger shall:	
1. By **15 April 2017**, provide a technical report, work plan, and schedule (including a final closure and post-closure maintenance plan) to install and maintain an ET final closure cover over Fill Area 1 Unit 1. The schedule shall include incremental closure of Fill Area 1 Unit 1 such that installation of the approved ET final closure cover over all of Fill Area 1 Unit 1 is initiated by 1 August 2023.	**15 April 2017**
2. By **1 December 2017** install the approved 10-acre ET final closure cover over Fill Area 1 and ET final closure cover performance monitoring system to begin the 4-year demonstration period.	**1 December 2017**
3. By **15 April 2018**, the Discharger shall submit the final CQA report for the construction and installation of the 10-acre ET final closure cover and leakage low through-flow rate monitoring system.	**15 April 2018**
4. By **1 April 2023**, submit a Technical Report including a workplan that shall include the results of the four-year monitoring period and determination whether the proposed ET cover system complies with Title 27, and if it is proposed to be used on Fill Area 1 Unit 2 and/or Fill Area 2 Unit 1.	**1 April 2023**
b. Evaluate Effectiveness of the Groundwater Detection Monitoring Program: The Discharger shall:	
1. **Submit a technical report** that considers the adequacy of the existing monitoring well network for Fill Area 1 and 2, and identifies if additional monitoring wells are necessary for detection monitoring in accordance with Title 27 section 21760(a)(3), and assess the adequacy of the current Sample Collection and Analysis Plan (SAP);	**15 December 2016**
2. If additional monitoring wells are considered	

Task	Compliance Date
necessary, **submit a workplan** to install the monitoring wells within **60 days** of Water Board staff approval of the Technical Report, and **implement the approved workplan** for well installation within **90 days** of workplan approval; and 3. **Submit Final Documentation** for groundwater monitoring well installation completion and revised SAP within **90 days** of well installation.	
c. Evaluate Compliance of Solidification Activities with Title 27 Requirements: 1. Provide Standard Operating Procedures for the solidification process at ALRRF. 2. **Submit a technical report** to demonstrate that solidification operations do not result in the introduction of liquids into a solid waste WMU in excess of the moisture holding capacity of the WMU as a result of waste management operations, compaction, or settlement.	**30 September 2016** **1 April 2017**
d. Discharges of COCs to Storm Water Detention Basins: The Discharger shall: 1. **Submit a work plan and implementation schedule** that complies with Title 27 section 20430 that investigates the source of COCs that have been periodically discovered in storm water detention basins. The work plan shall include an accelerated monitoring schedule for at least one year (e.g., quarterly monitoring or more frequently to determine the sources of VOCs); 3. **Implement work plan** including accelerated monitoring schedule; and 4. **Submit Technical Report** including source control methods, operation and maintenance and best management practices to prevent release of COCs to storm water detention basins.	**1 December 2016** **1 March 2017** **30 June 2018**

Task	Compliance Date
e. Expansion of the unsaturated zone monitoring system for Fill Area 1 and Fill Area 2: The Discharger shall:	
1. **Submit a workplan, updated sample collection and analysis plan, and schedule** for installation of soil-pore gas monitoring devices in the unsaturated zone that complies with Title 27 section 21760(a)(3) and section 20430 (for corrective action purposes) at the edge of waste for Fill Area 1 Unit 1 in the vicinity of point of compliance monitoring wells E-05, E-07, and E-20B and in Fill Area 1 Unit 2 in the vicinity at the edge of waste closest to the underdrain collection sump (VD2) and underlying pan lysimeter (VZM-A) to monitor the effectiveness of the landfill gas extraction system as a corrective action measure. The workplan shall also include installation of soil-pore gas monitoring devices at the edge of waste closes to the LCRS collection point for each phase of construction of Fill Area 2 where a pan lysimeter is not being used to monitor the unsaturated zone to determine if gas containing VOCs is being released from the Unit;	**28 February 2017**
2. **Implement workplan** for installation of soil-pore gas monitoring devices; and	**30 April 2017 or 60 days after Water Board staff approval**
3. **Submit Final Documentation** regarding installation completion of soil-pore gas monitoring devices.	**31July 2017 or 60 days after completion of work**
f. Monitoring of underdrains, leachate, and leak detection systems nearest the edge of waste for each phase of construction in Fill Area 2: The Discharger shall submit an updated sample collection and analysis plan, and schedule monitoring and reporting of liquid collected in the underdrain, LCRS, and leak detection system associated with each phase of construction in Fill Area 2 Unit 1. The liquid shall be collected as close to edge of waste as possible for each phase of	**1 August 2016 for Phase 1 and at least 120 days prior to discharge for each future phase of construction**

Task	Compliance Date
construction in order to provide representative samples.	
g. Submit Water Quality Protection Standards for the Class II Surface Impoundment that complies with Title 27 section 20390. The Discharger shall receive Water Board staff approval prior to the discharge of waste.	**30 days prior to discharge**
h. Groundwater Monitoring for each phase of construction in Fill Area 2: 1. The Discharger shall submit a work plan(s) that complies with Title 27 section 21760(a)(3) to install groundwater monitoring wells for Fill Area 2 to complete well installation and required initial sampling prior to placement of waste in the corresponding units. The work plan(s) shall propose monitoring wells for the following areas: i. In the weathered zone at the intersection of the northern extent of Fill Area 2 and the West Fault. ii. At the downgradient edge of each module with appropriate spatial distribution to provide sufficient number of POC wells and piezometers to establish groundwater flow and direction of Fill Area 2 as the area expands into the permitted landfill footprint. 2. The Discharger shall submit a well installation report. Prior to discharge to new phases of construction (modules) in Fill Area 2, the Discharger shall submit a Water Quality Protection Standard that complies with Title 27 section 20390 for detection monitoring wells based on un-impacted background groundwater data.	**15 December 2016** **Within 30 days after installation of the wells.** **At least 90 days prior to discharge**

i. Groundwater Monitoring for Future Class II Surface Impoundments:	
1. The Discharger shall submit a work plan proposing a monitoring program that complies with Title 27 section 21760(a)(3) for each Class II surface impoundment.	**At least 2 years** prior to placement of waste in order to establish background water quality
2. Within 30 days after installation of a monitoring well network (if applicable), the Discharger shall submit a monitoring well network installation report.	**Within 30 days** after installation of monitoring network.
3. Prior to discharge to the Class II surface impoundments, the Discharger shall submit a Water Quality Protection Standard that complies with Title 27 section 20390 for detection monitoring based on un-impacted background data.	**At least 90 days** prior to discharge.
j. Water Quality Protection Standards (WQPS) and Concentration Limits Technical Report: The Discharger shall:	
1. Submit a WQPS and concentration limits Technical Report that complies with Title 27 section 20390 for each Unit that shall clearly indicate the concentration limits for each compliance point and for each monitored medium i.e. ground water, surface water, unsaturated zone. The WQPS shall contain a sample collection and analysis plan that complies with Title 27 sections 20415(e)(4)-(5).	**Prior to placement of waste in a newly constructed WMU**

k. Groundwater seeps/springs within one mile of the drainage basins downgradient of Fill Area 1 and Fill Area 2 :	
1. By **1 September 2017** the Discharger shall conduct a survey that complies with Title 27 section 21750(g)(5) within one mile of the WMU boundaries at times when groundwater seeps/springs are most likely to be evident and prepare and submit a technical report identifying all seeps/springs that have the potential to contain groundwater that may have originated and/or flowed from below a WMU.	**1 September 2017**
2. Based on the results of this survey, the Discharger shall include seeps/springs as identified by Water Board staff in the approved technical report into its (MRP) R5-2016-0042 for monitoring and reporting purposes.	Immediately following Central Valley Water Board staff approval.
l. Management of Fill Area 1 Unit 1 leachate LCRS (LS) flows from non-leachate Valley Underdrain (VD) flows. The Discharger shall:	
1. **Submit a workplan and schedule** for managing liquids collected from the Unit 1 LCRS as leachate and the non-leachate valley underdrain for the purpose of proper waste disposal in accordance with Title 27 section 20200(d) requirements;	**1 July 2017**
2. **Implement workplan** for managing the two sources as leachate and non-leachate liquid waste; and	**1 July 2018**
3. **Submit Final Documentation** for completion of changes necessary to manage the two sources of liquid waste consistent with Title 27 requirements.	**1 February 2019**
m. Financial Assurances for Class II Surface Impoundments:	
The Discharger shall revise its preliminary closure plan to include clean closure of any constructed Class II surface impoundment. The preliminary closure plan shall include a cost estimate for clean closure. The Discharger shall provide financial	**Prior to discharge of waste into any Class II surface impoundment**

	assurances for clean closure of any constructed Class II surface impoundment and include financial assurances for corrective action costs due to all known or reasonably foreseeable releases from any constructed Class II surface impoundment prior to initiating its operation.	
n.	**Final Construction Report:** Prior to discharge to any newly constructed WMU phase in Fill Area 2, or discharge to any newly constructed Class II surface impoundments, or discharge to any existing WMU where the containment system was repaired or replaced, the Discharger shall submit a final construction report that contains all information concerning the placement of the containment system. These reports shall provide information demonstrating that the CQA plan was implemented as proposed and that the construction proceeded in accordance with design criteria, plans, and specifications. The Discharger shall submit copies of the Final Documentation report to the Central Valley Water Board staff as prepared by the CQA officer for approval. The Discharger must receive approval of the construction before the use of the Unit commences (Title 27 section 20310(e)).	**At least 90 days** prior to the projected date to commence discharge.

9. The Discharger shall comply with all General Provisions listed in Section K of the SPRRs dated December 2015 which is incorporated into and made part of this Order by reference.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that this Order is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 24 February 2017, and amended by Order R5-2017-0026 on 24 February 2017.

Original signed by

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PAMELA C. CREEDON, Executive Officer

WMH