CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

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Regional Board Website (https://www.waterboards.ca.gov/centralvalley)

WASTE DISCHARGE REQUIREMENTS ORDER R5-2022-0047

ORDER INFORMATION

Order Type(s):	Waste Discharge Requirements (WDRs)
Status:	ADOPTED
Program:	Title 27 Discharges to Land
Region 5 Office:	Sacramento
Discharger(s):	Recology
Facility:	Recology Hay Road Landfill and Jepson Prairie Organics
Address:	6426 Hay Road, Vacaville, CA 95687
County:	Solano County
Parcel Nos.:	42-020-02, 42-020-06, 42-020-28
WDID:	5A480300001
Prior Order(s):	R5-2016-0056

CERTIFICATION

I, PATRICK PULUPA, Executive Officer, hereby certify that the following is a full, true, and correct copy of the order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 10 June 2022.

PATRICK PULUPA,
Executive Officer

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GLOSSARY

ADC .....Alternative Daily Cover

Antidegradation Policy .....Statement of Policy with Respect to Maintaining High Quality Waters in California, State Water Board Resolution 68-16

Basin Plan.....*Water Quality Control Plan for the Sacramento and San Joaquin River Basins*

bgs.....Below Ground Surface

BOD .....Biological Oxygen Demand

C-Soil.....Contaminated Soil

C&D .....Construction and Demolition Materials

CalRecycle.....California Department of Resources Recovery and Recycling

CAP.....Corrective Action Program

CAMP.....Corrective Action Monitoring Program

CC……...Compacted Clay

CCL……Compacted Clay Liner

CEQA.....California Environmental Quality Act

CEQA Guidelines.....California Code of Regulations, Title 14, section 15000 et seq.

C.F.R......Code of Federal Regulations

COCs .....Constituents of Concern

CPMP.....Closure and Post-Closure Maintenance Plan

CQA .....Construction Quality Assurance

Designated Waste .....(a) Hazardous Waste subject to variance from management requirements per Health and Safety Code section 25143; and (b) Nonhazardous Waste containing pollutants that, under ambient conditions, could be released in concentrations exceeding applicable WQOs, or that could reasonably be expected to affect beneficial uses of water. (Wat. Code, § 13173.)

DMP .....Detection Monitoring Program

DTSC .....California Department of Toxic Substances Control

DWR.....California Department of Water Resources

EC .....Electrical Conductivity

EIR .....Environmental Impact Report

EMP .....Evaluation Monitoring Plan

Est. .....Estimated

FEMA.....Federal Emergency Management Agency

GCL.....Geosynthetic Clay Liner

Hazardous Waste .....Wastes which, pursuant to Title 22, section 66261.3 et seq., are required to be managed in accordance with Division 4.5 of Title 22. (Title 27, § 20164; Title 23, § 2521(a).)

HDPE .....High-Density Polyethylene

JTD .....Joint Technical Document

LC-Soil.....Lead Contaminated Soil

LCRS .....Leachate Collection and Removal System

LDS…….Leak Detection System, sometimes called a Secondary LCRS

LEA.....Local Enforcement Agency

Leachate.....Liquid formed by the drainage of liquids from waste or by the percolation or flow of liquid through waste. Leachate includes any constituents extracted from the waste and dissolved or suspended in the fluid. (Title 27, § 20164.)

LFG.....Landfill Gas

MCE.....Maximum Credible Earthquake

MDB&M.....Mount Diablo Base and Meridian

MDL.....Method Detection Limit

µg/L.....Micrograms per Liter

mg/L.....Milligrams per Liter

MPE.....Maximum Probable Earthquake

msl.....Mean Sea Level

MRP.....Monitoring and Reporting Program

MSW.....Municipal Solid Waste regulated under 40 C.F.R. part 258

MSWLF.....Municipal Solid Waste Landfill

MW.....Monitoring Well

NAVD 88.....North American Vertical Datum of 1988

NGVD 29.....National Geodetic Datum of 1929

SPRRs.....Standard Provisions and Reporting Requirements

Subtitle D.....USEPA-promulgated MSW regulations under RCRA (see 40 C.F.R. part 258)

RCRA.....Resource Conservation and Recovery Act

ROWD.....Report of Waste Discharge

TDS.....Total Dissolved Solids

Title 22.....California Code of Regulations, Title 22

Title 23.....California Code of Regulations, Title 23

Title 27.....California Code of Regulations, Title 27

USEPA.....United States Environmental Protection Agency

VOCs .....Volatile Organic Compounds

WDRs.....Waste Discharge Requirements

WMU .....Waste Management Unit

WQOs .....Water Quality Objectives

WQPS .....Water Quality Protection Standard

FINDINGS

The Central Valley Regional Water Quality Control Board (Central Valley Water Board) hereby finds as follows:

Introduction

1. Recology Inc. (Discharger) owns and operates the Recology Hay Road Landfill and Jepson Prairie Organics (Facility), which is located approximately 10 miles south of the City of Dixon in Solano County, Section 2, Township 5 North, Range 1 East, Mount Diablo Base and Meridian (MDB&M). The geographic coordinates of the site are Latitude 38.312 north, Longitude -121.837 west. The Facility's location is depicted on the Site Location Map in **Attachment C**. The address associated with the Facility is 6426 Hay Road, Vacaville, California 95687.

2. The Facility is situated on a 640-acre property comprised of Assessor's Parcel Numbers (APNs) 42-020-02, 42-020-06, 42-020-28.

3. The landfill facility has been in operation since 1964, accepting household, commercial, industrial, construction and demolition, and/or special wastes from San Francisco, Vacaville, Fairfield, and other incorporated and unincorporated areas of Solano County and areas in Northern California. A portion of the facility previously operated as a burn dump from 1967 to 1972. The facility is currently owned and operated by Recology.

4. On 15 December 2021, the Discharger submitted an Updated Joint Technical Document (JTD) describing or referencing significant changes at the facility since adoption of previous WDRs Order R5-2016-0056 on 24 June 2016, including, but not limited to, the following:

    a. Updated Site Conceptual Model for underlying geology and hydrogeology;
    b. Implementation of in-situ groundwater remediation to address nitrate-N impacts from composting, sludge, or other discharges at the site;
    c. Evaluation Monitoring Program efforts related to elevated concentrations of manganese and iron in groundwater;
    d. Groundwater monitoring data indicating low-level VOC impacts to soil pore liquid and groundwater;
    e. Updated Water Quality Protection Standards;
    f. Submission of various technical reports to address WDR compliance issues (e.g., composting, groundwater separation, drainage controls, flood controls, and slope stability) as required by the Board's Amended Water Code Section 13301 Order R5-2014-0117-01;
    g. Construction of the French Drain at LF-1 and operation of the soil borrow pit surface water discharge system as required by Amended 13301 Order R5-2014-0117-01;

h. The clean closure attempt and then closure as a Land Treatment Unit (LTU) for WP-9.1B and the historical LTU;
i. Request to revise Landfill Unit 1 (LF-1) closure deadline;
j. Construction of additional landfill expansion modules/phases;
k. Expansion of landfill boundary into “triangle area” south of DM-8.
l. Installation of additional of landfill gas controls;
m. Expansion of the waste to energy plant;
n. Installation of additional perimeter gas monitoring wells;
o. A revised Preliminary Closure and Postclosure Maintenance Plan for LF-1; and
p. Updated financial assurances information.

Due to the above changes, previous WDRs Order R5-2016-0056 findings, prohibitions, and monitoring requirements no longer adequately regulate the facility and therefore that WDRs order is rescinded and replaced by this Order upon adoption. These revised WDRs include updated Prohibitions, Specifications, Provisions, and monitoring and reporting requirements for the facility based on information in the amended JTD and in accordance with California Code of Regulations (CCR), title 27, division 2 (Title 27) regulations, as well as 40 Code of Federal Regulations (C.F.R.) part 258, subtitle D (§ 258.40 et seq.).

5. As the Facility’s owner and operator, the Discharger is responsible for compliance with this Order, which prescribes WDRs regulating construction, monitoring, operation, closure, and post-closure maintenance of the Landfill Units (LFs), WP-9.1A, and LTU listed in **Table 1**. The Discharger further divides their LFs into smaller Disposal Modules (DMs) described further in later findings.

Table 1—Summary of Landfill Units (LFs) Permitted under Order

Unit	Type	Class	Size (acres)	Operating Status	Compliance Status
LF-1	Landfill	Class III	44.5	Operating	In Corrective Action
LF-2	Landfill	Class III	14.7	Operating	In Corrective Action
LF-3	Landfill	Class II	26.2 currently, full build out 82	Operating	In Corrective Action
LF-4	Landfill	Class II	99.7 currently, full build out 138.5	Operating	In Corrective Action
WP-9	Waste Pile	Class II	Formally 7, currently 2.8	Operating, partially closed as LTU	In Corrective Action
LTU	Land Treatment Unit	N/A	Formally 3.2	Closed as LTU	In Corrective Action

6. Jepson Prairie Organics (JPO) is the onsite composting facility located on the north side of the site east, of LF-1 and west of LF-4. The facility includes a 22-acre, engineered composting pad, leachate collection ditches and sumps, two leachate ponds (Pond A: 389,00 gallons including 1.2 feet of freeboard and Pond B: 15,500,000 gallons including 2 feet of freeboard), leachate storage tanks, and storm water controls.

7. The JPO operation was covered under the previous WDRs Order R5-2016-0056. At that time the State Water Resource Control Board General WDRs for Commercial Composting Operations WQ 2020-0012-DWQ (Composting General Order) had not yet been adopted. During the development of these WDRs the Discharger has chosen to apply for coverage under the Composting General Order instead of including JPO under these Title 27 WDRs. Therefore, to ensure continuous coverage, a Notice of Applicability (NOA), 2020-0012-DWQ-R5S004 has been developed concurrently with these WDRs and will be issued under the signature of the Executive Officer of the Central Valley Water Board at the same time these WDRs are issued.

8. The Discharger's current long-term plan for the composting facility is to decommission it to make room for construction of future disposal modules (i.e., LF-4, DM-9 and LF-3, DM-10) in the area. The area must first be clean closed prior to development of new units. See Provision L.7.

Regulatory Authority

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

10. On 9 October 1991, the United States Environmental Protection Agency (USEPA) promulgated Municipal Solid Waste (MSW) landfill regulations under the Resource Conservation and Recovery Act (RCRA), Subtitle D. These regulations are under 40 Code of Federal Regulations part 258, and are hereafter referred to as either "Subtitle D" in reference to the RCRA federal law that required the regulations or "40 C.F.R. part 258". These federal regulations apply to all California Class II and Class III landfills that accept MSW on or after the effective date of Subtitle D (9 October 1993). State Water Resources Control Board Resolution 93-62 (Resolution 93-62) requires the Central Valley Water Board WDRs for MSW landfills to implement the applicable provisions of the federal MSW regulations that are necessary to protect water quality, and in particular the containment provisions and the provisions that are either more stringent or that do not exist in Title 27.

11. Water Code section 13360(a)(1) gives the Central Valley Water Board authority to evaluate and to specify the design, type of construction, and/or particular manner in which compliance must be met in WDRs or other orders related to the discharge of waste at solid waste disposal facilities.

12. 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 I of these WDRs below, and in the Landfill SPRRs and Industrial SPRRs dated December 2015 and April 2016 which are part of this Order. Monitoring and reporting requirements are included in the Monitoring and Reporting Program (MRP) R5-2022-0047 and in the Landfill and Industrial SPRRs. In general, requirements that are either in regulation or otherwise apply to a classified unit are considered to be "standard" and are therefore in the SPRRs. Any site-specific changes to a requirement in the SPRRs are included in

the applicable section (Sections A through M) of these WDRs, and such requirement in the WDRs supersedes the requirement in the SPRRs.

Materials Accompanying Order

13. The following materials are attached to this Order, and incorporated herein:

Attachment A—Constituents of Concern, Approved USEPA Analytical Methods, and Groundwater Concentration Limits
Attachment B—Lowest Elevation of Waste and Compliance Elevations for Separation of Waste from Groundwater Requirements
Attachment C—Location Map
Attachment D—Area Map
Attachment E—Facility Map
Attachment F—Current and Planned Units with Leachate Management Features Map
Attachment I—Landfill Gas Collection and Control Systems Map
Attachment J—Landfill Soil Gas Probes Map
Attachment K—Stormwater Controls Map
Attachment L—Nitrate as N Plume Map (Data from Second Semiannual 2021 Event)
Attachment M—Final Closure Design and Leachate Management Features

Standard Provisions & Reporting Requirements for Non-Hazardous Discharges of Waste Regulated under Subtitle D and/or Title 27, December 2015 Edition (SPRRs or Standard Provisions)

Information Sheet for Waste Discharge Requirements Order R5-2022-0047 (Information Sheet)

14. This Order is also accompanied by the concurrently adopted **Monitoring & Reporting Program R5-2022-0047 (MRP),** the provisions of which are incorporated as part of this Order. Each time the operative MRP is modified by the Central Valley Water Board or its Executive Officer, the revised version shall become the operative MRP (superseding the prior version) and be incorporated as part of this Order (i.e., in lieu of the prior version).

15. To the extent there are any inconsistencies between the provisions of this Order, the operative MRP, or the SPRRs, the provisions of this Order shall be controlling.

16. These WDRs do not in any way waive or override the requirements of Title 27 of the California Code of Regulations (Title 27) or the Resource Consideration Recovery Act (RCRA) (42 U.S.C. § 6901 et seq.), typically referred to as “Subtitle D”, for this facility.

17. Additional information about the Facility is set forth in the **Information Sheet**, which is incorporated as part of these findings.

Site Conditions

18. Onsite facilities at the Recology Hay Road Landfill include monitoring systems (e.g., groundwater, landfill gas, leachate), control systems (groundwater barrier and dewatering facilities), storm water retention ponds, flood control berms, a borrow pit, materials handling and processing areas, access roads, structures, and a maintenance facility. The site also includes a composting facility (covered under NOA 2020-0012-DWQ-R5S004), and a habitat preservation (i.e., Bird Sanctuary Pond) area.

19. The site slopes gently from west to east consistent with the regional topography. Topographic relief is generally limited to small swales, depressions, and mounds or ridges formed from drainage; wind erosion; and creek overflows. Surface elevations in the area range from about 20 to 30 feet above mean seal level (MSL) and with maximum drainage grades of about 2 percent to the southeast. Vegetation in the area consists primarily of farmed livestock feed crops (i.e., grains) and native grasses, forbs, and oak trees. Land uses within one mile of the site include irrigated and non-irrigated agriculture, livestock grazing, wetlands, open space, and transportation (roads).

20. A 2015 Department of Water Resources (DWR) well survey identified at least 5 supply wells within a one-mile radius of the site, including one domestic well, one agricultural well, and three industrial wells. The wells ranged in depth from about 50 to 180 feet below ground surface (bgs). Three of the wells were within 1,000 feet of the landfill facility boundary, including the domestic well and two onsite industrial wells. The domestic well is roughly side gradient to the landfill. Several additional supply wells were identified immediately west of the survey area. Estimated yields for these wells ranged from 30 to 100 gallons per minute (gpm).

Geology and Hydrology

21. The site is in the Putah Plain in the southwestern part of the Sacramento Valley. The Putah Plain is a late Pliocene to Recent age alluvial plain formed by Putah Creek and various meandering streams. Soils underlying the Putah Plan are classified as Stream Channel Deposits (Recent); Younger Alluvium (Holocene); Older Alluvium (late Pleistocene); and the Tehama formation (Pliocene-Pleistocene). Younger Alluvium is found primarily in the northeast part of the site and generally consists of fine-grained sandy silts up to 20 feet thick. Older Alluvium is found at the ground surface over most of the remainder of the site. The Older Alluvium consists of silts and clays ranging from 60 to 130 feet thick interspersed with sand and gravel lenses, and are characterized by a dense, clay-rich B-Horizon. The Tehama formation underlies the Older Alluvium and

consists primarily of silts and clays with a moderate degree of calcium carbonate cementation and fine sand in the matrix. Tehama deposits vary in thickness from about 100 feet thick west of the site to 2,500 feet thick east of the site.

22. Groundwater flow at the site is believed to be greatest in thin, localized, permeable layers that are intercalated by direct contact or through sandy silt and clay layers. These layers seem to be generally connected, but isolated pockets and perched zones have been found. The Discharger reports an average hydraulic conductivity for these sediments range from $3.7x10^{-3}$ cm/sec to $1.5x10^{-2}$ cm/sec. Free-draining saturated sand lenses between layers of moist clay have been observed during borrow pit excavation. Pump tests have confirmed that wells screened in contact with even a small higher conductivity lens will produce water significantly faster than similar wells constructed nearby but only screened in the saturated clay layers.

23. On 30 November 2016 the Discharger submitted the required Water Quality Protection Standards Report as required by WDR R5-2016-0056. However, prior to Board staff's completion of the formal review of the WQPS the Discharger completed additional hydrogeological investigation that suggested that the Site Conceptual Model at that time may not be accurate. After review of the Discharger's data, Board staff concurred with the Discharger's proposal to voluntarily complete additional investigation and analysis to update the Site Conceptual Model. This resulted in significant changes in the understanding of the hydrogeologic framework of the site. Previously, it was thought that the groundwater acted as a single, unconfined aquifer within relatively homogenous low permeability material. However, the updated SCM has delineated several layers within this aquifer. The current understanding is described below:

    a. Shallow Clay: Generally observed from the surface to 5-10 feet below ground surface. Unsaturated, and contains thin, discontinuous lenses of medium to high permeability material that can hold perched water from surface recharge. The Discharger reports in the SCM that "*Occasionally, some groundwater has been observed within these lenses; however, the lenses are localized within a matrix of clay...*" and that "*A considerable amount of water can be present within* (this layer)." This is essentially describing isolated perched zones.

    b. Upper Water Bearing Zone: Continuous silty and clayey sand deposits. The overbank deposits are generally 4 to 5 feet thick and are encountered at an elevation of between 12.5 and 2.5 feet NAVD88. Within the central portion of the site (DM-9.1 and DM-8), channel deposits up to 16 feet thick have been observed. These deposits may represent a historic meandering channel of the former Alamo Creek, where the main channel incised through finer-grained overbank deposits.

c. Underlying Clay Layer: Typically very dense clay layer. The underlying clay also represents floodplain deposits that extend down to the lower water-bearing zone. The observed moisture content of the underlying clay generally ranges from damp to moist. Based on mathematical models this layer may cause semi-confined or leaky aquifer conditions in some areas, but additional characterization (i.e., aquifer tests) would be helpful to better define the aquifer parameters of this layer.

d. Lower Water Bearing Zone A: The lower A zone is characterized by a discontinuous, thin layer approximately 0.5 to 5 feet thick consisting of sandy clay and well-graded sand, which is characteristic of overbank deposits. The lower A water-bearing zone was encountered at an approximate elevation of -8 to -15 feet NAVD88. The lithology below the lower A water-bearing zone transitions back to stiff clay, similar to the shallow and underlying clay.

e. Lower Water Bearing Zone B: The lower B bearing zone exists at an approximate elevation of -25 to -35 feet NAVD88 and is characterized by an additional thin layer approximately 2.5 to 7.5 feet thick consisting of silty to sandy clay with a fine sand content varying from 10 to 20 percent, which is characteristic of overbank deposits. The clays encountered below the lower B water-bearing zone are similar to the other clays encountered with the exception of increased plasticity. These clays are typically very dense and have a similar dark yellowish-brown color as the other clays; however, they consist of between 95 and 100 percent high plasticity fines.

While these zones are defined as distinct layers here, in practice these zones are relatively thin layers the result of deposits from a low energy meandering streams with periodic flooding, or a deltaic sequence. Thus many layers vary greatly in thickness, and even disappear completely in some areas. The interconnection, geometry and lateral extent of these lenses has not been fully defined.

24. Between 2016 and 2018 the Discharger voluntarily performed various investigations including a review of all boring logs, aquifer testing, and three-dimensional computer modelling to re-evaluate the hydrogeologic understanding of the site, culminating in 2019 Hydrogeologic Conceptual Site Model Update (CSM) report. This report and its findings are further discussed in Site Conditions section of this WDR. Most relevant to LF-1 specifically, the CSM suggested that a confined aquifer existed on site based on computer modelling. The Discharger used this information to recommend a new method of determining compliance for separation requirements in which both the base of the unit and the potentiometric surface would be interpolated and compared across the bottom of the unit. However, the modelling results that suggest confined conditions may exist are based on limited data from a few small areas on the site. Although the CSM cites this one model to support its conclusion that confined or semiconfined conditions exist throughout the site, it is in direct conflict with numerous other observations,

pump tests, and studies that were also part of that CSM or referenced by it. Therefore Regional Board staff find it prudent to assume most of the site is unconfined as previously established. This may change if additional investigations are completed and their findings support the existence of extensive confined or semi confined conditions. Based on the base of waste investigation and bore logs for the leachate wells in DM-1A it is also clear that the landfill was constructed below ground surface meaning that some or all of the shallow clay layer was likely excavated prior to filling. As described above, the CSM does not show that the clay layer underlying the unit is contiguous, acts as an effective aquitard, or is connected to the shallow clay zone on all sides of the unit. Therefore, to be prudent and conservative, Board staff must rely on standard methodologies for determining compliance with separation requirements. For unit DM-1A the compliance elevation of 7.67 feet NAVD 88 applies across the entire unit. See Finding 186 for more details. The Discharger must measure separation using groundwater elevation monitoring devices as required by Section B.1.f of the MRP. See the Landfill Unit LF-1 section for more details.

Surface Water

25. The site is in the Elmira Hydrologic Area of the Valley Putah-Cache Hydrologic Unit in the Sacramento Hydrologic Basin Planning Area (as depicted on the interagency hydrologic maps prepared by the Department of Water Resources in August 1986).

26. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition (hereafter Basin Plan) designates beneficial uses; establishes water quality objectives; contains implementation plans and policies for protecting waters of the basin; and incorporates by reference, plans and policies adopted by the State Water Resources Control Board.

27. The site is drained by the A-1 Channel, an unlined agricultural canal fed by New Alamo Creek and a small network of canals north of the site. The A-1 Channel was created from an older portion of Alamo Creek that once flowed diagonally across the eastern part of the site but was re-routed north of the site in the early 1960s. An irrigation drainage channel and storage pond were constructed between the late 1960s and early 1970s that ran parallel to the former A-1 Channel. The irrigation drainage channel carried drain water from the irrigated fields located to the north to the storage pond, which was used to store water prior to redistributing it to the irrigated land. In 1994, the A-1 Channel was again re-routed along the north and east sides of the site and deepened. At the southeast corner of the landfill site, the A-1 Channel resumes the southeasterly course of the former Alamo Creek section, ultimately emptying into Ulatis Creek about 3 miles southeast the site. Ulatis Creek then empties into the Cache Slough, which is tributary to the Sacramento-San Joaquin Delta. See Attachment C.

28. Another unlined drainage ditch runs from the borrow pit along the southern perimeter of LF-3 and LF-4 to the Bird Sanctuary pond. Water pumped from the borrow pit is discharged to this drainage. The base of the drainage channel is approximately 30 ft NAVD88 (27.5 ft NGVD29) at the north-western, western, and southwestern sides of the site, sloping to approximately 20 ft NAVD 88 (17.5 ft NGVD29) in the vicinity of the Bird Sanctuary Pond.

29. This drainage currently flows along the landfill boundary and runs north of the wetland area south of DM-8. However the Discharger has recently received the various approvals needed to mitigate that wetland area and construct a new landfill unit there. As part of that construction the drainage ditch was relocated to the southern end of the future DM-8 and DM-9 units.

30. The Bird Sanctuary Pond is located at the south-eastern corner of the site south of DM-3.2 and was constructed in 1994 as part of a wetlands mitigation project. The Bird Sanctuary Pond receives stormwater and discharge from the borrow pit via the northern and southern perimeter ditches, and drains into the A-1 Channel.

31. In addition to storm water, groundwater pumped from the onsite borrow pit is discharged into the Bird Sanctuary Pond (and subsequently the A-1 Channel) via the southern perimeter drain. Discharges from the borrow pit to surface water at the site are regulated under General WDR Order R5- 2013-0073-01/NPDES NO. CAG995002 (General Waste Discharge Requirements for Limited Threat Discharges of Treated/Untreated Groundwater from Cleanup Sites, Wastewater from Super Chlorination Projects, and Other Limited Threat Wastewaters to Surface Water, adopted on 6 June 2014).

32. The beneficial uses of the A-1 Channel surface water, by application of the tributary rule, are the same as those of the Sacramento San Joaquin Delta specified in the Basin Plan. These existing and potential designated uses include municipal and domestic supply (MUN(, agricultural supply (stock watering and irrigation) (AGR), industrial service supply (IND), industrial process supply (PRO), water contact recreation (REC-1), non-contact water recreation (REC-2), warm freshwater habitat (WARM); cold fresh water habitat (COLD); migration of aquatic organisms (MIGR); spawning, reproduction, and/or early development (SPWN); wildlife habitat (WILD); and navigation (NAV).

Groundwater Conditions

33. Groundwater underneath the Facility is first encountered between approximately 5 and 25 feet below ground surface (bgs). Groundwater elevations range between 20 and -5 feet NAVD 88. The greatest depth to groundwater occurs in the western portion of the site, where the water table has been artificially depressed by the dewatering of the borrow pit. First encountered groundwater is typically highest in the northeast portion of the site. A shallow groundwater divide

splits the site, which is caused by the pumping of surfacing groundwater from the borrow pit. Groundwater generally flows south across the northern border of the site along Hay Road, then splits into western and southeastern directions.

34. Per Title 27 Section §20415(b)(1)(B)(4), the Discharger is required to install a sufficient number of monitoring points and background monitoring points at appropriate locations and depths to yield ground water samples from zones of perched water to provide the best assurance of the earliest possible detection of a release from the Unit. Perched water has been found above the water table within sandy lenses located within the clay in several locations at the site. The full extent, interconnectivity, and frequency of water in these lenses is not currently known. They may not exist everywhere and may not qualify as a protected water body as described in the Basin Plan. These WDRs require the Discharger to identify any perched zones that qualify so a monitoring plan can be developed and implemented as necessary. See Time Schedule Item L.18.

35. In the western portion of the site flow direction is to the west or southwest depending on the season, and flows towards the borrow pit which is dewatered to increase separation of waste to groundwater beneath LF-1. This creates a radial gradient of about 0.009 ft/ft toward the borrow pit on the western half of the site. The groundwater elevation in this area varies from approximately 16 to -5 feet NGVD 88, (13 to 45 feet bgs). The onsite borrow pit west of LF-1 has been excavated below the water table and must be de-watered in the wet season to allow further soil removal. In 2016 the base elevation of the borrow pit was -27.5 feet NAVD88. Groundwater pumped from the borrow pit is used in various site operations, including irrigation, dust control, and composting. Groundwater pumped from the borrow pit is also discharged to surface water (covered under General WDR Order R5- 2013-0073-01/NPDES NO. CAG995002) via the onsite drainage system. The rate of groundwater pumped from the onsite borrow pit has historically averaged about 85-90 million gallons per year (averaging about 233,000 gpd). The water level within the borrow pit is approximately -23.5 ft NAVD88 (-26 ft NGVD29), based on the March 27, 2018 aerial topography survey for the site.

36. In the middle of the site, a transition between the west and east flow regimes may exist. In this area, groundwater flows to the south and the gradient is relatively flat (about 0.001 ft/ft). The average groundwater elevation in this area is about 15-20 feet NAVD 88 (or 5-15 feet bgs). This flow boundary is not well defined, due to a lack of monitoring devices in this area.

37. The effects of groundwater extraction are less significant in the eastern portion of the Landfill. The groundwater flow direction and gradient in the eastern portion of the Landfill is variable but is generally eastward and is generally representative of the regional groundwater gradient, which is approximately 0.0013-0.0018 ft/ft in

the southeast direction. The average groundwater elevation in this area is about 15-20 feet NAVD 88 (or 5-15 feet bgs).

38. According to the Basin Plan, the designated beneficial uses of groundwater at the Facility are municipal and beneficial use (MUN), agricultural supply (AGR) and industrial process supply (PRO).

39. Historical groundwater monitoring data prior to 2010 for the western half of the site indicates the intermittent detection of several VOCs in landfill Point of Compliance wells. The source of the VOCs has not been determined, but the other parameters, detected VOC species, and concentrations detected suggest landfill gas is the source. Some of the VOC detections were not verified by resampling in accordance with Title 27 CCR Section 20415(e)(8)(E). Some detections were single trace detections, the result of the use of contaminated well construction materials, and/or the result of sample or lab contamination, as shown by equipment blank and method blank analyses. VOC types intermittently detected in the highest concentrations included alcohols & ethers (e.g., tert-Butyl Alcohol and Methyl tert-Butyl Ether (MTBE)), ketones (e.g., acetone), Freon compounds (e.g., Dichlorodifluoromethane or Freon 12), and various halogenated VOCs (e.g., Vinyl chloride, Chloromethane, and Idomethane). The data also indicated sporadic detections of a few semi-VOCs (e.g., Bis-2-ethylhexyl Phthalate).

40. Since 2010, after the landfill gas extraction system was expanded, significantly fewer VOC detections occurred, and VOCs have been non-detect in most of the wells. Improvements to the landfill gas extraction system are thought to be the primary cause of this improvement. Sporadic, low level VOC detections including carbon disulfide, benzene, dichlorofluoromethane, chloroform, and toluene have been reported in most semi annual monitoring reports within the last five years. The Discharger performed discrete retests when these detections occurred, which mostly yielded non-detect results. Therefore these detections do not constitute evidence of a release, but support a re-evaluation of the optimization of the landfill gas management system, which is required in the Provisions of this WDR. Detections that did indicate measurably significant evidence of a release are discussed in Findings 41 and 42 below.

41. On February 1, 2017, the Discharger submitted a notification of a preliminary indication of a release at monitoring wells G-23 and G-30 for dissolved manganese due to dissolved manganese detections in exceedance of the concentration limits. Pursuant to Title 27, Sections 20415(e)(8)(E)(3), 20420(j)(2) and 20420(j)(5), verification sampling was performed, and on March 31, 2017, the Discharger submitted a letter stating that there was a measurably significant evidence of a release of manganese detected in G-23 and G-30. To address these detections an Amended Report of Waste Discharge to Establish an Evaluation Monitoring Program was submitted to the Regional Board on June 13,

2017. Results from twelve (12) quarters of EMP monitoring from 2018 through 2020, plus historical data, where available, have demonstrated that manganese detections do not appear to be indicative of a release to groundwater. These WDRs also update the concentration limits for manganese based on historical and recent data.

42. On October 31, 2017, Recology Hay Road submitted a letter notifying the Regional Board that there was another instance of measurably significant evidence of a release of manganese and chloroform detected in monitoring well G-46 during the initial sampling event. The well was resampled, and results confirming the original detections were submitted on November 22, 2017, in a letter titled Re-Sample Results for Groundwater Monitoring Well G-46 Manganese and Chloroform Detections and Next Steps. Chloroform was detected in the first four samples (including the initial sample and the two discrete retests a month later) taken from G-46, ranging from 1.5-0.5 ug/L between September 2017 and December 2017. However the well has been non detect since that time, as indicated by the last 11 sampling events. Therefore this does not appear to be indicative of a release. Similarly, results from twelve (12) quarters of EMP monitoring from 2018 through 2020, plus historical data, where available, have demonstrated that manganese detections do not appear to be indicative of a release to groundwater.

Water Quality Protection Standard

43. Title 27, section 20390 requires that the Central Valley Water Board establish a Water Quality Protection Standard (WQPS) in the WDRs for each unit. The WQPS is comprised of the list of Constituents of Concern (COCs), Concentration Limits, and the identification of the Point of Compliance monitoring devices, and as well as other Monitoring Points. In accordance with Title 27, this Order establishes a WQPS for each WMU at the Facility using the data available at the time this Order was developed. Table 30 presented in Monitoring Requirements J.3 summarizes the background and point of compliance wells for each landfill unit. The groundwater concentration limits are summarized in Appendix A. These limits were calculated based on historical data from background wells listed in Monitoring Requirements J.3 for each respective unit. WQPS concentration limits may be revised based on future data as needed, and issued under a Revised MRP under Water Code section 13267.

44. 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 unless inorganic data or other information suggests otherwise. Since VOCs are not naturally occurring and thus have no background value, they are not amenable to the statistical analysis procedures contained in Title 27 for the determination of a release of wastes from a landfill unit. Title 27, sections 20415(e)(8) and (9) allow the use of a non-statistical evaluation of monitoring

data that will provide the best assurance of the earliest possible detection of a release from a landfill unit in accordance with Title 27, sections 20415(b)(1)(B)(2-4). The discharge of anthropogenic compounds to groundwater or surface water is prohibited, including but not limited to VOCs, SVOCs, chlorophenoxy herbicides, and Organophosphorus compounds. See Prohibition A.6.

45. The Central Valley Water Board may specify a non-statistical data analysis method pursuant to Title 27, section 20080(a)(1). Water Code section 13360(a)(1) allows the Central Valley Water Board to specify requirements to protect groundwater or surface waters from leakage from a solid waste site, which includes a method to provide the best assurance of determining the earliest possible detection of a release. In order to provide the best assurance of the earliest possible detection of a release of non-naturally occurring waste constituents from a landfill unit, the SPRRs specify a nonstatistical method for the evaluation of monitoring data for non-naturally occurring compounds. The MRP under these WDRs specifies the data analysis methods applicable to monitoring data for the site based on information provided in the JTD and other relevant file information. For VOCs and other organic compounds (as well as for inorganic compounds not present in background) a non-statistical method is specified for detection monitoring consistent with Title 27, Section 20080(a)(1).

46. For a naturally occurring constituent of concern (i.e., inorganic constituents present in background), Title 27 requires concentration limits for each constituent of concern be determined either by calculation in accordance with a statistical method pursuant to Title 27, section 20415(e)(8) or by an alternate statistical method meeting the requirements of Title 27, Section 20415(e)(8)(E).

47. Title 27 specifies the prescriptive requirements and performance standards applicable to monitoring data analysis and requires that such methods be implemented as follows:

    a. As specified in the existing MRP under the WDRs; or

    b. In accordance with a technical report (certified by an appropriately registered professional) documenting such methods, submitted to, and approved by, the Central Valley Water Board; or

    c. In accordance with any water quality data analysis software deemed appropriate for such use by either the Central Valley Water Board or SWRCB. See Title 27, Section 20415, subparagraphs (e)(7) and (e)(10).

48. The Discharger submitted a Water Quality Protection Standard Report in January 2020, which proposed inter-well statistics using background wells, point of compliance wells, and concentration limits for LF-1 through 4, and WP-9.1A. Board staff identified several gaps in the monitoring network, which the

Discharger addressed by installing 13 new wells in Fall of 2021. These wells include new background wells G-59 and new Point of Compliance wells G-9A, G-10U, G-16R, G-25R, G-27A, G-28R, G-29R, G-30R, G-56, G-57, G-58, and G-60A. Much of this effort was focused on installing monitoring devices in areas that would not be affected by the slurry wall that surrounds LF-1, 2, and 3 or the various surface water drainages that flow essentially year-round. These new wells will be able to provide an earlier detection if a release occurs.

Unsaturated Zone Conditions

49. The thickness of the unsaturated zone at the site varies depending on various factors such as surface elevation, seasonal groundwater fluctuation, and depth of fill. Outside of the landfill units, the thickness of unsaturated zone ranges from about 36 feet on the western side of the facility where the groundwater table has been pumped down to about five feet NAVD 88 on the eastern side of the facility where the water table is not affected by pumping. Beneath the landfill units, the unsaturated zone consists of the vertical space between the bottom of the landfill unit and top of the water table or capillary break or barrier layer, as applicable. The unsaturated zone thickness below the landfill ranges from 3.9 feet to 27.6 feet in 2020.

Soil Gas

50. The facility has 31 LFG monitoring probes including 23 shallow gas probes (GPs-1, 6, 7, 9 through 19, 20S, 21S, and 22), two deep probes (20D and 21D), and 6 probes with dual completion at both deep and shallow depths (GP-23 through 27). The shallow probes were installed to average depths of about 11 feet bgs and the deep probes to average depths of about 27 feet bgs. The probes are spaced at a minimum of 1,000 ft. intervals around the northwest, west, and south perimeter of the landfill pursuant to § 20925 of Title 27. An exemption to the 1,000 foot spacing requirements was granted for the northeast and eastern landfill perimeter because the A-1 Channel cuts off the vadose zone, preventing potential lateral landfill gas migration. Installation of the landfill gas monitoring probes was documented in the July 2, 2009 *Installation of Perimeter Landfill Gas Monitoring Probes GP 12 through GP-21,* and December 28, 2021 *Landfill Gas Probe Installation and Abandonment Report* (added GP-22 through GP-27 and removed GP-16). See Attachment I: Landfill Gas Collection and Control Systems Map.

51. The Discharger conducted quarterly monitoring of soil gas probes installed along the perimeter of the facility in accordance with Title 27 solid waste regulations and previous WDRs. Historical monitoring of the gas probe generally indicated non-detect methane concentrations along the facility perimeter and elevated methane and VOC concentrations along the landfill unit perimeters prior to start-

up of the LFG extraction system in 2010. LFG concentrations generally declined to non-detects along the unit perimeters by 2014.

52. To ensure that soil pore gas is being adequately monitored for the presence of LFG and to monitor the effectiveness of the LFG extraction system, these WDRs require that the Discharger conduct soil pore gas monitoring on all existing and future facility gas probes, unit perimeter gas probes, and pan lysimeters installed within the capillary break layer beneath the LCRS sumps of the units at the site. As in previous WDRs, the MRP requires that the Discharger conduct field monitoring for total organic vapors, and sample for VOCs if such vapors exceed a given trigger level (i.e., ≥1 percent methane and/or ≥1 ppmv total organic vapors).

Soil Pore Liquid

53. The Discharger does not conduct soil pore liquid monitoring at LF-1 because no soil pore liquid monitoring device was installed at the partially-lined unit when it was constructed.

54. A suction lysimeter was installed beneath LF-2 to monitor soil pore liquid, but it has not been functional since 2010.

55. Historically, soil pore liquid monitoring at the site also included the welded pan lysimeters installed at LFs-3, 4, and WP-9.1A. However as the welded pan lysimeter is completely sealed off from the unsaturated zone by design and is an integrated part of the containment system it is not open to the unsaturated zone. Consequently no unsaturated monitoring zone devices that can monitor natural pore spaces exist for developed units in LF-3, LF-4, and WP-9.1A. Further issues with existing welded pan lysimeters are discussed in the Corrective Action section.

56. Section § 20415 (d) of Title 27 requires a sufficient number of Background and Detection Monitoring Points established at appropriate locations and depths to yield soil-pore liquid samples or soil-pore liquid measurements that provide the best assurance of the earliest possible detection of a release from the Unit. The existing welded pan lysimeters only cover the area beneath the LCRS sump, not the entire unit. Therefore all previously installed welded pan lysimeters do not provide adequate unsaturated zone monitoring as they do not provide the earliest possible detection of a release across the entire unit. These WDRs require the Discharger to evaluate options to install additional monitoring devices and monitor the unsaturated zone beneath these units, independent of the containment system, in order to comply with Section § 20415 (d) of Title 27. See Time Schedule Item L.11. Additionally, future classified units are required to be installed with functioning unsaturated zone monitoring devices that comply with Section § 20415. See Construction Specification D.4.

57. The soil pore liquid monitoring systems at the classified units at the site may be summarized as follows:

a. LF-1 – No lysimeter installed beneath unit's LCRS sump.

b. LF-2 – Suction lysimeter installed beneath unit, has not functioned since 2010.

c. LF-3 – DMs-2.2 and 11 – Un-welded Pan Lysimeters installed within capillary break beneath LCRS sumps

d. LF-4

i. DM-5.1 – Un-welded Pan Lysimeters installed within capillary break beneath LCRS sumps.

ii. DMs-3, 4, 5.2, and 6, 7, 8, and 9.1 -- Pan Lysimeters welded to the bottom of the LDS sumps.

e. WP-9.1A – Welded Pan Lysimeter installed within capillary break beneath LCRS sump.

58. VOC-impacted liquid has been historically detected beneath the primary LCRS sumps at all of the classified units at the site, including LF-2; LF-3 (DMs-2.2 and 11); LF-4 (DMs-3, 4, 5, 6, 7, and 9) and WP-9.1. The highest concentrations of total VOCs in such liquid were detected at LF-3, DM-11 (185 µg/L) and LF-4, DM-3.3 (178 µg/L), while the most liquid was recovered from DM-2.2A (11,350 gal/year). Some of these detections are associated with confirmed releases to groundwater investigated and addressed under previous WDRs, while others are recent and/or intermittent detections within the containment system but outside the LCRS sump (i.e. in welded pans or leak detection layers). The history and status of these releases at the site are summarized in the Corrective Action section of these WDRs.

59. The monitoring and reporting program (MRP) under these WDRs requires that the Discharger monitor all existing pan lysimeters installed beneath LCRS sumps as part of soil pore water monitoring, and all pan lysimeters welded to the base of overlying sumps as part of leak detection monitoring. Future pan lysimeters will be monitored in under the detection monitoring program. See the Section B.2 Unsaturated Zone Monitoring of the MRP.

Seismic Conditions

60. Quaternary fault zones within 62 miles (100 km) of the site include, but are not limited to, the following:

a. Midland Fault Zone (4.3 miles to the east);

b. Vaca Fault Zone (4.5 miles to the SW);
c. Green Valley/Cordelia Fault Zone (14 miles to the west);
d. Concord Fault Zone (22 miles to the SW);
e. Greenville Fault Zone (24 miles to the south);
f. West Napa Fault Zone (25 miles to the west);
g. Dunnigan Hills Fault Zone (26 miles to the north);
h. Rodgers Creek Fault Zone (29 miles to the SW);
i. Calaveras Fault Zone (34 miles to the SW);
j. Hayward Fault (35 miles to the west-SW);
k. San Andreas Fault Zone (50 miles to the southwest); and
l. Foothills Fault Zone (55 miles to the northwest).

All of the above fault zones have Holocene components (faults or fault segments) and at least five (Midland and/or Vaca, West Napa, Hayward, San Andreas, and Foothill) are known to have been historically active during the past 150 years. An additional potentially significant fault zone proximate to the site is the Great Valley Thrust Zone (Segment 4), a submerged, NW-SE trending fault system along the eastern foothills of the Coast Range. Little is currently known about this fault system and it is possible that it may include the Vaca and/or Midland Fault zones. There are no known Holocene faults within 1,000 feet of the facility.

61. Class III WMUs must be designed and constructed to withstand a maximum probable earthquake (MPE), whereas Class II WMUs must withstand a maximum credible earthquake (MCE). (Title 27, § 20370.) The Discharger's site-specific seismic analysis indicates that an earthquake, occurring along the Midland Fault, at a closest rupture distance of 4.3 miles, would result in the events summarized in **Table 2**.

Table 2—Seismic Analysis

Earthquake	Magnitude	Peak Ground Acceleration	Notes
Max Credible Earthquake (MCE)	7.0	0.58 g	PGA value updated by Golder in 2015
Max Probable Earthquake (MPE)	6.4	0.28 g	

Stormwater Conditions

62. Storm water runoff from the landfill units drains by sheet flow, or is directed to, an unlined ditch along the facility perimeter that discharges via two outfalls to the onsite Bird Sanctuary Pond immediately southeast of the landfill. Runoff from

LFs-2 and 3 generally flows counterclockwise to this pond via an unlined ditch along the southern perimeter of the facility, while runoff from LFs-1 and 4 generally flows clockwise to this pond via an unlined ditch along the northern and eastern perimeter of the facility. Runoff from the composting facility is captured and contained in separate facilities within the composting area. A small amount of storm water from LF-2 is also captured in an onsite sedimentation basin immediately south of the onsite composting facility. Storm water discharges from the Bird Sanctuary Pond to the A-1 Channel are sampled under Water Quality Order 2014-0057-DWQ, the Statewide Industrial Storm Water General Permit. See Attachment K: Stormwater Controls Map.

63. LF-1 was designed to handle a 100 year, 24-hour storm event. LFs-2 through 4 were designed to handle a 1,000 year, 24-hour storm event. At final closure of LFs-1 through 4, all landfill units and drainage facilities, including overside drains, perimeter ditch, culverts, and sedimentation basin will be designed to handle a 1,000-year, 24-hour storm event consistent with the Class II designation of LFs-3 and 4.

64. Based on data from the nearest weather station Dixon 121 located approximately 6 miles away, the Facility has an annual average precipitation of 20.5 inches. The mean pan evaporation at the Dixon 121 station is 55.1 inches per year. Mean monthly evaporation typically exceeds mean monthly precipitation in all months of the year, except January, February, November, and December. Net average annual evaporation at the site is estimated to be about 34.6 inches.

65. WMUs must be constructed to accommodate stormwater runoff from 24-hour precipitation events with a return period of 100 years for Class III WMUs, and a return period of 1,000 years for Class II WMUs. (See Title 27, § 20320.) According to National Oceanic and Atmospheric Administration's (NOAA) Precipitation Frequency Atlas 14, Volume 6 Version 2 (rev. 2014), the Facility's 100-year 24-hour rainfall event is estimated to result in 5.45 inches of precipitation. The Facility's 1000-year, 24-hour rainfall events are estimated to result in 7.46 inches of precipitation. Source: NOAA Precipitation Frequency Data Server (https://hdsc.nws.noaa.gov/hdsc/pfds).

66. Two stormwater sedimentation basins are on site, one located south of the JPO operation and one between LF-1 and LF-3 adjacent to the borrow pit. These are depicted in Attachment K. Usually dry during summer months, these stormwater basin will discharge to A-1 channel and eventually Ulatis Creek. The Facility is covered under two Notice of Intents filed for the State Water Board's operative General Permit for Storm Water Discharges Associated with Industrial Activities, NPDES NO. CAS000001, Order 2014-0057-DWQ (Industrial General Permit).

Flood Conditions

67. According to the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (https://msc.fema.gov/portal), portions or all of the footprints of LF-1, LF-3, and LF-4 are located within a 100-year floodplain. However, the Discharger has demonstrated that its affected landfills will not: (a) restrict the flow of a 100-year flood; (b) reduce the floodplain's temporary water storage capacity; or (c) result in a washout that poses a hazard to human health and/or the environment. (See 40 C.F.R. § 258.11(a); State Water Board Resolution No. 93-62, p. 6.).

68. About 80 percent of the landfill facility area (i.e., all but the southwest portion) is within a 100-year flood plain of Ulatis Creek based on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, Map No. 06095C0325E (Community – Panel Number 060631-0325E), effective date May 4, 2009. This area corresponds to about two-thirds of LF-1, one-half of LF-2 and LF-3, all of LF-4, and most of the area planned for future landfill development (e.g., composting area).

69. Title 27 requires that Class II and Class III landfills be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100 year return period. See Sections 20250(c) and 20260(c). Subtitle D regulations (40 CFR 258.11) further require that the Discharger demonstrate that any new, existing, or lateral expansion MSW landfill units located in 100-year floodplain will not restrict the flow of a 100-year flood; reduce the temporary water storage capacity of the floodplain; or result in washout of solid waste so as to pose a hazard to human health and the environment. The owner or operator is required to place the above demonstration in the operating record. The following such demonstration was included in the JTD.

    a. Flow Restriction - The FEMA map indicates that maximum 100-year flood depths adjacent to the site would be about 5 feet. The landfill facility would therefore be unlikely to significantly impede flood waters.

    b. Temporary Floodplain Storage Capacity – Realignment and deepening of the A-1 Channel along the northern and eastern sides of the site in 1994 more than offset the 1,350 acre-feet estimated volume of the 100-year floodplain displaced by the landfill. The onsite borrow pit is also plumbed to the 100-year flood plain via surface drains, providing additional buffering capacity in the event of a 100-year flood. It is therefore unlikely that the landfill will reduce the temporary water storage capacity of the 100-year floodplain.

    c. Washout - All landfill units that would be exposed to a 100-year flood have exterior perimeter berms with a minimum elevation of 30.5 feet NAVD 88 (28 feet MSL), the maximum estimated 100-year flood elevation at the site,

including waves. Specifically, LF-1 and LF-2 have perimeter berms with a minimum elevation of 30.5 feet NAVD 88 (28 feet MSL) and LF-3 and LF-4 each have a perimeter berm with a minimum elevation of 42.5 feet NAVD 88 (40 feet MSL). Future LF-3 and LF-4 expansion modules located within the 100-year floodplain will be constructed with interim perimeter berms no less than 30.5 ft NAVD 88 (28 feet MSL) as necessary for 100-year flood protection and final exterior perimeter berms of at least 42.5 feet NAVD 88 (39.5 feet MSL) as necessary for stability considerations. See Construction Specification D.16.

70. LF-1 was designed to handle a 100 year, 24-hour storm event. LFs-2 through 4 were designed to handle a 1,000 year, 24-hour storm event. At final closure of LFs-1 through 4, all landfill units and drainage facilities, including overside drains, perimeter ditch, culverts, and sedimentation basin will be designed to handle a 1,000-year, 24-hour storm event consistent with the Class II designation of LFs-3 and 4. All compost drainage facilities, including the ponds, were designed to handle a 25-year, 24-hour peak storm event.

71. At final buildout, a perimeter berm with an elevation of approximately 42 feet NAVD88 will be constructed along the final perimeter of the disposal modules to improve waste slope stability. Since this final perimeter berm elevation significantly exceeds the minimum flood protection elevation, the southern berm construction may be developed in two phases. The first phase will include the full perimeter berm construction for the development of eastern portion of DM-8. During this initial phase, a minimum flood control berm will be extended at the southern end of the future remaining portion of DM-8 and DM-11.3 at an elevation of 30.5. The second phase will include the remaining portion of the full perimeter berm development during the construction of DM-8 and DM-11.3.

Facility and Unit Construction and Classification

72. The following findings describe the engineering design, construction, and geologic interpretations related to the landfill. Relevant prohibitions, provisions, standards, and monitoring required to protect water quality are also described in this Order.

73. The Facility includes the following onsite features, systems, and structures:

a. Landfill Unit LF-1, which consists of existing Class III Disposal Modules, DM-1A and DM-1B;
b. Landfill Unit LF-2, which consists of Class III Disposal Modules DM-2.1A and DM-2.1B;
c. Landfill Unit LF-3, which consists of Class II Disposal Modules DM-2.2A, DM-2.2B, DM-11.1, DM-11.2, and future modules DM-2.3. DM-10 and DM-11.3;

d. Landfill Unit LF-4, which consists of Class II Disposal Modules DM-3.1, DM-3.2, DM-3.3, DM-4.1, DM-4.2, DM-4.3, DM-5.1A, DM-5.1B, DM-5.2, DM-6.1, DM-6.2, DM-7.1, DM-7.2, DM-8.1, DM-9.1, and future modules DM-8.2, DM-8.3, DM-8.4, and DM-9.2;
e. Waste Pile 9.1, which consists of Class II modules WP-9.1A and the now closed WP-9.1B,
f. A former Land Treatment Unit (LTU) that has been clean closed;
g. The Jepson Prairie Organics composting operation, which is situated between LF-1 and LF-4 on the northern edge of the property and regulated under the SWRCB General Order;
h. Monitoring and control systems (e.g., groundwater, landfill gas, leachate);
i. storm water systems, retention ponds, surface water channels, and flood control berms;
j. groundwater dewatering facilities including a slurry wall, French drain, and pumping system for surfacing groundwater;
k. a soil borrow pit;
l. materials handling and processing areas;
m. access roads, structures, and other features related to operation and maintenance activities;
n. and habitat preservation (i.e., Bird Sanctuary Pond) area.

Landfill Unit LF-1

74. Landfill 1 is an “existing unit” under Title 27, constructed prior to 9 October 1993. It consists of unlined unit DM-1A and lined unit DM-1B, both of which are Class III units. No additional LF-1 modules are planned for the unit given that it will ultimately be surrounded by LF-3 to the south, LF-4 to the east, Hay Road to the north, and the borrow pit to the west. The Disposal Modules that make up LF-1 are listed in Table 3 below. These WDRs require the closure of LF-1, see Prohibition A.4 and Time Schedule Item L.10.

Table 3— Summary of Disposal Modules (DMs) Contained in LF-1

Unit	Type	Class	Size (acres)	Operating Status	Compliance Status
DM-1A	Landfill	Class III (Unlined)	29.7	Operating	Corrective Action
DM-1B	Landfill	Class III (Lined)	14.8	Operating	Corrective Action

75. DM-1A is a 29.7-acre, unlined landfill unit in the northwest portion of the site. The rectangular-shaped unit is about 1,000 feet wide (east-west) and 1,550 feet long (north-south). The unit does not have an LCRS. The average base of waste elevation is about 22.5 feet NAVD 88 (20 feet MSL), with significant variability as

described in Finding 185. The maximum elevation of the unit is currently about 140 feet NAVD 88, corresponding to about 110 feet above surrounding grade. The maximum height of the waste column in DM-1A is estimated to be over 100 feet. The upper and lower side slopes of the unit average about 4H:1V, respectively. The western side of the unit is contiguous with DM-1B.

76. DM-1A was the original dump at the facility, which began accepting waste in 1964. There are no records of the construction of this unit, but based on more recent investigations it appears that some excavation occurred to increase air space prior to placing waste directly on native soil. The area to the west of DM-1A was excavated for borrow material. This borrow pit was eventually converted into DM-1B in 1992/1993.

77. DM-1A's waste containment system to the extent it is known is described below, from top to bottom:

Module:	DM-1A
Operations Layer:	None
LCRS:	None
Base Liner:	None
Foundation Layer:	Native Soil
Underdrain:	None

Note: There is no lysimeter or vadose zone monitoring devices for DM-1A.

78. Between 1964 and 1992 DM-1A received MSW and other waste. After 1992, DM-1A and DM-1B received only concrete, asphalt, demolition debris, tires, and friable and non-friable asbestos containing waste.

79. A clay-lined leachate pond was constructed in 1987 to the east of DM-1 and was subsequently closed in 1994 prior to the construction of Jepson Prairie Organics (JPO) in 1996.

80. DM-1B is a 14.8-acre, Class III landfill unit constructed in 1992/1993 within the former borrow area immediately west of DM-1A. The unit consists of a single, rectangular shaped disposal module. The module was constructed with a compacted clay base liner and an overlying, 6-inch gravel LCRS. Additional containment system components were constructed along the western portion of the unit to create a 175-foot wide, 6-acre lined area.

81. DM-1B's waste containment system is summarized as follows, from top to bottom:

Module:	DM-1B	
Phase:	Compositely-Lined Portion	Clay-Lined Portion

Area (acres)	6	8.8
Operations Layer:	12 inches soil	
Filter Fabric:	Geotextile	
LCRS:	6 inches gravel	
Base Liner:	60-mil HDPE Geomembrane	none
	12-Inch Compacted Clay Liner (CCL)[1]	
Foundation Layer:	Compacted soil	
Underdrain:	De-watering Trench	None

1: K < 1x10-6 cm/sec.

There is no lysimeter or unsaturated zone monitoring devices for DM-1B.

82. The previous WDRs required that a Final Closure and Postclosure Maintenance Plan (FC/PCMP) for LF-1, including plans and a schedule for closure of DM-1A and DM-1B be submitted no later than 15 October 2019. The Discharger submitted the required document on time. The previous WDRs also required LF-1 to be closed no later than 15 October 2021. However, these WDRs update this closure date based on the review of the October 2019 LF-1 FC/PCMP, as well as ongoing work regarding groundwater separation with the Compliance and Enforcement Unit. See the Unit Closures section for further details.

83. On 15 October 2019 the Discharger submitted the LF-1 Final Closure and Postclosure Maintenance Plan (FC/PCMP) in order to comply with Closure and Postclosure Specifications F.1 of the previous WDRs R5-2016-0056. The FC/PCMP proposed the following cover design, from the bottom up: A two-foot thick foundation layer; A one-foot compacted clay soil (k ≤ 1.0 X 10-6 cm/sec); A one-foot thick vegetative soil layer. The Discharger intends to use onsite native soil and stockpiled contaminated soil (C-Soil) for the foundation layer of the cover. These aspects of the FC/PCMP meet the requirements of Title 27 and are acceptable. However, the FC/PCMP includes seismic analysis that suggests significant displacement would occur during a Maximum Probable Event (MPE), as much as 10.2 inches at the final cover veneer/waste interface. This does not comply with Title 27 section § 20370, which requires that Class III Units shall be designed to withstand the maximum probable earthquake (MPE) without damage to the foundation or to the structures which control leachate, surface drainage, or erosion, or gas. Additionally, Title 27 requires that a cover be constructed to provide similar or more protection of groundwater than the base liner. Historically, clay covers have been shown to be highly susceptible to failure from desiccation in similar climates within the region. As a result approved landfill cover designs have typically included a geosynthetic layers in the Central Valley Region to avoid desiccation and subsequent issue. Because DM-1B is compositely lined and given the issues with separation of the unlined DM-1A unit and seismic analysis, this WDR requires a revision of the final cover design to comply with the

regulations. The revised FC/PCMP shall include a new slope stability analysis. The revised FC/PCMP shall include a new slope stability analysis. If the calculated final cover displacement exceeds 6-inches the submittal shall include a statement, stamped by a California licensed engineer, certifying that the calculated seismically induced displacements complies with all requirements of Title 27 Section § 21750 (f)(5) and Subtitle D, along with all necessary supporting engineering rationale for that certifying statement. See Time Schedule Item L.9.

84. Based on current fill rate projections and available airspace capacity, final build out of LF-1 is anticipated to extend to 2023. Additional disposal of concrete, asphalt, demolition debris, tires, and friable and non-friable asbestos containing waste is unlikely to cause additional compliance issues the closure date is being extended by this WDR through 31 December 2023.

85. The extended operation of LF-1 delays final cover construction, which would likely partially or completely address the separation issue with DM-1A and reduce LFG and leachate generation. Additional evaluation of the LFG and leachate extraction well systems is also required by these WDRs to offset the effects of this delay. See Prohibition A.4 and Time Schedule Items L.9, L.14, and L.15.

Landfill Unit LF-2

86. LF-2 is a Class III landfill unit in the southwestern part of the site constructed with three phases in 1992, 1993, and 1994. The landfill unit contains lined disposal modules DM-2.1A and DM-2.1B. DM-2.1B was constructed around the entire perimeter of DM-2.1A, and both units share a central sump. No additional LF-2 modules are planned for the unit given that it will ultimately be surrounded by LF-3. The Disposal Modules that make up LF-2 are listed in Table 4 below.

Table 4—Summary of Disposal Modules (DMs) Contained in LF-2

Unit	Type	Class	Size (acres)	Operating Status	Compliance Status
DM-2.1A (Phase 1)	Landfill	Class III (Lined)	8	Operating	Corrective Action
DM-2.1B Phase 2	Landfill	Class III (Lined)	2.3	Operating	Corrective Action
DM-2.1B Phase 3	Landfill	Class III (Lined)	4.4	Operating	Corrective Action

87. Phases 1 and 2 accepted refuse prior to October 9, 1993. Phase 3 accepted refuse after October 9, 1993[1].

DM-2.1A

88. The base of DM-2.1A was graded in the shape of an inverse pyramid draining to a central LCRS sump. The thickness of the CCL component was increased to three feet at the LCRS sump. DM-2.1A's containment system components may be summarized as follows, from top to bottom:

Module:	DM-2.1A	
	Sump Area	Floor
Operations Layer:	12 inches soil	
Filter Fabric:	Geotextile	
LCRS:	5 feet gravel	12 inches gravel
Base Liner:	80-mil HDPE Geomembrane	60-mil HDPE Geomembrane
	36 inch of CCL[1]	12 inch of CCL[1]
Foundation Layer:	Compacted soil	
Capillary Break:	None	

1: $K < 1x10^{-6}$ cm/sec.

The base sections for both phases were graded at a 2 percent grade toward the central LCRS sump, which was plumbed to an 18-inch riser pipe extending along the top of the base liner to an access point/collection tank along the southern perimeter of the unit. The LCRS also included perforated 6-inch diameter leachate collection pipes placed diagonally and across the module at the base of the pea gravel. No capillary break layer was included in the design because the module was constructed with greater than the requisite 3-feet minimum separation from high groundwater at the LCRS sump. The vadose zone beneath LF-2 is monitored by a single suction lysimeter, VZ-2.1. Since 2010 attempts to sample or operate this lysimeter have failed.

[1] On 9 October 1993, the new RCRA Subtitle D regulations (40 CFR Part 258) went into effect. These regulations are applicable to landfills receiving municipal solid waste (MSW) and establish minimum Federal criteria for the siting, design, operation, and closure of MSW landfills that began accepting waste after 9 October 1993.

DM-2.1B

89. DM-2.1B is 7.1-acres and was constructed in two phases in 1993 and 1994, respectively. DM-2.1B's containment system components may be summarized as follows, from top to bottom:

Module:	DM-2.1B			
	Base Liner		Perimeter Levee	
Phase:	Phase 1	Phase 2	Phase 1	Phase 2
Operations Layer:	12 inches soil			
Filter Fabric:	Geotextile			
LCRS:	12 inches gravel		N/A	
Base Liner:	60-mil HDPE Geomembrane			
	12 inch CCL[1]	24 inch CCL[2]	12 inch CCL[1]	24 inch CCL[2]
Foundation Layer:	Re-compacted native soil		Re-compacted berm soil	
Capillary Break:	None			

1: $K < 1x10^{-6}$ cm/sec.
2: $K < 1x10^{-7}$ cm/sec.

No capillary break layer or unsaturated zone monitoring devices were included in the design.

90. Approximately 593,000 cubic yards of C-Soil and sludge are estimated to have been discharged to/stockpiled at LF-2 and LF-3 since January 1993. See the Information Sheet for more detail. By definition this soil is a designated waste. These WDRs authorize the existing C-Soil stockpiles to remain on the disposal modules where they exist today, but require that they are managed, monitored, and stored as appropriate for designated waste per Title 27. These WDRs also authorize the discharge of special wastes such as C-Soil to Class II units LF-3 and LF-4, but no new C-Soils may be discharged to units LF-1 or LF-2. The Discharger plans to incorporate the C-soil as the foundation layer for the final cover system or use as alternative daily cover across Class II disposal modules.

91. Consistent with the previous WDRs R5-2016-0056, no additional lead contaminated soil (LC-soil) or C-soil will be added to the existing stockpiles on DM-2.1A and DM-2.1B. These WDRs require existing stockpiles to be covered, managed, and monitored as designated waste. See Time Schedule Item L.7.

Landfill Unit LF-3

92. LF-3 is a Class II landfill unit currently consisting of two disposal modules, DM-2.2 and DM-11. Additional LF-3 expansion modules are planned for future construction north of the existing LF-3 modules, including, but not necessarily

limited to, DM-10 in the area presently used for the JPO composting operation. The Disposal Modules that make up LF-3 are listed in Table 5 below.

Table 5—Summary of Disposal Modules (DMs) Contained in LF-3

Unit	Type	Class	Size (acres)	Operating Status	Compliance Status
DM-2.2	Landfill	Class II	11.8	Operating	Corrective Action
DM-2.3	Landfill	Class II	12.5 (est.)	Planned	Corrective Action
DM-10	Landfill	Class II	23 (est.)	Planned	Corrective Action
DM-11.1	Landfill	Class II	7.3	Operating	Corrective Action
DM-11.2	Landfill	Class II	7.3	Operating	Corrective Action
DM-11.3	Landfill	Class II	9.5 (est.)	Planned	Corrective Action

93. DM-2.2 was constructed in 1995 in the southwest corner of the site immediately west of DM-2.1B. The 11.8-acre expansion module was constructed in accordance with engineered alternative designs for groundwater separation (EAD/S) and waste containment (EAD/L) approved under previous WDR Order No. 95-269. The EAD/S included a minimum separation of 2 feet from the bottom of the primary LCRS (including primary LCRS sumps) to the highest anticipated elevation of groundwater, including capillary fringe. The EAD/L included the substitution of geosynthetic clay liner (GCL) for one foot of compacted clay in the composite base liner and two feet of clay in the composite side slope liner. Sideslope containment was required along perimeter levee slopes and slopes abutting Class III landfill LF-2.

94. DM-2.2's containment system components may be summarized as follows, from top to bottom:

	Base Liner	Side Slope	
		Perimeter Levee	2.1B Interface
Operations Layer	12 Inches of soil[1]	18 Inches of soil[1]	18 Inches of soil[1]
Filter Fabric:	Geotextile	--	--
LCRS:	12 inches gravel[1,2]	--	Geocomposite Drainage Strips[3]
Cushion Layer	Geotextile Cushion[4]		
Base Liner:	60-mil HDPE Geomembrane[5]		
	GCL[6]		
	12 inch CCL[1]	--	--
Foundation Layer:	6 Inches of soil[1]	--	6 Inches of soil[1]
Capillary Break:	12 Inches of gravel[1,2]	Geocomposite[2]	--
Subgrade:	Re-compacted native soil[1]		--

1. Liner component soils and gravels prepared/compacted in accordance with project specifications.
2. K > 1 cm/sec per project specifications.
3. Geocomposite consists of geonet bonded to geotextile filter layer.
4. Geotextile cushion layer consists of 16 oz/yd2 non-woven fabric.
5. Single side textured geomembrane used with textured side down.
6. K < 5x10 -9 cm/sec per project specification.

An un-welded pan lysimeter was installed beneath DM-2.2 to monitor the unsaturated zone.

95. DM-11 was constructed in two phases in 1997 (DM-11.1) and 1998 (DM-11.2), respectively. Both phases of the 14.6-acre module were constructed consistent with modified EADs for groundwater separation and liner (i.e., modified EAD/S and EAD/L) approved under WDR Order No. 97-145, which reduced the required thickness of the capillary break and LCRS layers to six inches each. The modified EAD/L also reduced the containment system requirements for side slopes abutting portions of Class III LF-2. Notwithstanding the reduced EAD/S, WDR Order No. 97-145 retained the requirement that the Discharger maintain 2.5 feet of operational separation at the module.

96. DM-11's containment system components may be summarized as follows, from top to bottom:

	Base Liner	Side Slope	
		Perimeter Levee	2.1B Interface
Operations Layer	12 Inches of soil[1]	18 Inches of soil[1]	18 Inches of soil[1]
Filter Fabric:	Geotextile	Geocomposite	--
LCRS:	6 inches gravel[1,2]		
Base Liner:	60-mil HDPE Geomembrane[4]		
	GCL[5]		--
	12 inch CCL[5]	--	
Foundation Layer:	6 Inches of soil[1]	--	6 Inches of soil[1]
Capillary Break:	6 Inches of gravel[1,2]	Geocomposite	n/a
Subgrade:	Re-compacted native soil[1]	--	n/a

1. Liner component soils and gravels prepared/compacted in accordance with project specifications.
2. K > 1 cm/sec per project specifications.
3. Cushion layer eliminated on levee sideslope to increase interface shear strength of base liner.
4. Single side textured geomembrane used with textured side down.
5. K < 5x10-9 cm/sec per project specifications.

The base of each module phase was graded with a 2 percent cross slope toward central LCRS header pipes (sloped at one percent) draining to two LCRS sumps located on the southern perimeter of the module. Un-welded pan lysimeters were installed beneath DM-11.1 and DM-11.2 within the capillary break layer to monitor the vadose zone.

97. The Discharger has proposed a design in the Updated JTD for construction of future LF-3 modules which generally consistent with previous WDR approvals for LF-3. The previous WDRs R5-2016-0056 specified that the design for constructions of new modules shall include a double liner system, an increase in design separation to 5 feet, and a capillary break layer in those areas where the base elevation of the liner will be below the calculated capillary rise plus the required five feet of separation from groundwater. See The New Unit Construction section and the Construction Specifications for further details and requirements.

98. DM-2.3 is a planned unit immediately north of DM-2.1 and DM-2.2 and south of LF-1. The module is planned to be approximately 12.5 acres. The Discharger has proposed a prescriptive liner system as described in the New Unit Construction section. Limits of this future disposal modules may change. This WDR carries over the requirement of WDRs R5-2016-0056 that all future units, including DM-

2.3, be constructed and operated to the Title 27 prescriptive standard 5 feet of separation between waste and groundwater. See Construction Specification D.5.

99. DM-10 is a planned unit immediately east of LF-1 and west of LF-4 on the northern portion of the site, where the JPO composting operation currently exists. The module is planned to be approximately 23 acres. The Discharger has proposed a prescriptive liner system as described in the New Unit Construction section. Limits of this future disposal modules may change. This WDR carries over the requirement of WDRs R5-2016-0056 that all future units, including future modules of DM-10, be constructed and operated to the Title 27 prescriptive standard 5 feet of separation between waste and groundwater. See Construction Specification D.5.

100. DM-11.3 is a planned unit immediately north of DM-11.1 and DM-11.2 and south of future DM-10 which is currently the JPO composting operation. The module is planned to be approximately 9.3 acres. The Discharger has proposed a prescriptive liner system as described in the New Unit Construction section. Limits of this future disposal modules may change. This WDR carries over the requirement of WDRs R5-2016-0056 that all future units, including DM-11.3, be constructed and operated to the Title 27 prescriptive standard 5 feet of separation between waste and groundwater. See Construction Specification D.5.

101. Clean closure of the JPO composting operation must be completed and approved by the Regional Board prior to development of DM-10, DM-11.3, or any disposal module within the footprint of the composting operation.

102. The LCRS sumps for the LF-3 landfill modules were constructed to a maximum depth of 1.5 feet with 3H:1V side slopes. Each sump was equipped with a dedicated submersible pump, including liquid level sensor and 18” HDPE riser pipe for sump access and pumping. External pump controls with electronic displays were also installed to allow for monitoring the sumps and adjusting the pump controls. The system also included level switches set at minimum and maximum allowable liquid levels to ensure safe pump operation and to prevent head buildup on the liner beyond the sump. Volume pumped is also automatically recorded. All pump control systems are powered by solar cells installed near each module/sump. For modules with a LDS (secondary LCRS), a secondary riser pipe was also installed to allow for pumping any liquid detected.

Landfill Unit LF-4

103. LF-4 is a Class II landfill unit on the eastern portion of the site currently consisting of 14 disposal modules. Additional LF-4 expansion modules are planned for future construction north of the existing LF-3 modules. The Disposal Modules that make up LF-4 are listed in Table 6 below.

Table 6—Summary of Disposal Modules (DMs) Contained within LF-4

Unit	Type	Class	Size (acres)	Operating Status
DM-3.1	Landfill	Class II	8.4	Operating
DM-3.2	Landfill	Class II	4.6	Operating
DM-3.3	Landfill	Class II	8.6	Operating
DM-4.1	Landfill	Class II	8	Operating
DM-4.2	Landfill	Class II	5.1	Operating
DM-4.3	Landfill	Class II	5.3	Operating
DM-5.1	Landfill	Class II	11.9	Operating
DM-5.2	Landfill	Class II	8	Operating
DM-6.1	Landfill	Class II	6.9	Operating
DM-6.2	Landfill	Class II	5.2	Operating
DM-7.1	Landfill	Class II	6	Operating
DM-7.2	Landfill	Class II	3	Operating
DM-8.1	Landfill	Class II	8.8	Operating
DM-8.2	Landfill	Class II	9.6	Planned
DM-8.3	Landfill	Class II	8.7	Planned
DM-8.4	Landfill	Class II	8 (est.)	Planned
DM-9.1	Landfill	Class II	10	Operating
DM-9.2	Landfill	Class II	13.5 (est.)	Planned

104. DM-5 was constructed in two phases, including DM-5.1 (2001) and DM-5.2 (2004), respectively. DM-5.1 (11.9 acres) was constructed in accordance with the design for LF-3 DM-11 (see Finding 96) approved under previous WDRs R5-2016-0056 (see Finding 113 of that Order), except that no interface containment

system was necessary because the module is not adjacent to a Class III unit. The base of DM-5.1 was graded with a 2 percent cross slope toward central LCRS header pipes (sloped at one percent) draining to two LCRS sumps located on the eastern perimeter of the module. DM-5.2 (8 acres) was constructed in accordance with the design for DM-4.1 described below and similarly graded to drain to a single LCRS sump located on the northern perimeter of the module. The units were built with an approved EAD/L consisting of a double composite base liner system and a single composite perimeter sideslope liner system. A welded pan lysimeter was installed beneath DM-5.2 within the capillary break, welded to the LCRS sump, to monitor the vadose zone. However, as further described in Findings 55 and 56, the welded pan lysimeters as installed are not sufficient to meet the requirements for unsaturated zone monitoring devices.

105. DM-4 was constructed immediately south of DM-5 along the eastern side of the facility. The 18.4-acre module was constructed in three phases over a 10-year period, including DM-4.1 (2003). DM-4.2 (2006) and DM-4.3 (2013), respectively. All three phases were constructed in accordance with the 2.5-foot minimum EAD/S approved under previous WDR Order No. 95-269 and the revised EAD/L approved under previous WDR Order No. R5-2003-0118. The approved EAD/L consisted of a double composite base liner system and a single composite perimeter sideslope liner system. The thickness of the containment system was used to satisfy the minimum 2.5-foot separation requirement under the EAD/S. A welded pan lysimeter was installed beneath DM-4.1, welded to the bottom of the LCRS sump, to monitor the vadose zone. However, as further described in Findings 55 and 56, the welded pan lysimeters as installed are not sufficient to meet the requirements for unsaturated zone monitoring devices. DM-4.2 and DM-4.3 do not have LCRS sumps or welded pans.

106. DM-4's containment system components are summarized as follows, from top to bottom:

	Base Liner	Perimeter Levee Side Slope
Operations Layer	12 Inches of soil[1]	18 Inches of soil[1]
Filter Fabric:	Geotextile	Geocomposite
LCRS:	6 inches gravel[1,2]	
Base Liner:	60-mil HDPE Geomembrane[3]	
	24 inch CCL[4]	GCL
Foundation Layer:	6 Inches of soil[1]	--
Leak Detection Sump:	Geocomposite	--
Secondary Liner:	60-mil HDPE Geomembrane[3]	--
Capillary Break:	None	
Subgrade:	Re-compacted native soil	

1. Liner component soils and gravels prepared/compacted in accordance with project specifications.
2. K > 1 cm/sec per project specifications.
3. Geomembrane double-side textured over base liner and single side textured (textured side down) on side slopes.
4. K < 5x10-9 cm/sec per project specifications.

The base of DM-4.1 was graded with a 2 percent cross slope toward central LCRS header pipes (sloped at one percent) draining to an LCRS sump installed on the eastern perimeter of the facility. Consistent with the approved revised EAD/L, LFG collection pipes were also installed within the LCRS layer to allow for future connection to LFG control system, as needed. An electrical leak location survey was also conducted as part of the construction CQA to verify the integrity of the primary liner system.

107. No LCRS sumps were constructed at either module phase DM-4.2 or DM-4.3, which were graded to rely on other modules/module phases for leachate drainage. The northern part of DM-4.2's LCRS was graded to drain north into DM-5.2's LCRS, while the remainder of DM-4.2's LCRS was graded to drain east into DM-4.1's LCRS sump. DM-4.3's LCRS was graded to drain east into DM-4.2's LCRS.

108. DM-3 was constructed immediately south of DM-4 in the southeast corner of the facility. The 21.6-acre module was constructed in three phases, including DM-3.1 (2008), DMs- 3.2 (2010), and DM-3.3 (2010), respectively. All three phases of the module were constructed in accordance with the EADs approved for DM-4 and subsequent modules under previous WDRs (e.g., double liner, LDS, 2.5-foot minimum separation). The LCRS for each phase was also graded and constructed using the same design as DM-4 (see Finding 106), except that each

of the three phases of the module was constructed with its own LCRS sump located along the southeast corner of the facility. A welded pan lysimeter was installed beneath each DM-3 unit, welded to the bottom of the LCRS sumps, to monitor the vadose zone. However, as further described in Findings 55 and 56, the welded pan lysimeters as installed are not sufficient to meet the requirements for unsaturated zone monitoring devices.

109. DM-6 was constructed immediately west of DM-5 in the eastern part of the former LTU area clean-closed in 2011. The 12.1-acre module was constructed in two phases in 2012 (DM-6.1) and 2013 (DM-6.2), respectively. Both phases of the module were constructed with the same double-lined containment system design as that for DMs-3 and 4 (see Finding 106), as approved under previous WDRs. Both phases were contiguously graded to drain to a single LCRS sump located on the northern perimeter of the facility/DM-6.1. A welded pan lysimeter was installed beneath each DM-6 unit, welded to the bottom of the LCRS sumps, to monitor the vadose zone. However, as further described in Findings 55 and 56, the welded pan lysimeters as installed are not sufficient to meet the requirements for unsaturated zone monitoring devices.

110. DM-7 was constructed immediately south of DM-4. The 12.1-acre module was constructed in two phases in 2015 (DM-7.1) and 2017 (DM-7.2), respectively. Both phases of the module were constructed with the same double-lined containment system design as that for DMs-3, 4, and 6 (see Finding 106), as approved under previous WDRs. Both phases were contiguously graded to drain to a single LCRS sump located on the southern perimeter of the facility/DM-7.2. A welded pan lysimeter was installed beneath DM-7.2, welded to the bottom of the LCRS sumps, to monitor the vadose zone. However, as further described in Findings 55 and 56, the welded pan lysimeters as installed are not sufficient to meet the requirements for unsaturated zone monitoring devices.

111. The Discharger has proposed a design in the Updated JTD for construction of future LF-4 modules which generally consistent with previous WDR approvals for LF-4. This WDR carries over the requirements of WDRs R5-2016-0056 that the design for constructions of new modules shall include a double liner system, an increase in design separation to 5 feet, and a capillary break layer in those areas where the base elevation of the liner will be below the calculated capillary rise plus the required five feet of separation from groundwater. See The New Unit Construction section and the Construction Specifications for further details and requirements.

112. DM-8 is partially constructed immediately west of DM-7 and south of DM-9. Currently the module consists of one phase, the 8.8 acre DM-8.1 constructed in 2019. DM-8.1 was constructed with the same double-lined containment system design as that for DMs-3, 4, 6, and 7 (see Finding 106), except the foundation layer was 36 inches of soil instead of 6 inches. The LCRS and LDS systems

currently drain to temporary sumps on the southern end of the unit. The Discharger has recently received various approvals and updated their Use Permit to develop the area immediately south of DM-8.1, where they plant to construct an additional disposal module to be contiguously graded to drain to a single LCRS sump located on the southern perimeter of the facility.

113. The Discharger plans to develop at least one additional DM-8 disposal module immediately west of DM-8.1, which will similarly be contiguously graded to drain to a single LCRS sump located on the southern perimeter of the facility. The additional module(s) is planned to be approximately 26.7 acres. The Discharger has proposed a liner system as described in Finding 233. Limits of this future disposal modules may change. This WDR carries over the requirement of WDRs R5-2016-0056 that all future units, including future modules of DM-8, be constructed and operated to the Title 27 prescriptive standard 5 feet of separation between waste and groundwater. See Construction Specification D.5.

114. DM-9 is partially constructed immediately west of DM-6. Currently the module consists of one phase, the 10 acre DM-9.1 constructed in 2018. DM-9.1 was constructed with the same double-lined containment system design as that for DMs-3, 4, 6, and 7 (see Finding 106), except the foundation layer was 36 inches of soil instead of 6 inches. DM-9.1 was contiguously graded to drain to a single LCRS sump located on the northern perimeter of the facility. A welded pan lysimeter was installed beneath DM-9.1, welded to the bottom of the LCRS sumps, to monitor the vadose zone. However, as further described in Findings 55 and 56, the welded pan lysimeters as installed are not sufficient to meet the requirements for unsaturated zone monitoring devices.

115. The Discharger plans to develop at least one additional DM-9 disposal module immediately west of DM-9.1, which will similarly be contiguously graded to drain to a single LCRS sump located on the northern perimeter of the facility. The additional module(s) is planned to be approximately 13.5 acres. The Discharger has proposed a prescriptive liner system as described in Finding 233. Limits of this future disposal modules may change. This WDR carries over the requirement of WDRs R5-2016-0056 that all future units, including future modules of DM-8, be constructed and operated to the Title 27 prescriptive standard 5 feet of separation between waste and groundwater. See Construction Specification D.5.

116. The LCRS sumps for the LF-4 landfill modules were constructed to a maximum depth of 1.5 feet with 3H:1V side slopes. Each sump was equipped with a dedicated submersible pump, including liquid level sensor and 18” HDPE riser pipe for sump access and pumping. External pump controls with electronic displays were also installed to allow for monitoring the sumps and adjusting the pump controls. The system also included level switches set at minimum and maximum allowable liquid levels to ensure safe pump operation and to prevent

head buildup on the liner beyond the sump. Volume pumped is also automatically recorded. All pump control systems are powered by solar cells installed near each module/sump. For modules with a LDS (secondary LCRS), a secondary riser pipe was also installed to allow for pumping any liquid detected.

Waste Pile WP-9.1 and LTU

Table 7—Summary of Other Units

Unit	Type	Class	Size (acres)	Operating Status	Compliance Status
WP-9.1A	Waste Pile	Class II	2.8	Operating	Corrective Action
WP-9.1B	Waste Pile	Class II	4.5	Closed	Corrective Action
LTU	Land Treatment Unit	N/A	3.2	Closed	Corrective Action

117. WP-9.1 was originally constructed as disposal module DM-9.1 in 1997, immediately east of the composting area. The 7-acre module represented the first phase of a 22.4-acre module (DM-9) planned for that area. In 1998, the module was converted for use as a sludge storage facility and in 2001 was reclassified (under previous WDRs Order No. 5-01-101) as a Class II waste pile. In 2016 the Discharger attempted clean closure, as required by Title 27 Section § 21410, of the east half of WP 9.1 (WP-9.1B) so that DM-9.1 could be constructed as part of Unit LF-4. The clean closure attempt was unsuccessful as groundwater impacts persist, however WP-9.1B was closed as an LTU and DM-9.1 was constructed within its footprint. The unit remains in corrective action. See the Corrective Action section for more detail.

118. WP-9.1 was constructed with the same engineered alternative designs as DM-11, including minimum groundwater separation and base liner and perimeter levee. An un-welded pan lysimeter was installed beneath WP-9.1A within the capillary break, welded to the bottom of the LCRS sump, to monitor the vadose zone.

119. Under previous WDRs, sludge drying operations were also historically conducted at an onsite landfill treatment unit (LTU) immediately east and south of WP-9.1. As development at Recology Hay Road continues, the use of WP-9.1A as a Class II waste pile will be discontinued and clean-closed. Following clean

closure, Recology Hay Road currently plans to construct the remaining portion of DM-9 in its place.

120. WP-9.1 has been in corrective action monitoring program since 2001 due to a leachate release that caused nitrate-N and other nitrogen compound impacts to groundwater and the unsaturated zone. This is discussed further in the Corrective Action section.

121. As described in the 18 November 2015 WP 9.1 CQA report, partial clean closure activities began in 2015. The liner components in the eastern portion of WP-9.1 were removed. A new perimeter berm was constructed within the remaining western portion of WP-9.1. A new 60-mil high-density polyethylene (HDPE) geomembrane was installed on the outer portion of the containment berm. The purpose of this geomembrane is to seal the edge of the leachate collection and removal system (LCRS) gravel layer consistent with the existing WP-9.1 design. This project has reduced the footprint of WP 9.1 by more than 50 percent. The remaining western portion of WP 9.1 is now designated WP 9.1A.

122. An access road and tipping pad was constructed on the southern side of WP-9.1 for offloading de-watered sewage sludge. Prior to reconfiguring the unit as part of the clean closure effort, the capacity of WP-9.1 was estimated to be 54,000 cubic yards of wet sludge, with three feet of freeboard from the top of the sludge to the top of the perimeter berms. The capacity of WP-9.1A is currently 18,300 cubic yards. All contact storm water collected within the waste pile berms is treated as leachate per Title 27 CCR Section 20365(b). All storm water diverted by the berms is directed to a perimeter storm water ditch along the northern side of the module, sized for a 1,000-year 24-hour storm.

123. The LTU was sited on a 20-acre area between DM-9 and DM-5 in the northeast corner of the site in the summer of 2000; however, LTU operations did not exceed a combined area of about 13 acres. The design included a 5-foot treatment zone below ground surface for sludge constituents to be degraded, transformed, or demobilized. A field pilot to demonstrate the feasibility of the LTU in treating wastes per Title 27 CCR Section 20250(b)(5) was conducted prior to construction of the unit. De-watered WWTP sludge was applied to the test area to dry during the summer and lysimeters were placed immediately below the treatment zone to detect the possible migration of sludge constituents. The project data results indicated that no sludge COCs were detected in samples collected below the treatment zone.

124. The Discharger began the process of clean closing the western portion of WP-9.1 (designated WP-9.1B) and the LTU during 2016. Removal of all waste, liner components, and impacted soil down to the water table was completed and described in the November 2016 *Final Clean Closure Certification Report for the Eastern Portion of Waste Pile 9.1 and Adjacent Land Treatment Unit* report. The

area was backfilled with clean fill in preparation for development of DM-9.1. However nitrate-N impacts in groundwater persisted within the footprint of these units, and the Discharger elected to close the units as LTUs per the requirements of Title 27 Sections § 21410 and § 21420. Based on the plume it is unclear if these impacts were caused by the operation of or release from either WP-9.1, the LTU, or the JPO composting operation and compost leachate ponds. The Discharger has made efforts to remediate these impacts, which is further discussed in the corrective action section.

Previous Engineered Alternative Designs

125. Title 27, section 20240(c) requires that all new landfills and waste piles be “sited, designed, constructed, and operated”, and that all existing landfills be “operated”, to ensure that wastes will be a minimum of five feet above the highest anticipated elevation of underlying ground water (i.e., Title 27 prescriptive standard for groundwater separation). Section 20260(a) further requires that Class III landfills be located where site characteristics provide adequate separation between nonhazardous solid waste and waters of the state (i.e., Title 27 performance standard for groundwater separation).

126. Previous WDRs approved and/or prescribed requirements for engineered alternative designs for groundwater separation (EAD/S) allowing for less than the 5-foot minimum prescriptive standard groundwater separation required under Title 27, section 20240(c), as summarized below:

    a. WDRs Order No. 89-178 allowed for a 3-foot minimum separation provided that the module design included a composite base liner (geomembrane overlying CCL) that satisfied Chapter 15 (now Title 27) engineered alternative design criteria and was approved by the Board under revised WDRs. The western portion of DM-1 (DM-1B) and all of DM-2.1 (DMs-2.1A and -2.1B) were subsequently constructed in accordance with this EAD/S, as approved under WDRs Order No. 95-202.

    b. WDRs Order No. 95-202 approved a 2.5 foot minimum EAD/S for Class II expansion modules that specified a one-foot gravel capillary break layer beneath the base liner system. WDRs Order No. 97-145 subsequently reduced the required capillary break thickness to 1/2-foot, but retained a requirement that at least 2.5 feet of separation be maintained at the modules. The modified EAD/S included geocomposite capillary break layer designs for the perimeter levee side-slopes. DM-2.2A, DM-2.2B, DM-11.1, and DM-11.2 were subsequently constructed in accordance with this EAD/S, as approved under WDRs Order No. 95-202.

    c. WDRs Order No. R5-2003-0118 approved a modified 2.5 foot minimum EAD/S that included a geomembrane capillary barrier layer in lieu of a gravel

capillary break layer. All of DM-3, DM-4, DM-5, DM-6, and DM-7 were subsequently constructed in accordance with this EAD/S, as approved under WDRs Order No. 95-202.

In each of the above designs, the Discharger demonstrated, to the satisfaction of the Central Valley Water Board, that the siting, design, and construction of a containment system meeting Title 27 prescriptive standards for a minimum of 5 feet of groundwater separation was infeasible due to naturally high groundwater at the site; that the proposed EAD/S was consistent with the performance goal addressed by the prescriptive standard; and that it afforded equivalent or better protection against water quality impairment associated with a release.

127. No EAD/S was approved for LF-1 under previous WDRs and the unit was required to be operated (i.e., de-watered) in accordance with Title 27 prescriptive requirements (i.e., 5 feet minimum separation between wastes and groundwater).

128. WDRs Order No. R5-2016-0056 required that all new LF-3 and new LF-4 landfill modules, with the exception of DM-7.2, be designed and constructed with additional containment features and a minimum of 5 feet of groundwater separation. The Discharger is also required to operate all new LF-3 and LF-4 landfill modules so as to maintain at least 5 feet of separation from the lowest elevation of the waste (e.g., primary LCRS sump) to the highest anticipated elevation of underlying groundwater, including capillary fringe, at that location. The Discharger is also required to install piezometers outside the liner limit adjacent to each LCRS sump that allow for measurement of the groundwater table.

129. At this time the capillary break layers installed in existing units are not monitored or actively drained in order to keep them dry and maintain separation. These WDRs require existing units to be retrofitted such that the capillary break can be drained, and future units constructed with a capillary break layer will be required to include a capillary break sump and automatic pumping system. See Construction Specification D.1. Units that include capillary break layers that cannot be monitored and maintained will be required to maintain the Title 27 prescriptive limit of 5 feet of separation between waste and groundwater.

Soil Borrow Pit

130. The current soil borrow pit is located on the western portion of the facility, adjacent to the western edges of LF-1 and LF-2. Surfacing groundwater, groundwater discharging from the French Drain north of LF-1, and surface water runoff that collects within the borrow pit. This collected water is pumped from the borrow pit and used in various site operations, including irrigation, dust control, and composting. Excess water is pumped from the borrow pit and discharged intermittently into a perimeter storm water ditch, which flows along the southern

perimeter of the landfill operation into the Bird Sanctuary Pond. Discharges from the borrow pit to surface water at the site are regulated under General WDR Order R5- 2013-0076-012/NPDES NO. CAG995002 (General Order for Limited Threat Discharges to Surface Water, adopted on 1 September 2017).

131. The existing permitted borrow pit measures approximately 80 acres. In 2016 the pit had a maximum depth of approximately 60 feet below ground surface, -27.5 feet NAVD88. The Discharger plans to deepen the borrow pit to -128 feet NAVD 88 to obtain additional soil volume for use in the landfill construction and operation activities.

Jepson Prairie Organics Composting Operation

132. The Jepson Prairie Organics composting operation was previously covered under WDRs R5-2016-0056 along with all other landfill operations at the facility. Since the adoption of those WDRs the State Water Quality Control Board has adopted the Compost General Order. The Discharger requested during the development of these WDRs that the JPO operation not be covered under individual WDRs as it has been in the past and instead be covered under the Composting General Order. Therefore Board staff is concurrently developing a Notice of Applicability to permit this onsite operation. The composting facility is also regulated under a composting permit issued by the LEA (Compostable Materials Handling Facility Permit), which currently authorizes the facility to operate on 39 acres; accept an average of 600 tons per day within a 7-day period but no more than 750 tons per day on any given day of composting materials; and to store up to 225,000 cubic yards of feedstock, active compost, and/or finished compost at any one time.

Waste Classification and Acceptance

133. The Facility's landfills are subject to federal Municipal Solid Waste (MSW) regulations promulgated under the Resource Consideration Recovery Act (RCRA) (42 U.S.C. § 6901 et seq.). Typically referred to as "Subtitle D," these regulations are now codified as 40 C.F.R. part 258 and implemented in part through the provisions California Code of Regulations, Title 27 (Title 27) and in accordance with State Water Resources Control Board (State Water Board) Resolution 93-62.

134. 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 waste management unit, 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 waste management units, or at Class II waste management units which comply with Title 27 and have been approved by the Regional Board for containment of the particular kind of waste to be discharged.

135. On 24 June 2016, the Central Valley Water Board adopted R5-2016-0056, classifying the Facility's WMUs as either Class II or Class III units. This Order continues such classifications, which are set forth above in **Table 1**.

136. Table 8 below summarizes the waste types currently accepted by each landfill unit and the waste pile. Further information about each waste type is described in the findings below.

Table 8: Waste Acceptance by Landfill Unit

Waste Type	LF-1	LF-2	LF-3 and LF-4	WP-9.1A
MSW	No	Yes	Yes	No
Inert C&D	Yes	Yes	Yes	No
Nonhazardous C&D, Commercial and Industrial	Yes	Yes	Yes	No
Designated C&D, Commercial and Industrial	No	No	Yes	No
Contaminated Soil (C-soil)	No	No[1]	Yes	No
Leachate and Landfill Gas Condensate	No	No	Recirculation	No
Asbestos Containing Waste	Yes	No	Yes	No
Treated Wood Waste	No	No	Yes	No
Telephone Poles	No	No	Yes	No

Waste Type	LF-1	LF-2	LF-3 and LF-4	WP-9.1A
Semi-Solids and Industrial Sludge	No	No	Yes	Dewatered WWTP Sludge Only
Dredge Spoils	No	No	Yes	No
Special Wastes[3]	No	No	Yes	No

Notes:

1. Lead-contaminated soil re-classified as “non-hazardous” by the Department of Toxic Substance Control and as approved by the Central Valley Regional Water Quality Control Board in 1993 and 1994 has been stockpiled on LF-2 ad may be used as foundation cover soil at closure. No additional C-soil is permitted to be accepted.
2. Leachate and landfill gas condensate recirculation may occur in compositely lined modules. Leachate may only be recirculated back to the area covered by the sump from which it was collected. See Discharge Specification B.5.
3. Special wastes as defined by Title 27 (e.g., triple-rinse pesticide containers, tires, large dead animals, medical wastes. Incinerator ash, and agricultural wastes).
4. LF-3 wastes may be placed on top of the LF-3 interface liner where the disposal location is vertically above LF-1 or LF-2. See Discharge Specification B.8.

137. The Discharger proposes to continue to discharge nonhazardous wastes including MSW in the Class III LF-2 and inert and nonhazardous construction and demolition debris (C&D) in the Class III landfills (i.e., LF-1 and LF-2).

138. The Discharger proposes to continue to discharge inert wastes, nonhazardous wastes including MSW, and asbestos-containing wastes to Class II waste management units at the facility. The Discharger also proposes to continue to discharge designated waste to Class II landfill units (i.e., LF-3 and LF-4) including household, commercial, and industrial (H/C/I) wastes; de-watered sewage sludge; industrial sludges; treated wood waste; dredge debris; slab/construction/demolition debris; commercial/industrial waste; glass cullet; asbestos containing waste and other non-hazardous or designated wastes. Wastes requiring special handling (“special wastes”, as defined in Title 27 section 21064 (see also Cal. Code of Regs., title 22, § 66261.120 et seq.)) (e.g., triple-rinse pesticide containers; tires; large dead animals; medical wastes; incinerator ash; and agricultural wastes) are also discharged to the Class II landfill units. These classified wastes may be discharged only in accordance with Title 27, Resolution 93-62, and Subtitle D as required by this Order.

139. Contaminated soil (C-Soil) discharged to the landfill are typically classified as designated waste and generally include petroleum-impacted soil; metals-impacted soil; pesticide or PCB-impacted soil; and/or soil mixed with incinerator ash. Class II landfill modules may accept C-Soil for disposal, as alternative daily cover (ADC), and as foundation layer for final cover. C-soil has been stockpiled on Class III LF-2 landfills previously. These WDRs authorize the discharge of C-Soil to Class II units LF-3 and LF-4, but no new C-Soils may be discharged to Class III units LF-1 or LF-2. In addition, all existing and future C-Soil stockpiles must be managed as designated waste, and require intermediate cover and stormwater controls. See Discharge Specification B.4.

140. Approximately 593,000 cubic yards of C-Soil and sludge are estimated to have been stockpiled at LF-2 and LF-3 since January 1993. These WDRs authorize the existing C-Soil stockpiles to remain on the disposal modules where they exist today, and authorize LC-soil to be used as a foundation cover for LF-2. These WDRs also authorize the discharge of C-Soil to Class II units LF-3 and LF-4, but no new C-Soils may be discharged to units LF-1 or LF-2. See Discharge Specification B.1.

141. Lead-contaminated soil (LC-soil) previously accepted from the City of San Francisco Metro Muni project, and re-classified as “nonhazardous” by the Department of Toxic Substances Control (pursuant to Section 66260.200(f), Title 22), and approved by the Central Valley Water Board on 28 September 1993 is stockpiled on Unit LF-2, module DM-2.1 beneath the DM-2.2 eastern side slope liner. Although DM-2.1 is a Class III unit and the LC-soil is a designated waste, the Discharger received approval from the Central Valley Water Board to stockpile LC-Soils on DM-2.1 from the Islais Creek Contract B Project and the Embarcadero Roadway project on 16 November 1994 and 25 February 1994, respectively. The LC-Soil stockpiles include long term stockpiles for future beneficial reuse as foundation soil for final cover and operational stockpiles for beneficial reuse such as ADC.

142. The Discharger also proposes to continue to discharge de-watered (i.e., all free liquids removed) wastewater treatment plant (WWTP) sludge for discharge to the landfill and for beneficial reuse in landfill operations as alternative daily cover. The Discharger accepts sludge only if the sludge is at least 20 percent solids if primary sludge, and 15 percent solids if a secondary sludge or a mixture of primary and secondary sludge. Sludge accepted at the landfill during the wet season is either discharged directly to the landfill with solid waste (i.e., co-disposal) or stored in an onsite waste pile (WP-9.1A). At the end of the wet season, the sludge is moved to, and temporarily stockpiled on, active module(s) where it will be beneficially reused as alternative daily cover (ADC) and/or admixed with clean soil for use as operations layer. Any sludge not dried and/or used during a dry season is winterized with intermediate cover for future beneficial use. The co-disposal ratio of dry refuse to sludge may not be less than

5:1 by weight. Sludge is also recycled onsite for construction uses. These WDRs allow the stockpiling of dewatered sludge on landfill modules that are Class II units. See Prohibition A.5.d. These WDRs allow the Discharger to continue discharging these semi-solid wastes to WP-9.1A and LFs-3 and 4 provided that the discharge complies with the applicable co-disposal provisions of this Order and Title 27 and Subtitle D regulations.

143. Under previous WDRs, sludge drying operations were also historically conducted at an onsite landfill treatment unit (LTU) immediately east and south of WP-9.1. The LTU was clean closed in 2017. Additionally, the eastern portion of WP-9.1, designated WP-9.1B, was also closed. WP-9.1A is still in operation.

144. The Discharger proposes to continue to discharge wastes containing greater than one percent (>1 percent) friable asbestos to LF-1 (DM-1A and DM-1B). The Discharger also proposes to discharge wastes containing greater than one percent (>1 percent) friable asbestos to LF-3 and LF-4. Wastes containing greater than one percent (>1 percent) friable asbestos is not allowed in LF-2. 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. Therefore the discharge of this waste is authorized for WMUs as specified in Discharge Specification B.1.

145. The Discharger proposes to continue to discharge treated wood waste in the composite lined modules LF-3 and LF-4. Treated wood waste is not allowed in modules in Units LF-1 or LF-2. Title 22 defines “treated wood” 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).

146. 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:

a. 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.

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

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

a. Reuse is on-site.

b. Reuse is consistent with FIFRA approved use of the preservative.

c. 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 and if a verified release containing one or more TWW constituents is detected from module where treated wood is discharged, the disposal of treated wood will be terminated at the module 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.

147. This Order authorizes the discharge of treated wood waste to composite-lined WMUs specified in Discharge Specification B.1, provided that the Discharger complies with Health and Safety Code sections 250150.7 and 25143.1.5; Title 22 section 67386.3; and the applicable SPRRs. The landfill may accept wood waste as described in H&S Code Section 25143.1.5 that is removed from electric, gas, or telephone service (i.e., utility poles) as it is exempt from the treated wood waste requirements.

148. Leachate production has fluctuated greatly since 2016, generally coinciding with rainfall and increased area of lined disposal modules. Total leachate generation for all units with LCRS systems from 2016-2020 is summarized in Table 9 below:

Table 9: Total Leachate Generation 2016-2020

Year	Gallons of Leachate Pumped from Landfill Units
2016	3.3 Million Gallons
2017	6 Million Gallons
2018	1.8 Million Gallons
2019	5.4 Million Gallons
2020	1.6 Million Gallons

The average daily pumping rate for leachate over the Second Half 2020 and First Half 2021 was 491 gpd at DM-1B, 176 gpd at LF-2, 840 gpd at LF-3, 1,582 gpd at LF-4, and 193 gpd at WP-9.1

149. Based on the available historical leachate monitoring data, shown in the tables below, leachate is considered a designated waste. Constituents identified through leachate sampling have been added to the COC list. See Attachment A.

Table 10: Min-Max Historical Leachate Data (ug/L, except where noted)

Unit:	LF-1						LF-2[2]		
	DM-1A[1]			DM-1B[2]					
Constituent:	Min	Max	Median	Min	Max	Median	Min	Max	Median
Ammonia (mg/L):	50	920	540	6.4	70	13	15	36	20
General Minerals (mg/L):									
Bicarbonate	710	5,500	3,300	595	2,100	1,000	1,030	2,100	1,700
Chloride	61	6,900	3,300	380	2800	634	490	6,300	3,100
Nitrate	ND	2	0.22	ND	7.79	0.1	ND	11	0.19
Sulfate	ND	130*	6	0.48	220	6.35	ND	2,300	76
Total Dissolved Solids	500	15,000	7,500	810	8,610	1,960	2,900	13,400	7,000
VOCs (ug/L):									
Alcohols and ethers	ND	760	0.61	ND	320	0.6	ND	840	1.8
BTEX Compounds	ND	35	3.05	ND	3.7	0.24	ND	16	0.70
Freon Compounds	ND	5.1	0.16	ND	2	0.16	ND	2	0.16
Halogenated VOCs									
1,1-Dichloroethane	ND	1	0.12	ND	2.2	0.5	ND	2.3	0.93

Unit:	LF-1						LF-2[2]		
	DM-1A[1]			DM-1B[2]					
Constituent:	Min	Max	Median	Min	Max	Median	Min	Max	Median
1,2-Dichloroethane	ND	0.88	0.17	ND	1	0.16	ND	1.4	0.355
Methylene Chloride	ND	1.7	0.28	ND	5	0.27	ND	6.5	0.3
Vinyl Chloride	ND	10	1	ND	1	0.16	ND	2.5	0.91
Other	ND	49	0.18	ND	25	0.17	ND	50	0.24
Ketones	ND	91*	7.10	ND	280	2.50	ND	31	4.10
Other VOCs	ND	500	1.15	ND	500	0.57	ND	500	0.8
Dissolved Metals (mg/L):									
Arsenic	ND*	0.2	0.028	0.00563	0.1	0.012	ND	0.1	0.015
Chromium (total)	0.00092	0.038	0.01	ND	0.01	0.01	ND	0.49	0.01
Chromium (Hex)	NA	NA	NA	ND	ND	ND	ND	0.0069	NA
Iron	1.3	11*	7	ND	17	6.2	0.29	4.90	1.40
Lead	ND	0.2*	0.012	ND	0.1	0.005	ND	0.1	0.005
Manganese	0.11	2.30	0.21	0.14	6.58	2.50	0.71	27.00	2.66
Mercury	ND	0.0002	0.000017	ND	0.00015	0.0002	ND	0.001	0.0002
Semi-VOCs (ug/L):	ND	83	0.34	ND	810	3	ND	800	4.8
Organo-Pesticides (ug/L):	ND	0.075	0.012	ND	40	0.48	ND	40	0.48

1. Based on leachate monitoring well data, 1996-2015 (unit has no LCRS).
2. Based on LCRS sump monitoring data, 1996-2015.
*. Outlier removed. Min = minimum, Max = maximum
ND – (Non-detect) – detection limits are variable
NA – not applicable, too few detections

Unit:	LF-3[1]			LF-4[1]			WP-9[1]		
Constituent:	Min	Max	Median	Min	Max	Median	Min	Max	Median
Ammonia (mg/L):	0.05	160	22	0.91	6,600	1,300	3.1	830	335
General Minerals (mg/L):									
Bicarbonate	430	2,400	1,200	360	19,000	4,200	440	4,300	1,500
Chloride	70	3,000	1,200	15	6,700	1,600	440	2,180	940
Nitrate	ND	170	0.096	ND	260	0.22	ND	950	17.5
Sulfate	ND	2,600	41	ND	1,800	20	180	4,280	868

Unit:	LF-3[1]			LF-4[1]			WP-9[1]		
Constituent:	Min	Max	Median	Min	Max	Median	Min	Max	Median
Total Dissolved Solids	630	7,200	3,540	44	22,000	4,800	1,900	16,300	5,200
VOCs (ug/L):									
Alcohols and ethers	ND	890	3.2	ND	8,600	3	ND	180*	1.2
BTEX Compounds	ND	350	0.61	ND	170*	9.10	ND	30*	0.50
Freon Compounds	ND	250	0	ND	90	0.22	ND	9	0.45
Halogenated VOCs									
1,1-Dichloroethane	ND	10.9	0.76	ND	18	0.75	ND	5.0	0.2
1,2-Dichloroethane	ND	5.0*	0.32	ND	29	2	ND	8	0.4
Methylene Chloride	ND	5.0*	0.31	ND	8.5*	0.48	ND	9.1	0.6
Vinyl Chloride	ND	7.3*	0.87	ND	17*	1.2	ND	6.8	0.31
Other	ND	550*	0.24	ND	300	0.24	ND	200	0.5
Ketones	ND	16,600*	6.50	ND	3,700	17.50	ND	180	13.00
Other VOCs	ND	2500	0.8	ND	5800	1.1	ND	5000	2
Dissolved Metals (mg/L):									
Arsenic	ND	0.235	0.012	ND	0.82	0.046	ND	46	0.033
Chromium (total)	ND	0.49	0.01	ND	1.7	0.03	ND	11	0.01
Chromium (Hex)	ND	0.0069	NA	ND	0.016	NA	ND	0.0068	NA
Iron	0.06	261.00	4.90	0.23	23.00	4.50	0.30	12.00	3.00
Lead	ND	0.662	0.005	ND	0.2	0.005	ND	12	0.005
Manganese	2.60	40.00	6.50	0.035	26.00	1.60	4.50	27.00	11.50
Mercury	ND	0.0018	0.0002	ND	0.0055	0.0001	ND	0.00028	0.002
Semi-VOCs (ug/L):	ND	1,000	4.9	ND	1700	3.8	ND	800	10
Organo-Pesticides (ug/L):	ND	100	0.48	ND	50	0.074	ND	50	0.48

1. Based on LCRS sump monitoring data, 1996-2015.
*. Outlier removed.
Min = minimum, Max = maximum
ND – (Non-detect) – detection limits are variable
NA – not applicable, too few detections

The MRP under these WDRs requires that the Discharger monitor leachate monthly for flow, semi-annually for monitoring parameters, and every 5 years for all constituents of concern.

150. The Discharger stores pumped leachate in above ground tanks. This WDR requires the Discharger to install secondary containment systems at these tanks to prevent leaks or spills of the liquid. Leachate is either pumped and collected and stored in on-site polyethylene tanks for off-site disposal to a permitted publicly-owned treatment works (POTW) plant, or returned to the composite-lined landfill from which it was generated.

151. As outlined above the characteristics and concentrations of the constituents of concern within the leachate qualifies as a designated waste as long as it remains within the approved containment system. The Discharger proposes to continue to return leachate and landfill gas condensate to the composite-lined landfill units from which they came. Title 27, section 20340(g) requires that leachate be returned to the unit from which it came or be discharged in a manner approved by the Regional Board. This section of Title 27 also references State Water Board Resolution 93-62 regarding liquids restrictions in 40 C.F.R. section 258.28 for MSW landfills. 40 C.F.R. section 258.28 states that liquid waste may not be placed in MSW landfill units unless the waste is leachate or gas condensate derived from the landfill unit and the unit is designed with a composite liner and an LCRS. Therefore, leachate and landfill gas condensate from composite lined units with an LCRS may only be returned to the unit from which they came. This Order includes requirements for returning leachate and landfill gas condensate back to composite-lined units such that the liquid waste is not exposed to surface water runoff, will not cause instability of the landfill, and will not seep from the edges of the units.

152. The LCRS for the respective disposal modules are serviced by a series of leachate collection sumps. A total of 18 leachate collection sumps are currently in service at various locations throughout the Landfill. The locations of these sumps are as follows:
    a. S-1: southwest portion of DM-1B
    b. S-2.1: south end of DM-2.1
    c. S-2.2A & S-2.2B: west and south ends of DM-2.2, respectively
    d. S-3.1, S-3.2 & S-3.3: east and south ends of DM-3
    e. S-4.1: east end of DM-4
    f. S-5.1A, S-5.1B & S-5.2: east and north ends of DM-5
    g. S-6.1: north end of DM-6
    h. S-7.2: south end of DM-7
    i. S-8.1 (temporary): south end of DM-8.1
    j. S-9: north end of DM-9.1
    k. S-9.1A: north end of WP-9.1A
    l. S-11.1 & S-11.2: south end of DM-11

153. In addition to the 18 LCRS sumps, nine leachate wells (LW-1 through LW-5 and LW-7 through LW-10) are installed in the northern portion of DM-1A. These wells were installed in several phases as part of corrective actions related to groundwater to waste separation issues in DM-1A.

154. The leachate collection sumps are equipped with automatic pumping systems. When present, liquid is extracted from the sumps and is either used as dust control on the lined portions of the Landfill or is transported off-site to various POTW facilities for disposal. The sumps are checked for liquid on at least a monthly basis.

155. Currently leachate pumped from the LCRS sumps of the landfill units is either disposed of offsite or returned to the unit from which it came using a recirculation system. LFG condensate recovered from the LFG extraction system of a unit is either pumped into the landfill LCRS sump(s) of that unit for recirculation with leachate or stored in tanks with leachate for offsite disposal. Each sump has a dedicated tank to ensure leachate is returned to the unit it was collected from. Currently, LF-3, DM-11 is the only unit/module undergoing leachate/condensate recirculation. Historically, up to 600,000 gallons of liquids was recovered and returned to DM-11 per year. Under Title 27 leachate cannot be recirculated at LF-1 or LF-2 as they are Class III units.

156. Leachate from the LCRS sumps on the west half of the site destined for offsite disposal is piped to a tank farm located on the northwest side of LF-3, DM-2.2, while leachate collected from LCRS sumps on the east half of the site is piped to a tank farm west of WP-9.1. See Attachment F: Current and Planned Units with Leachate Management Features Map. The tanks are periodically pumped and the leachate hauled by tanker truck to the Easterly Wastewater Treatment Plant in Elmira. The MRP under these WDRs requires that the Discharger monitor and report the volume of leachate (including any commingled LFG condensate) pumped from storage and hauled offsite each month.

157. The Discharger proposes to continue discharging leachate and LFG condensate to the existing recirculation operations at LF-3. These WDRs allow the Discharger to return landfill leachate and/or LFG condensate to the active MSW landfill unit from where it was generated, provided such MSW landfill unit was constructed with a composite liner system and LCRS.

158. These WDRs prohibit the discharge of leachate and/or LFG condensate from one unit to another. See Discharge Specification B.5.

Alternative Daily Cover / Intermediate Cover
(Operating Landfill Units)

159. 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.

160. In lieu of the daily cover required per Title 27, section 20680, the Discharger proposes to use an approved alternative daily cover (ADC) (see Title 27, §§ 20690, 20705) for all LF units, which consists of:; green waste materials/compost; ground wood, C&D fines, shredded tires, moisture conditioned ash and/or cement kiln dust, and mixtures of these wastes; and Geosynthetic fabric, blankets, and foam products. All ADC materials are stockpiled at or near the working face prior to use. In addition, Class II compositely lined LF units may also use dried sewage sludge/biosolids, and non hazardous C-Soil, dredge spoils, foundry sands, & contaminated sediments as ADC. The Discharger does not use any ADC materials for intermediate cover, except for biosolids as a soil amendment. These WDRs allow the Discharger to use these materials as ADC.

161. The proposed ADC has already been approved by the Local Enforcement Agency (LEA) and is hereby also approved by the Central Valley Water Board for use at the Facility.

162. In accordance with Title 27 section 20705, Discharger has demonstrated that its proposed ADC materials: (a) will minimize percolation of liquids through waste; (b) that the constituents and breakdown products are included in the water quality protection standard (c) are consistent with the classification of the WMUs to which they are to be applied. The approved ADC material constituents and breakdown products are also included as part of the WQPS set forth in the MRP.

163. The materials approved for use as ADC are as follows:

    a. Biosolids, depending on the moisture content and the consistency will be delivered near the working face of a consistency suitable for immediate use as ADC, pursuant to Title 27, Section 20690. If wet weather prohibits the immediate use of biosolids at the working face or the biosolids requires drying to reduce the moisture content it will be stockpiled, dried, and delivered to the working face for use as needed. Biosolids will be stockpiled within WP-9.1A during the winter rainy season or on top of lined LF-3 and LF-4 areas during the dry season. Stockpiled biosolids will be held to vector control standards

as required under Title 27, Section 20695. If odors or vectors do become a problem, the biosolids can be spread and dried on top of the landfill units they were stockpiled on during periods of no rain. This drying process will be facilitated with disking or other turning equipment.

b. Non-hazardous contaminated sediment, dredge spoils, and foundry sands will be delivered directly to the working face for use as ADC except when an excess of material is received. These materials will be stockpiled near the working face when not needed immediately for cover operations in LF-3 and LF-4. A Soluble Threshold Limit Concentration (STLC) analysis shall be performed on these materials prior to acceptance, as required by the MRP.

c. Shredded tires will be delivered directly to the working face for use as ADC except when delivery rates exceed daily usage needs.

d. Geosynthetic fabric or panel products (tarps) may be used as ADC in accordance with Title 27, Section 20690 and consistent with manufacturer specifications.

e. Foam products may be used as ADC in accordance with Title 27, Section 20690 and consistent with manufacturer specifications.

f. Moisture-conditioned non-hazardous ash and cement kiln dust materials. If it is not received moisture-conditioned, it will be treated on site to prevent windblown ash nuisances and conform to State Minimum Standards. Ash is not accepted on extremely windy days. The site manager determines when wind conditions are such as to prevent a nuisance or air quality problem for ash unloading.

g. Compost materials (i.e. green waste) may be used as ADC in accordance with Title 27, Section 20690(b)(8).

h. The use of Material Recovery Facility (MRF) Fines or Construction & Demolition (C&D) Fines as ADA material was approved by CalRecycle in a letter dated May 27, 2010, which was issued subsequent to the completion of a demonstration project conducted and monitored in concert with the LEA. MRF Fines and C&D Fines may be used as ADC in accordance with Title 27, Section 20690(b)(9).

164. ADC ready for application will be delivered to or near the working face. No more than 3,000 cy of ADC materials will be placed in a staging area adjacent to the working face to be applied at the end of a daily filling operation. ADC will be applied to the working face using site equipment and spread to produce a uniformly thick and compacted daily cover. The beneficial reuse of these materials will be tracked at the site.

165. 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 should 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.

Monitoring Program

Groundwater Monitoring Network

166. The groundwater monitoring network currently complies with the requirements of Title 27. As of the date of this Order, the groundwater monitoring network consists of the existing and proposed monitoring wells listed in Table 11 below, as well as Monitoring Requirement J.3. These points are shown on the facility map in Appendix E.

Table 11: Background and Point of Compliance Wells

Landfill Unit	Background Wells	Point of Compliance Wells
Landfill 1	G-7, G-8, P-1	G-9[1], G-10U[1], G-60A, MW-4
Landfills 2/3	G-59, 4BR	G-11[1], G-27[1], G-58[2]
Landfill 4	G-4R, G-17, G-18	G-16R, G-25R[2], G-28R[2], G-29R[2], G-30R[2], G-53[3], G-54[3], G-56, G-57
Waste Pile 9.1A	G-4R, G-17	CP-1S[4], CP-1D, CP-4S[4], CP-4D

Notes:
1: Shallowest wells G-9, G-10U, G-11, and G-27 will be sampled if there is sufficient water. If these wells are dry, then the corresponding next deeper well (G-9A, G- 10M, G-11M, G-27A) will be sampled, if there is sufficient water. If these corresponding deeper wells are also dry, then, if available, the next deeper well (G- 10R and G-11R) will be sampled.
2: Existing wells G-12, G-25, G-28, G-29, or G-30 will only be sampled if a concentration limit is exceeded at the corresponding upgradient replacement well.

3: Wells G-53 and G-54 will eventually be abandoned with the construction of future unit DM-8.3.
4: CP-1S and CP-4S are screened in perched zones, and are only required to be sampled if water is present.
5: If Board staff approves an updated monitoring network based on a Revised WQPS report in the future the monitoring network established in that formal approval letter supersedes the network described above.

167. The unsaturated zone monitoring network currently does not comply with the requirements of Title 27. These WDRs require the Discharger to submit an Unsaturated Zone Monitoring Report, see Time Schedule Item L.11. As of the date of this Order, the Facility's unsaturated zone monitoring network consists of the existing and proposed monitoring points listed in Table below.

Table 12—Unsaturated Zone Monitoring Network

Monitoring Point	Device Type	Program	Monitored Unit	Status
VZ-2.1	Suction Lysimeter	DMP	LF-2	Not Operational

See Glossary for definitions of terms and abbreviations in table.

168. As of the date of this Order, the Facility's surface water monitoring network consists of the existing and proposed monitoring points listed in Table 13 below. These points are shown in Attachment E: Facility Map.

Table 13—Surface Water Monitoring Network

Monitoring Point[1]	Location	Program	Surface Water	Status
SW-3	South side of culvert under Hay Road	DMP	Alamo Creek A-1 Channel	Background
SW-4	Upstream of Bird Sanctuary Pond outfall	DMP	Alamo Creek A-1 Channel	Background
SW-7	Downstream of Bird Sanctuary Pond outfall	DMP	Alamo Creek A-1 Channel	Detection

Monitoring Point[1]	Location	Program	Surface Water	Status
SW-8	Upstream of LF-3 east of borrow pit discharge	DMP	Bird Sanctuary Pond	Background
SW-9	Discharge into the Bird Sanctuary Pond	DMP	Bird Sanctuary Pond	Detection
SW-5	Bird Sanctuary Pond	DMP	Bird Sanctuary Pond	Detection

See Glossary for definitions of terms and abbreviations.

Notes:

1. GPS coordinates of location where sample was taken must be provided. The Discharger must sample from consistent locations, within 10 feet of previous samples.

169. As of the adoption of this Order the above-described networks, with the exception of the unsaturated zone, comply with the monitoring requirements of Title 27. (See Title 27, §§ 20415–20435.) Subsequent changes to these networks (if necessary) will be reflected in a new or Revised Monitoring & Reporting Program issued by the Executive Officer.

Corrective Action

170. For corrective action monitoring, the monitoring program specifies intra-well statistical and/or nonstatistical procedure (e.g., time series plots, trend analysis) to evaluate the effectiveness of corrective action. Title 27, Section 20430(g) requires that a Dischargers demonstrate that a corrective action has been completed (i.e., statistically show concentrations along Point of Compliance returned to compliance with the water quality protection standard) using a proof period as outlined by Title 27. During this time period the Discharger must demonstrate that all COCs of the release have been reduced to below concentration limits for no less than eight monitoring events distributed evenly over one year. The monitoring events may occur as frequently as once per month.

Impacts Detected in Welded Pan Lysimeters and Suction Lysimeters

171. The detection waste constituents outside the primary liner system (below the LCRS layer and sump) indicates a release. Detections of water containing waste constituents have occurred sporadically in various disposal modules in LF-2, LF-3, and LF-4 from 1994 to present. The investigations, findings, and corrective

actions taken in response to these findings are summarized in Findings 172-177 below. Investigations of recent detections of water containing waste constituents in welded pan lysimeters are ongoing.

172. VOC-impacted soil pore liquid was detected in LF-2's suction lysimeter (VZ-2.1) during numerous monitoring events conducted from 1994 through June 2010, after which attempts to obtain samples from the lysimeter have failed. Total VOC concentrations detected during this period averaged about 74 µg/L, consisting primarily of alcohols & ethers (45 µg/L) and ketones (21.3 µg/L), and low to trace concentrations of other VOCs (7.6 µg/L). Previous (1997) WDRs required that the Discharger investigate the release and gas controls were ultimately installed at the module as the primary corrective action measure.

173. VOC-impacted pan lysimeter liquid was first detected in 1999 and subsequently confirmed at DM-2.2 (PL-2.2A) and DM-11 (PLs-11.1 & 11.2). In May 2001, the Discharger submitted an Engineering Feasibility Study (EFS) for these modules in accordance with Title 27 CCR Section 20420(k)(6), based on the results of an Evaluation Monitoring Program (EMP) under previous WDRs Order No. 5-01-101. The EFS concluded that the VOC-impacted liquid detected in the pan lysimeters was likely contact surface/storm water that infiltrated the gravel capillary break layer from the interior sides of the modules or similar infiltrated surface water impacted by LFG.

174. PL-11.1 and PL-11.2 both had liquid detected in them in 2020, but had insufficient water to be sampled. It is unclear if the dedicated pump and tubing for PL-11.2 is functioning. The Discharger performed a down hole camera investigation but it was inconclusive. Since January 2020 organic vapors were detected above the trigger level (0.05 ppm; 50 ppb) in pan lysimeters PL-11.1 and PL-11.2.

175. Interim corrective action measures to address the releases at LF-2 and LF-3 have included covering exposed edges of the module during the rainy season, improved surface runoff controls, and pumping the pan lysimeter liquid back into the overlying LCRS sump. To eliminate the possibility of overcharging the LCRS sumps, the added pan lysimeter liquids were then immediately pumped from the LCRS sumps (by manually over-riding the liquid level controls) into the leachate tank farm storage. Long term corrective action measures implemented at the units have included the installation of several additional LFG monitoring probes in the LF-3 area (GP-2 through GP-8), borrow pit pumping to maintain groundwater separation in LF-1 area, and, in 2009, a site wide LFG extraction system in accordance with a May 2005 CAP approved in August 2005. These WDRs require that any liquid detected in a leak detection sump or pan lysimeter be handled in accordance with response measures described in the LCRS Sump O&M Plan submitted on 28 October 2016. Additional corrective action measures

may also be required in response to confirmation of a release. See Corrective Action Specifications.

176. VOC-impacted liquid has also been historically detected in pan lysimeters at several modules of LF-4, including DM-3, PLs-3.1 (since 2015) & 3.3 (since 2013); DM-4, PL- 4.1 (since 2006); and DM-5, PLs-5.1A (since 2001), 5.1B (since 2004), and 5.2 (since 2014); DM-7, PL-7 (since 2019); and DM-9, PL-9.1 since (2020). Gas impacts have also been detected in some of these welded pans. Since January 2020 organic vapors were detected above the trigger level (0.05 ppm; 50 ppb) in welded pan lysimeters and leak detection sumps LD-3.1, LD-3.3, LD-4.1, LD-6.1, WPL-3.2, WPL-3.3, WPL-6.1, WPL-7, and WPL-9. In a follow-up investigation of the release at DM-5, the Discharger concluded that the pan lysimeter liquid was not likely leachate or leachate-impacted based on differences in constituent concentrations and water chemistry. The Discharger attributed the source of the liquid detected in the pan lysimeters to possible surface water infiltration and implemented similar corrective action measures to those implemented at LF-3 (e.g., remove liquid from pans, covering exposed edges of module liner, LFG extraction). The Discharger has made similar findings based on various investigations of the releases at the other LF-4 modules.

177. The corrective action specifications of these WDRs stipulate the actions that the Discharger must take in response to the detection/confirmation of liquids in a leak detection device or pan lysimeter.

Disposal Module Design and CQA Issues

178. Despite the welded pans being designed to be completely sealed, there have been numerous instances of liquids entering welded pans. Liquids in welded pans have been detected in DM-3, DM-4, DM-5, DM-6, DM-7, DM-9, DM-11, and WP-9.1A. Sampling of the liquids determined that VOCs were present. TO-15 results show that many welded pans have also been impacted with landfill gas. Similar issues have occurred in disposal modules at other facilities that use the same design. Although several investigations have been completed, the only explanation provided by the Discharger is that stormwater runoff becomes impacted with landfill gas and then infiltrates the liner system, draining to the welded pan lysimeter. The Discharger arrived this conclusion based on liquids appearing in the pans immediately following heavy storm events and anion/cation analysis water quality comparison of the liquid in the pan to leachate and stormwater. To correct this issue the Discharger excavated anchor trenches around LF-3 and LF-4 and discovered the primary and secondary liners had not been welded together for extended lengths, particularly around DM-3.1, DM-4.1, DM-5.1, DM-11.1, and DM-11.2. After welding the liners together and repairing the anchor trenches there was a significant reduction in liquids being detected in nearby welded pans. While this supports the infiltrating impacted stormwater theory, the issue persists. These WDRs require the Discharger to further

evaluate the landfill gas extraction system to prevent groundwater and surface water impacts, and evaluate options for unsaturated zone monitoring devices. See Time Schedule item L.11.

179. In addition to the issue the issues described in Finding 178, the unit design also has compliance related at this facility and others that use the same disposal module design. While the design appears to adequate (other than the issue of the welded pan lysimeter not being an adequate unsaturated zone monitoring device), these issues appear repeatedly and persist. With the discovery of the unwelded liners in the anchor trenches at several units on site the quality of the CQA work is suspect. It also important to note that the consultant who designed these units performed the CQA inspections and certified the construction reports. Because of this conflict of interest and the known and suspected CQA issues these WDRs require the Discharger to hire an independent third party to perform all CQA related work for all future disposal modules and lined units. See Construction Specification D.13.

Separation Between Waste and Groundwater

180. By 1982, groundwater intrusion into the pit at DM-1A made it difficult to excavate additional soil for landfill operations. In an attempt to create an inward-gradient landfill for the DM-1A area, the Discharger constructed a slurry wall around the permitted disposal area on the western half of the site (i.e., LFs-1, 2 & 3 areas). The slurry wall was constructed using low permeability soil excavated from a borrow area within the slurry wall immediately west of DM-1A (i.e., future DM-1B area) and admixed with bentonite. Well logs indicated that the excavation for the wall was within what is now identified as the Upper Clay and the Upper Water Bearing Zone ranging from about 4 feet bgs on the east side of DM-1A to about 30 feet bgs on the west side of the borrow area. The slurry wall was keyed about 4 feet into the underlying clay layer. The elevation of the bottom of the slurry wall ranges from 6.5 feet NAVD88 (4 feet NGVD 29) to -27.5 feet NAVD88 (-30 feet NGVD 29). A de-watering trench was then installed within the slurry wall along the west side of the permitted area to dewater the pit. See Attachment G. Subsequent de-watering operations did not prevent groundwater intrusion into the pit, and by 1987 the Discharger had abandoned attempts to expand DM-1A's subsurface disposal pit by dewatering. The failure of the slurry wall to prevent groundwater intrusion into the pit indicated that the slurry wall was not an effective barrier to groundwater and/or that the aquifer underlying the unit may not have been perched as had been assumed. The slurry wall remains in place, with the exception of the majority of the northern side which was removed in 2017 during the construction of the French Drain which is further described in the Corrective Action section.

181. Between 2009 and 2013, groundwater was consistently reported by the Discharger to be approximately 15 feet above the waste in the area of LF-1. In

October 2014 the Regional Board issued Water Code Section 13301 Order R5-2014-0117-01 for this and other ongoing violations. The order required the Discharger to take corrective actions for unit DM-1 by delineating the extent of the high groundwater, completing an Engineering Feasibility Study, implementing the chosen option, and then conducting monitoring to demonstrate effectiveness.

182. In response to the 13301 Order issued under previous WDRs, the Discharger submitted a 15 May 2015 Revised Groundwater Separation Delineation Workplan to the Central Valley Water Board describing the methods it planned to use to determine the amount of separation of waste to groundwater at LF-1 and LF-4, DM-3.3 per the EAD/Ss approved under previous WDRs. The data developed from the Workplan was then used to prepare an Engineering Feasibility Study to evaluate alternatives to achieve compliance with the separation criteria. The Discharger submitted the EFS on 13 November 2015 and the corrective action proposals proposed therein were approved and incorporated into the October 2014 13301 Order, as amended by the Central Valley Water Board on 19 February 2016. The Amended 13301 Order requires, among other items, that the Discharger install six new piezometers to monitor groundwater separation at DM-1A and a French drain along the northern border of DM-1A to help dewater the module. The Order also required that the Discharger lower the outlet of the Bird Sanctuary in the southeast corner of the site to maintain the required separation for DM 3.3. The amended Order also requires that the Discharger operate and maintain the French Drain and Bird Sanctuary, once installed, in a way that maintains the separation of waste to groundwater in DM-1 and DM 3.3. The Amended 13301 Order also includes various monitoring and reporting requirements associated with these tasks.

183. In November 2015 the Discharger submitted an Engineering Feasibility Study to address the separation issues at DM-1. In that submittal the Discharger recommended the construction of a French drain dewatering system along the north side of LF-1 which would discharge into the borrow pit. Board staff approved this corrective action and the French Drain was completed in July of 2016.

184. The French drain was constructed in two sections running only the northern edge of LF-1. The western portion was constructed from western edge of the site entrance road to the borrow area when the drain terminates. The eastern portion of the trench runs from the east side of the entrance roadway to a sump approximately 450 feet to the west and is constructed with a bottom elevation of 3.6 feet NAVD 88. A pump station located on the east end of the western portion is set with a bottom sump elevation of 0.6 feet NAVD 88. A perforated pipe encased in gravel and a filter geotextile was installed along the base of waste observed in the south side of the excavation. This pipe has been connected to the landfill gas system so any future gas impact can be immediately addressed. As an additional protective measure, a 40-mil high density polyethylene (HDPE)

geomembrane was installed to provide a barrier to minimize the potential for leachate and landfill gas to migrate north of DM-1.

185. The French Drain significantly lowered groundwater elevations beneath LF-1. However the required 5 feet of separation was not achieved across the entire unit at all times. This was in violation of Item B of the WDRs and 13301 Order. At the time the compliance elevation for DM-1A was 2.5 ft NAVD 88/0.0 MSL based on limited available information about the construction of the unit and previous. The Discharger voluntarily performed a base of waste investigation DM-1A to better delineate the base of waste morphology and propose a more representative compliance elevation. Borings were advanced through the waste mass in 19 locations within the unit and trench excavations were performed in 7 locations near the edges of the unit. Seven of the borings were completed as landfill gas wells. The elevation at which native material was encountered varied greatly, and in general supported the theory that excavation of the area or trench and fill type operations had occurred prior to beginning waste acceptance in 1964, which were typical landfilling practices at that time. Based on the 2018 investigation, waste was discovered as low as 12.67 feet NAVD 88. Because of the measured depths to native soil and the variability in these depths Board staff determined that the most appropriate action was to set the base of waste elevation for the entire DM-1A unit at 14.2 feet NAVD 88, which reflected the deepest waste found. It is possible that waste exists deeper than this elevation, but the available data suggests the vast majority of the unit contacts native soil at a higher elevation. Therefore, the maximum allowable groundwater elevation under the entire DM-1A unit is 7.67 feet NAVD 88.

186. In addition, nine leachate wells (LW-1 through LW-5 and LW-7 through LW-10) were installed in the northern portion of DM-1A in several phases as part of corrective actions related to groundwater to waste separation issues in DM-1A. These wells are pumped out to remove liquid from the waste and reduce the migration of leachate to groundwater and production of LFG.

187. At the time that these WDRs are being developed DM-1A has not achieved the 5 feet of separation required across the entire unit at all times. Therefore, the unit continues to be in corrective action. Therefore, this WDR also requires additional investigation, monitoring, and pumping from leachate wells installed within DM-1A to address this requirement. See Time Schedule Item L.14. However, since the Discharger has implemented groundwater controls, will perform leachate pumping, and will install a prescriptive final cover, Board staff recommend the recission of the Amended 13301 Order upon adoption of this Order.

188. Quarterly groundwater elevation monitoring data for LF-4 on the east half of the site collected in July of 2021, as reported by the Discharger in the Second Quarter 2021 Groundwater Separation Report, is presented below along with groundwater separation distances at each LCRS sump of each unit/module.

Adequate separation appeared to exist during this period at all landfill units/modules on the western half of the site, with the exception of DM-1 as discussed above. Groundwater elevations are interpolated based on nearby monitoring devices unless otherwise indicated. Required groundwater separation was achieved in all units in the western portion of the site during this monitoring event.

Table 14—Reported Separation of Waste to Groundwater, LF-4, April 2021

Module or Piezometer Location	Leachate Sump ID	LCRS Sump or Base of Waste Elevation[1] (feet-NAVD88)	Groundwater Elevation[2] (feet-NAVD88) as of 19 April 2021	Approximate Separation (feet) as of 19 April 2021	Required Separation (feet)
DM-3.1	S-3.1[1]	22.8	17.61	5.19	2.5
DM-3.2	S-3.2	22.4	17.1	5.3	2.5
DM-3.3	S-3.3[2]	23.4	19.15	4.25	2.5
DM-4.1	S-4.1	22.9	17.2	5.7	2.5
DM-5.1A	S-5.1A	24.5	17.4	7.1	2.5
DM-5.1B	S-5.1B	24.3	16.9	7.4	2.5
DM-5.2	S-5.2	24.5	18.4	6.1	2.5
DM-6.1	S-6	25.6	19	6.6	2.5
DM-7.2	S-7	24.7	18.6	6.1	2.5
DM-8.1	S-8.1	36.0	18.1	17.9	5
DM-9.1	S-9.1	30.0	19.2	10.8	5
WP-9.1A	S-9.1A	27.8	18.9	8.9	2.5

Notes: 1. PZ-S3.1B data used.
2. PZ-S3.3 data used.

189. The eastern half of the site is not influenced by pumping from the borrow pit and no dewatering of modules on the eastern half of the site has been historically conducted. In 2016 the outfall of the Bird Sanctuary was lowered under the Amended 13301 Order in an attempt to lower local groundwater. Quarterly groundwater elevation monitoring data for on the west half of the site collected in July of 2021, as reported by the Discharger in the Second Quarter 2021 Groundwater Separation Report, is presented below along with groundwater separation distances at each LCRS sump of each unit/module. Groundwater elevations are interpolated based on nearby monitoring devices unless otherwise indicated. Required groundwater separation was achieved in all units in the western portion of the site during this monitoring event except for unit DM-1A.

Table 15—Reported Separation of Waste to Groundwater, LFs 1, 2, and 3, April 2021

Module or Piezometer Location	Leachate Sump ID	Compliance Elevation (feet-NAVD88)	Groundwater Elevation (feet-NAVD88) as of 19 April 2021	Approximate Separation (feet) as of 19 April 2021	Required Separation (feet)
DM-1A	--	7.67	13.08[1]	-5.41	5
DM-1B	S-1	8.1	0.14[2]	7.96	5
DM-2.1	S-2.1	25.3	7.9	17.4	3
DM-2.2A	S-2.2A	28.6	-4.8	33.2	2.5
DM-2.2B	S-2.2B	28.2	3.8	24.4	2.5
DM-11.1	S-11.1	27.8	11.9	15.9	2.5
DM-11.2	S-11.2	27.2	13.8	13.4	2.5

Notes:1. Highest groundwater elevation observed in P-1 on eastern boarder of unit. PZ-DM1N measured 11.67 in the northeast corner of the unit and PD-DM1SE measured 11.79 in the southeast corner of the unit.
2. Groundwater data from PZ-S1.

190. The Discharger has been reporting groundwater elevations by interpolating to the base of waste compliance point using 0.2-foot contour intervals (except for S-1 and S-3.3). WDRs R5-2016-0056 Provision I.9.b required, in part, the installation of piezometers adjacent to each LCRS sump of each classified unit to measure the groundwater elevation. However due to changes in the Site Conceptual Model this work was not completed. In addition, the vibrating wire transducers installed around DM-1 to monitor separation are no longer functioning, and piezometers are not appropriately placed or screened based on the updated SCM to evaluate compliance as required by these WDRs. These WDRs continues this requirement for the Discharger to submit a workplan to install piezometers within or at the compliance elevation adjacent to all sumps that don't currently have them, which will be used in the future to determine compliance with separation requirements rather than interpolation of groundwater contours. See Time Schedule Item L.12.

191. The borrow pit is proposed to continue to be excavated to provide soil for operations and closure of landfill units (See Findings 130 and 131 for details). The pumping of surfacing water from the borrow pit is and will continue to be a critical part of maintaining waste to groundwater separation in the western portion of the facility long after the landfill closes. As such the cost of monitoring, maintenance, pumping, and permitting of the borrow pit is required to be included in the FC/PCMP financial assurance cost estimate.

Nitrate Plume and Remediation Efforts

192. In July 2000, nitrate-N-impacted soil pore liquid (about 395 mg/L) was detected in both pan lysimeters beneath WP-9.1 and subsequently confirmed as a release from the module. An electrical leak location survey conducted under a June 2001 EMP found a liner leak (about 4 inches by 6 inches) on the eastern side of the module that may have allowed leachate to enter the capillary break layer and/or the pan lysimeters. Interim corrective action measures included removal of the liquid from both pan lysimeters (about 6,900 gallons total), repair of the liner leak, and covering the exposed edges of the landfill module liner system with plastic sheeting to reduce the possibility of surface water from entering the capillary break layer. Additional investigation was recommended.

193. The 2002 EMP also confirmed nitrate-N impacts to groundwater up to 30 mg/L in monitoring well G-21, which had recently been installed. In response, the Discharger installed new pumps, larger leachate storage tanks, additional LCRS pipes in the operation layer, and improved off-site leachate disposal capabilities. Grab groundwater samples obtained from temporary probes installed downgradient of well G-21 and adjacent to the northeast corner of WP-9.1 indicated lower, but still elevated, nitrate-N concentrations compared to background concentrations. The grab groundwater analytical results indicated that the area of nitrate-N impacts to groundwater is limited to the area immediately surrounding and approximately 150 feet downgradient of G-21.

194. Long term corrective action measures implemented at WP-9.1 in response to the groundwater release included installation of groundwater extraction well G-22 (about 10 feet downgradient of G-21) to remediate the release and two additional monitoring wells, G-23 (adjacent to G-21, but screened in the next lower sand layer) and G-24 (about 200 feet downgradient of G-21) to monitor the effectiveness of the corrective action. Extraction of groundwater from well G-22 started up in June 2003. Between July 2014 and July 2015, approximately 1.07 million gallons of impacted groundwater was pumped from G-22 at an average extraction rate of about 2.0 gpm, which was close to the design extraction rate. Groundwater extracted from G-22 is either stored/used onsite for dust control or hauled to an offsite WWTP for disposal.

195. An April 2002 follow-up EMP investigation (i.e., to define the nature and extent of the release) found nitrate-impacted soil below the landfill capillary break layer and in an area of erosion along the northeast corner of the module. The findings indicated that leachate had likely overflowed out of the module after exceeding the elevation of the WP-9.1 liner along the northeast and northwest perimeters. Additional corrective action measures included excavation of approximately 1,500 cubic yards of leachate-impacted soil and lining the module containment berms to seal off the LCRS layer so as to prevent future overflow of leachate from the module.

196. In 2012, the Discharger installed groundwater monitoring well G-31 as a replacement for well G-14, which had been destroyed to allow for construction of DM-6. The groundwater sampling following installation indicated a nitrate-N concentration of 29 mg/l in the well, which is above the 5 mg/l concentration limit for nitrate. Nitrate-N exceedances (17 mg/L) were also detected on the west side of the site in well 4BR also installed and sampled in 2012. In response to this detection, the Discharger evaluated the feasibility of a permeable reactive barrier trench for remediation of nitrate in this area. On 8 March 2013, Water Board staff issued a Notice of Violation (NOV) to the Discharger for the nitrate-N violations in these and other nearby wells. The NOV required, in part, that the Discharger perform a site investigation to delineate the nitrate-N releases and to establish a corrective action program.

197. In response to the NOV, the Discharger conducted a June 2013 investigation to delineate the nature and extent of the nitrate-N release, and defined elongated, nitrate- N plumes on the east and west sides of the site oriented in the direction of groundwater flow. Both identified nitrate-N plumes were downgradient of the Composting Area, WP-9.1, and LTU areas which were identified as possible sources given that they handle wastes/materials containing high concentrations of nitrogen compounds and that previous leaks and/or spills were documented from these units, including holes in the compost pond liners. Well G-31 was subsequently abandoned in June 2013, to allow for construction of DM-4.3.

198. Water Board staff subsequently approved a revised CAP proposing in-situ bioremediation for the nitrate-N releases via subsurface injection of an amendment to stimulate bioremediation based on a September 2013 EFS. The CAP required the Discharger to obtain coverage under General Order R5-2008-0149-056 (General Waste Discharge Requirements for In-situ Groundwater Remediation at Sites with Volatile Organic Compounds, Nitrogen Compounds, Perchlorate, Pesticides, Semi-Volatile Organic Compounds and/or Petroleum Compounds). A Notice of Applicability for the corrective action under General Order R5-2008-0149-056 was issued by the Executive Officer on 17 December 2014.

199. The Discharger initiated groundwater remediation under the above General Order in May 2015. The groundwater remediation program included the injection of 20 percent sodium lactate into shallow groundwater in the affected areas to biologically degrade the nitrate. Injection points were spaced at approximately 70-foot intervals within rows spaced approximately 50 feet apart. The sodium lactate injections were performed over a two-month period using temporary, push-probe (i.e., Geoprobe) borings, which were grouted after extraction. The injection process was completed in May 2015. Six groundwater monitoring wells (G-32 through G-37) were also installed in treatment, transition, and compliance monitoring zones to monitor the effectiveness of the corrective action under MRP R5-2008-0149-056 of the General Order.

200. In 2015 the Discharger began planning clean closure activities for WP-9.1B and the LTU in order to develop that area for DM-9.1. Removal of all waste, liner components, and impacted soil down to the water table was completed and certified in the November 2016 *Final Clean Closure Certification Report for the Eastern Portion of Waste Pile 9.1 and Adjacent Land Treatment Unit* report. The area was backfilled with clean fill in preparation for development of DM-9.1.

201. During clean closure the Discharger determined that the bioremediation was not remediating the nitrate plume fast enough to reach the 5 mg/L limit prior to the scheduled development of disposal module. In response in January 2016 the Discharger submitted a work plan proposing to the install of a total of 22 temporary soil borings on grid patterns on the eastern half of WP-9.1 (i.e., WP-9.1B) and in the LTU area. Each boring would be advanced to first encountered groundwater and cased with 1-inch PVC. Grab groundwater samples would then be collected from each boring and analyzed for Nitrate-N and Nitrite-N. Step-out boring installation and sampling would then be conducted from all unbounded borings showing Nitrate-N exceedances to delineate the plume. Board staff approved this plan and the work was completed.

202. On 4 November 2016 the Discharger submitted the *Interim Corrective Action Measures* (ICAM) *Workplan at Former Waste Pile WP-9.1B and the Adjacent Land Treatment Unit* to implement targeted groundwater extraction using temporary wells. Board staff approved the plan and groundwater extraction began from six wells within the footprint of the former WP-9.1B and LTU in April 2017. The plan also included pump tests, aquifer tests, and examination of borelogs from extraction wells and piezometers to better target high conductivity zones and hot spots to increase the efficacy of the remediation effort. Three additional extraction wells were installed just south of the former LTU, and two more in the footprint of future DM-8.1 to address hot spots in June and September 2017, respectively.

203. ICAM efforts within the footprint of DM-9.1 were effective, but not enough to meet the 5 mg/L limit in those areas prior to the development of DM-9.1. However, because the Discharger has made the Mandatory Clean Closure Attempt, Title 27 Section 21410 (a) allows for units to be closed as a landfill or as a LTU in lieu of clean closure. The Discharger proposed to abandon the clean closure attempt in this area and instead close the area as a land treatment unit, allowing them to construct a new unit within the footprint of future unit DM-9.1 as permitted by Construction Specification E.11 of the 2016 WDRs. In April 2018 the nine extraction wells within the footprint were abandoned, and DM-9.1 was constructed. A cumulative total of 446 pounds of nitrate were extracted between April 2017 and April 2018.

204. Because the Discharger did not achieve compliance with Monitoring Specification H.7 of the 2016 WDRs in the area of the former LTU and WP-9.1B, those units

will remain in corrective action.as constructed that summer making clean closure impossible to complete. The Discharger proposed in the *H.7 Workplan* to use Monitored Natural Attenuation (MNA) as a corrective action going forward. Board staff reviewed this proposal, and determined that Recology needs to propose a more aggressive corrective action. On 29 June 2018 the Discharger submitted a *Former LTU and WP-9.1B Closure Corrective Action Plan* outlining further steps to ensure remediation of the nitrate impacted groundwater in the footprint of DM-9.1. These steps included the installation of 8 monitoring wells around the compost leachate ponds to identify potential sources; maintaining the precipitation and drainage control systems, and; continue ground water and unsaturated zone monitoring. Final nitrate as N concentrations of monitoring wells and piezometers prior to removal are between approximately 1 and 25 mg/L. The Discharger included a Contingency Plan in the H.7 Workplan, stating that an engineering feasibility study (EFS) will be conducted to evaluate remedial action alternatives for DM-9.1 if concentrations of nitrate are detected above the concentration limit of 5 mg/L at one or more of the downgradient POC wells on the east and southern perimeter of LF-4. To date these wells have not shown increasing trends and are below the 5 mg/L limit.

205. In March 2019 the Discharger terminated ICAM activities in the footprint of DM-8.1. Between 4th Quarter 2017 and 1st Quarter 2019 nitrate concentrations in the two monitoring wells near the extraction wells had increased from 4 to 6 mg/L and from 6 to 22 mg/L, suggesting the wells were connected to high conductivity lenses in communication with nitrate hot spots. A cumulative total of 125 pounds of nitrate were extracted between October 2017 and March 2019. The Discharger proposed termination of the ICAM program within the future DM-8.1 footprint and monitored natural attenuation (MNA) as the ongoing corrective action. At the time of removal monitoring wells showed nitrate as N concentrations of between 6 and 22 mg/L. The Discharger proposed to implement the Contingency Plan outlined in the *H.7 Workplan* if concentrations of nitrate are detected above the concentration limit of 5 mg/L at one or more of the downgradient POC wells on the east and southern perimeter of LF-4.

206. On 1 March 2018 the Discharger submitted the *Interim Corrective Action Measures Workplan for Future Disposal Modules DM-2.3 and DM-11.3* which proposed to expand the ICAM project to the footprints of future DM-2.3 and DM-11.3 and remediate the western moving plume. Board staff approved this plan and extraction from two wells began in October 2018. A cumulative total of 663 pounds of nitrate were extracted from this area as of March 2021. Concentrations in monitoring wells have generally increased since extraction began, although several wells are now showing decline suggesting the remediation is effective. Extraction is ongoing in this area.

207. ICAM activities are ongoing within the footprint of future units DM-2.3 and DM-11.3. Continued corrective action and monitoring of the eastern plume beneath

LF-4 is required by these WDRs. See Attachment L: Nitrate-N Plume Map for current plume delineation.

208. These WDRs require the Discharger to implement the Contingency Plan described in the H.7 Workplan and submit an engineering feasibility study (EFS) to evaluate remedial action alternatives for DM-8.1 and DM-9.1 if concentrations of nitrate are detected above the concentration limit of 5 mg/L at one or more of the downgradient POC wells on the east and southern perimeter of LF-4. See Monitoring Specification J.3.

Landfill Gas Controls

209. The Central Valley Water Board, CalRecycle and the California Air Resources Board all have an interest in the control of landfill gases. CalRecycle is primarily concerned about the threat of methane gas creating an explosive environment in the facility buildings or any nearby building. The California Air Resources is primarily concerned in the release of greenhouse gases (methane) into the atmosphere. The Central Valley Water Board is primarily concerned with the migration and interaction of landfill gas (methane, VOCs, and inorganics) with the underlying groundwater.

210. On 24 August 2005, Water Board staff issued a letter to the Discharger requesting that the Discharger submit design plans for installation of a landfill gas (LFG) extraction system to control LFG from LFs-2, 3 and 4 (DMs-2.1, 2.2, 11, and 5.1) at the facility. The letter was issued in response to evaluation monitoring reports confirming the presence of LFG in the unsaturated zone and LFG impacts to groundwater and/or pan lysimeter liquid at these units. The letter approved a work plan for a further corrective action investigation to design the system and specified a 15 September 2006 due date (ultimately extended to February 2008) for installation and startup of LFG extraction.

211. Water Board staff approved design plans for the proposed LFG extraction system submitted by the Discharger in a 2 November 2007 letter. The approved design included installation of nine LFG extraction wells, lateral and header piping, condensate sumps, a candlestick flare station, and other facilities. Carbon filtration canisters to remove VOCs from the gas stream were subsequently added to the design and constructed. The carbon filtration system was subsequently replaced with a gas-to energy (GTE) plant, as described below.

212. The LFG extraction system started up in March 2009 and was subsequently expanded to address LFG issues at LF-1 and additional module development at LFs-3 & 4. At present, the LFG extraction system includes a total of 66 LFG extraction wells (11 at LF-1, four at LF-2, 19 at LF-3, and 30 at LF-4), five LFG condensate sumps, and associated collection piping. The LFG collection lines are also tied into the 3 leachate monitoring wells at DM-1A and 13 LCRS sump

risers at the units. The system is drive by blower motors in a 1.6 megawatt onsite gas-to-energy (GTE) plant where extracted LFG is converted to electrical energy for offsite export. The GTE plant also includes a gas combustion engine and electrical generators. The two enclosed flares are used for stand-by purposes and have a 3,000 SCFM blower. The GTE plant's blower has a variable frequency drive set to operates at a maximum flow of about 580 SCFM. Additional LFG collection facilities will be installed at the site, as necessary, to meet landfill development and corrective action needs. See Attachment I: Landfill Gas Collection and Control Systems Map.

213. Since 2009 additional extraction wells have been installed. The LFG collection system currently consists of 121 vertical landfill gas extraction wells. In addition, LFG is collected from supplemental locations at 15 leachate sump risers, 10 combination leachate/gas extraction wells, and 36 perimeter gas collectors. Wells are currently installed in DM-1, DM-2, DM-3, DM-4, DM-5 DM-6, and DM-11. Perimeter landfill gas extraction systems have been installed in DM-3.1, DM-4, DM-5, and DM-11. Connection of the LCRS riser pipes to the LFG collection header allow the collection of LFG from the base of the modules thereby providing additional groundwater protection from potential LFG migration. The wells are connected to a header line that directs the landfill gas towards an enclosed landfill gas flare and landfill gas-to-energy facility. The Discharger plans to install additional wells in these areas and future areas of the landfill as needed to collect generated LFG.

214. The Discharger also operates a flare to dispose of LFG not combusted in the GTE Plant. The flare capacity is currently limited by the sulfur dioxide emission limit of 150 pounds per day. To comply with the SO2 emissions limit, the average flow rate of LFG to the flare varies based on the LFG concentration of sulfur as H2S. An H2S removal system was installed in July 2017 to reduce the concentration of H2S in the LFG combusted in the flare and allows the flare to operate at full capacity without exceeding the current SO2 emission limit.

215. The landfill gas extraction system collected 1,004,000,000 cubic feet of LFG over 7858 hours of operation in 2020. This equates to approximately 21.5 hours of active extraction per day at 2,130 SCFM. Proportionately higher LFG extraction rates are anticipated as the landfill expands. Previous WDRs predated installation of the LFG system at the site and therefore did not require LFG extraction monitoring. Given that an LFG extraction system has since been installed at the site, the monitoring program in these WDRs requires that the Discharger conduct semiannual LFG extraction monitoring for parameters and constituents, including VOCs. The Discharger is also required to adjust or improve the LFG extraction system, as necessary, if monitoring data indicates that it is not preventing gas migration from a unit/module.

216. Recent detection of LFG and LFG impacted liquid in the welded pan lysimeters has again raised concerns about the efficacy of the LFG collection system. A number of low level VOC detections across the site have occurred in groundwater as well, although in all cases retests yield non detect results or the detection did not occur again in the subsequent sampling event. However these detections together indicate the LFG system may not be capturing all gas at all times. Therefore these WDRs require the Discharge to evaluate the current LFG controls and propose upgrades as needed. See Time Schedule Item L.15.

Enforcement and Amended 13301 Order

217. Various directives (e.g., Notices of Violation, Executive Officer Orders) have been historically issued to the Discharger in response to the releases described above and other violations of existing or previous WDRs. Discharger responses to such directives have typically included implementing investigations and monitoring, repairs or improvements, corrective action, or responses to compliance schedules in revised WDRs.

218. On 9 October 2014, the Board issued Water Code Section 13301 Order R5-2014-0117 (amended on 19 February 2016) to the Discharger for various WDR violations and compliance issues, including composting operations, groundwater separation, precipitation and drainage controls, flood protection, and interim slope stability. Technical reports required under the Amended 13301 Order included, but were not limited to, the following:

    a. Composting
        i. A Compost Area Storm Water Modification Technical Report;
        ii. A Compost Ponds Reconfiguration Technical Report; and
        iii. A Food Waste In-Vessel Composting Technical Report, and
        iv. A Compost Leachate Dust Control Technical Report; or (in lieu of ii, iii and iv)
        v. An Amended RWD requesting revision of composting requirements in the WDRs
    b. Groundwater Separation
        i. Quarterly groundwater separation reports;
        ii. CQA reports, including as-built drawings showing the bottom elevation of all units;
        iii. A Groundwater Separation Delineation Workplan;
        iv. An Engineering Feasibility Study to address groundwater separation at DM-1 and DM-3.1;
        v. A Groundwater Separation Implementation Report
    c. Other Reports
        i. A Runoff and Drainage Controls Technical Report;
        ii. A Temporary Fill Slope Stability Technical Report;

iii. A Flood Protection Technical Report; or, in lieu of iii, An Amended RWD requesting revision of flood control requirements in the WDRs Discharger responses to the 13301 Order, including technical reports submitted under the 13301 Order, are described or referenced in the applicable Findings of this Order.

219. The Discharger has submitted all reports required by the Amended 13301 Order, and Board staff has found these reports to be complete. Cited compliance issues with the compost operation have been resolved with the exception of a leak location survey of the compost ponds which will be required under the NOA for the Compost General Order issued concurrently with this Order. While the groundwater separation issues persist at the site as described in the Groundwater Separation and Corrective Action Sections, the Discharger has made significant efforts to increase separation by installing the French Drain system at LF-1, lowering and pumping the borrow pit, and modifying the outfall of the bird sanctuary. Because these actions have changed groundwater flow and because of the improved understanding of site hydrogeology, some of the requirements of the Amended 13301 Order have served their purpose to bring the Discharger into compliance with separation requirements while other requirements need to be updated accordingly. Therefore Board staff recommend the recission of the Amended 13301 Order upon adoption of this Order, and further actions to address separation issues with the updated understanding of the site will be required by these WDRs.

New Unit Construction

220. On 17 June 1993, the State Water Board adopted Resolution 93-62 implementing a State Policy for the construction, monitoring, and operation of MSW landfills that is consistent with the federal municipal solid waste regulations promulgated under 40 Code of Federal Regulations section 258 (Subtitle D). Resolution 93-62 requires the construction of a specified composite liner system at new MSW landfill units 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.

221. Title 27, section 20080(b) allows the Central Valley Water Board to consider the approval of an engineered alternative design (EAD) to the Title 27 prescriptive standard. In order to approve an engineered alternative in accordance with Title 27, sections 20080(c)(1) or (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).

222. 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.

223. Liners for new Class II WMUs (landfills and surface impoundments) must be designed and constructed to contain fluids (e.g., leachate, waste, and landfill gas condensate), to prevent the migration of waste to adjacent geologic materials, groundwater, and surface water. (See Title 27, §§ 20310(a), 20330(a).) Liners for new Class III WMUs (landfills) must be designed and constructed to contain fluids (e.g., leachate, waste, and landfill gas condensate), so as to be capable of preventing degradation of groundwater and surface water, even with inadequate site characteristics. (See Title 27, §§ 20310(c), 20330(a).)

224. This WDR carries over the requirement of WDRs R5-2016-0056 that all future units be constructed and operated to the Title 27 prescriptive standard of 5 feet of separation between waste and groundwater. See Construction Specification D.5.

225. 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 Board responded, in part, that “a single composite liner system continues to be an adequate minimum standard” however, the 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.”

226. In a letter dated 17 April 2001, the Executive Officer notified Owners and Operators of Solid Waste Landfills that “the Board will require a demonstration that any proposed landfill liner system to be constructed after 1 January 2002 will comply with Title 27 CCR performance standards. A thorough evaluation of site-specific factors and cost/benefit analysis of single, double and triple composite liners will likely be necessary.”

227. The Discharger submitted a Liner Performance Demonstration Report for DM-4.1 and Future Class II Liner Systems dated 15 April 2003. The base liner design for Disposal Module 4.1 (DM-4.1) and future Class II disposal modules at Recology Hay Road Landfill was proposed as follows (from top to bottom):

- 12-inch thick operations layer;
- 8-oz. Geotextile filter layer;
- LCRS gravel layer at least 6 inches thick;
- 60-mil HDPE geomembrane;
- 2-foot thick compacted clay liner with a permeability of 1x10-7 cm/s or less;
- 6-inch thick foundation soil layer;
- Leak detection geocomposite;
- 60-mil high density polyethylene (HDPE) geomembrane liner; and
- Compacted subgrade comprised of fined-grained soils.

The side-slope liner system was proposed as follows (from top to bottom):

- 1.5-foot minimum operations layer;
- LCRS geocomposite;
- 60-mil HDPE geomembrane;
- A geosynthetic clay liner (GCL) with 30-mil geomembrane; and
- Compacted subgrade comprised of fined-grained soils.

The Discharger proposed to provide comprehensive construction quality control during the liner system construction, complete an electrical leak location survey to verify the integrity of the primary liner system, and install LFG collection pipes within the LCRS to control LFG in the future, if necessary.

228. The demonstration compared efficiencies and leakage potential of six different liner system designs. A total leakage potential of 1.04 gallons was calculated throughout the life of the landfill (operations and 30-year post-closure period) for the 14-acre (DM-4.1) cell. In addition, a cost-benefit analysis was performed which showed that additional liner components would cost significantly more without significantly less leakage potential. As such, the demonstration concluded that a more stringent liner system is not warranted since the proposed system will meet the performance requirements of Title 27 CCR because it exemplifies the prescriptive standard with an additional leak detection component.

229. All components of the LCRS layers at DM-1B and LFs-2 through 4, including gravel or geocomposite blanket layers, lateral and/or header piping, LCRS sump, control systems, and handling facilities were designed to meet Title 27 performance standards using appropriate engineering methods and models (e.g., Hydraulic Evaluation of Landfill Performance (HELP) Model Version 3.07, pipe flow calculations).

230. On 28 October 2021 the Discharger submitted a Landfill Liner Performance Demonstration Update. The update was requested by Water Board staff in response to numerous issues with the design as discussed in the Corrective

Action section and some modifications to the design since 2003. The 2003 Liner Performance Demonstration was not updated, but included a statement that the following Best Management Practices were being incorporated in the liner design, construction quality assurance, and/or landfill operations:

a. The addition of a low vacuum gas extraction pipe within the anchor trench;
b. Welding of the primary and secondary linter in the anchor trench;
c. Ensuring that each pipe boot is properly welded around the entire riser pipe and spark tested; and
d. Implementing the Containment System Protection Protocols to prevent subsurface disturbances (drilling, excavation, trenching) from damaging the liner system.

231. The Discharger proposes to use a 6 inch layer of gravel in the LCRS and states that this will provide adequate drainage throughout the life of the unit. However, issues have arisen with units constructed this way at this facility and other sites that use the same design. Recently constructed units using this design are already showing significant decreases in returns during LCRS tests. DM-9.1 was constructed in 2018, and the 2019 LCRS test showed only an 80 percent return on injected water after just 1 year of operation. Over years of operation the accumulation of fines, scaling, and biofouling cause the LCRS system to function poorly or fail. Out of specification gravel, being poorly washed or graded, appears to have contributed to some of these failures despite being reviewed and approved by CQA officers during construction. Although the LCRS gravel did not pass the CQA standard when they are built, the CQA officer certified the report anyway. The detection of liquids and VOC impacted liquids in welded pan lysimeters underlying these units may be a result of these issues, causing the LCRS systems to back up creating head on the liner and increasing leakage rates of the containment system. These issues have been observed even before waste was placed in the newly constructed unit at another Recology site in a cell with the same design. Board staff also has concerns that 6 inches of gravel will not provide sufficient cover to protect the LCRS piping system. The Discharger is proposing to use 4 inch and 6 inch pipes, meaning that there would be between 0 and 1 inch of gravel cover to protect crushing. The LCRS system is inherently difficult to access and expensive to repair. Title 27 Section § 20340 parts (b)-(e) prescribe the performance standard for LCRS systems, and require in part that all LCRS be designed and operated to function without clogging through the scheduled closure of the Unit and during the post-closure maintenance period. Title 27 Section § 20340(c) states, in part, that the RWQCB shall specify design and operating conditions in WDRs to ensure that there is no buildup of hydraulic head on the liner. Recent designs for new waste management units at numerous active facilities that have been approved by the Board have included at least 12 inches of gravel in the LCRS in order to comply with this requirement. Therefore to be consistent with previous Board decisions, and taking into account the site specific compliance issues described above, these WDRs require that all new

units be designed and constructed with no less than 12 inches of gravel that meets the requirements of Construction Specification D.3. See also Construction Specification D.1.

232. The Discharger has proposed to construct future LF-3 and LF-4 modules, including DM-2.3, DM-10, DM-11.3, and the remainder of DM-8 and DM-9, consistent with previous WDR approvals for LF-4. These WDRs specify a containment system design for new LF-3 and LF-4 modules based on the proposed design, with the one modification being restoring the LCRS gravel thickness from 6 inches to12 inches as described in Finding above. See Construction Specifications D.1 through D.19.

233. The Discharger has proposed to include a foundation layer of at least 6 inches but up to 36 inches of soil between the primary liner and LDS Geocomposite layer. The Discharger states that the increase in foundation layer thickness is intended to establish the required separation between groundwater and the bottom of the primary liner, and that by using this design the secondary geomembrane also acts as a capillary break. However, a component of the containment system cannot also be used as a hydraulic barrier as buoyant forces may compromise the integrity of the liner. However, by placing the 6 to 36 inches of soil as part of the subgrade below the secondary liner instead of between the liners the threat of buoyant forces acting on the secondary liner is significantly reduced. Therefore, these WDRs require 6 inches of soil in the foundation layer, and any additional soil required to meet separation requirements to be placed in the subgrade layer.

234. The following is the base liner design that has been proposed by the Discharger with the changes to LCRS thickness described in Findings 231-233 above:

Table 16—Approved New Unit Containment System Design

Component	Option 1	Option 2
Operations Layer	≥ 12 Inches Soil[1]	
Filter Fabric	Geotextile[2]	
LCRS	12 Inches Gravel[3]	
Cushion Layer	Geotextile Cushion[4]	
Primary Liner	60-mil HDPE Geomembrane[5]	
	GCL and a Minimum 30-mil, Geomembrane Backing[6,7,8]	24-inch CCL[1]
	12-inch CCL[1]	
Foundation Layer	6 Inches Soil[1]	
LDS	Geocomposite[10]	
Secondary Liner	60-mil HDPE Geomembrane[5]	
	12-inch Compacted Clay[1]	--
Filter Fabric	Geotextile Cushion[2]	Geotextile[4]
Capillary Break[11]	6-inches Gravel[1,3] or Geocomposite	
Subgrade	Re-compacted Native Soil or Compacted Soil Fill[1,9]	

Notes:

1. Liner component soils and gravels prepared/compacted in accordance with project specifications.
2. Geotextile consists of non-woven fabric per project specifications.
3. Must comply with Construction Specification D.1. Discharger proposed 6 inches but increased to 12 inches based on Title 27 Section § 20340 requirements.
4. Cushion layer used only if the LCRS gravel is crushed, angular gravel, or greater than 0.5-inch in diameter. Cushion layer may not be required above the capillary break if a geocomposite or the secondary geomembrane is used as the capillary break. Cushion layer consists of non-woven fabric per project specifications.
5. Single or double-side textured (textured side down).
6. $K < 5x10^{9}$ cm/sec.
7. GCL shall exhibit appropriate strength characteristics (hydrated) to accommodate stresses associated with specific landfill design parameters, with particular attention to interface, long-term creep, shear, and bearing capacity.
8. 30-mil geomembrane backing placed below the GCL and maybe part of the GCL or provided separate from the GCL.

9. Subgrade layer thickness may be increased to 3 feet as a means to establish the required separation between the base of waste.
10. Geocomposite consists of geonet bonded to geotextile filter layer on both sides.
11. Capillary break is only required in the portions of the landfill where it necessary to provide 5 feet of separation between groundwater, including capillary rise and the bottom of the liner. Capillary breaks must be sloped to drain to a dedicated sump, which must be monitored in accordance with the requirements of the MRP. All capillary break sumps must include automatic pumps to ensure they remain pumped down and allow the capillary break to drain to maintain separation.

235. This design concept shown in Finding 234 complies with the requirements of Title 27. In compliance with Construction Specification D.12, the Discharger shall not commence liner construction (other than preparatory earthmoving and grading) until the Central Valley Water Board has approved in writing all necessary construction plans, specifications and construction quality assurance plans related to the new liner(s).

236. New WMUs will incorporate a leachate collection and removal systems (LCRS). The proposed LCRS must comply with Title 27 prescriptive standards (See Title 27, § 20340).

237. The unsaturated zone monitoring system for future modules shall be implemented in accordance with the operative MRP. Welded pan lysimeters are not considered adequate monitoring devices for the unsaturated zone as they are specifically constructed to be sealed and not be in direct contact with the unsaturated zone.

238. Future units bordering on LF-1 must be designed so that the liners lap up on the side slopes of LF-1. Design reports for units lapping up on the interim covered slopes of LF-1 must specify how the cover of LF-1 will be integrated into the design for the containment system of the new unit. A combined liner-cover system may be proposed provided that it incorporates (but does not necessarily duplicates) all required elements of each system, and provided that the combined containment system meets Title 27 performance standards for both final cover and Class III (non-composite) landfill liner.

Slope Stability

239. On 13 March 2015, in response to a requirement under 13301 Order R5-2014-0117, the Discharger submitted a technical report providing updated slope stability analysis of the landfill's temporary fill slopes (see 13 March 2015 Temporary Fill Slope Stability Technical Report, Recology Hay Road Landfill, prepared by Golder Associates, Inc.). The report included an updated seismic

hazard assessment, a review of the liner design and shear test parameters for each landfill module, identification of the temporary fill slopes associated with the modules consistent will the landfill's fill plan, and analysis of the stability of these slopes under both static and dynamic conditions, as required under previous WDRs and Title 27 regulations. The temporary fill slopes included the southern and eastern slopes of LF-1, which the Discharger plans to regrade to 4H:1V; the northern slope of LF-2; the northern and eastern slopes of LF-3; and the western (DM-4.3 and 7.1), southern (DM-7.2), and eastern (DM-4.1) slopes of LF-4. A total of eight critical cross-sections were evaluated along these slopes, including two at LF-1, one at LF-2, two at LF-3, and three at LF-4.

Table 17: Summary of Slope Stability Analyses for Static Conditions

Failure Mode	Representative Disposal Module	Static Factor of Safety	Yield Acceleration (g)	Seismically Induced Permanent Displacements (inches)
Permitted 4H:1V Slopes				
Foundation Stability	DM-1	3.6	0.56	0
Refuse Slope Stability	DM-2.2	1.7	0.164	<3
Refuse Slope Stability	DM-11	2	0.19	<3
Refuse Slope Stability	DM-8	1.94	0.17	<3
Cover Veneer	All DM's	2.8	0.38	<4
Alternative Slopes with 3.5H:1V for the Lowermost 50-Ft High Slope; 4H:1V for Remaining Slopes				
Foundation Stability	DM-1	3.5	0.558	0
Refuse Slope Stability	DM-2.2	1.7	0.162	<3
Refuse Slope Stability	DM-11	2	0.17	<3
Cover Veneer	All DM's	2.4	0.34	<5

240. Slope stability analysis was performed on the above cross sections using the SLIDE (Version 7.0) software program developed by Rocscience, Incorporated. The program performs two-dimensional limit equilibrium analysis using the method of slices to compute factors of safety based on various analysis procedures. Spencer's Method of Slices was used to compute the static safety

factors. Critical interface failure envelopes were developed for the modules based on the laboratory shear results from module CQA testing and other factors. Computed minimum static safety factors for the interim fill slopes included 3.1 at LF-1, 3.4 at LF-2, 1.6 at LF-3 (DM-2.2), and 1.8 at LF-4 (DM-7.1), indicating stable interim slopes under static conditions.

241. To evaluate the dynamic stability of the interim slopes, the yield acceleration was determined by applying a seismic coefficient until the factor of safety equaled 1.0. The yield accelerations were estimated to be 0.163g, 0.141g and 0.115g for cross sections A-A´, B-B' and C-C´, respectively. A seismic coefficient of 0.58 g was used in the analysis based on the design earthquake for the site. Once the yield acceleration was determined, the method of Bray et. Al (1998) was used to estimate the seismic displacements. Maximum calculated seismic displacements using this method were <1 at LF-1 and LF-2, 15.3 inches at LF-3 (DM- 2.2), and 5.1 inches at LF-4.

242. As summarized in Table 18, the calculated factors of safety exceed the minimum required factor of safety of 1.5 for static conditions. Permanent seismic displacements are approximately zero for DM-1, less than 1 inch for DM-2.1, and less than 6-inches for DM-3 through DM-7 and DM-11. As required by Title 27, Section 21750(f)(D), the engineer of record (Ken Haskell, California Licensed Professional Engineer #C53290) confirms that this amount of movement can be accommodated without jeopardizing the integrity of these units' foundation or the structures which control leachate, surface drainage, erosion, or gas. The displacement of 15.3 inches for cross section H-H' is discussed further in Finding 243.

Table 18: Summary of Slope Stability Analyses for Dynamic Conditions

Cross-Section	Disposal Module	Static Stability Factor of Safety	Dynamic Stability	
			Yield Acceleration (g)	Permanent Displacement (in.)
A-A'	DM-1	3.07	0.83	0
B-B'	DM-1	3.27	0.54	0
C-C'[1]	DM-4.3	2.24	0.2	1.5
D-D'	DM-7.1	2.1	0.21	2.3
E-E'	DM-7.1	1.79	0.16	5.1
F-F'[2]	DM-11.1	2.15	0.23	2.1
G-G'	DM-2.1	3.37	0.47	0.1
H-H'	DM-2.2	1.59	0.14	15.3

Notes:1. Section C-C' is a critical section representative of DM-3.3, DM-4.3, DM-6.1, and DM-6.2.
2. Section F-F' is a critical section representative of DM-11.1 and DM-11.2.

243. The 15.3-inch calculated displacement for LF-3 exceeded the 12-inch maximum allowable displacement recommended under EPA guidelines for dynamic slope stability. To address this issue, the report included a work plan to widen and/or increase the height of the existing soil buttress along the northern side of LF-3, DM-2.2 to increase its seismic stability. The work plan proposed installation of soil borings and geotechnical testing of the berm to determine its shear strength and other parameters. Once this information was obtained, additional dynamic slope stability analysis would be performed to determine the necessary dimensions for the berm. The Discharger has since completed the geotechnical investigation, as approved, and determined, based on revised geotechnical parameters, that northern side of LF-3, DM-2.2 is stable and that improvement of the buttress is not necessary.

244. The stability of the borrow pit slope was analyzed for both short-term condition (end-of-excavation) and long-term conditions (under steady-state seepage assuming continued dewatering activities and under groundwater rebound conditions). The slope stability analysis was performed using the SLIDE 7.0 computer program developed by Rocscience Inc. of Toronto, Canada. SLIDE 7.0 performs two-dimensional limit equilibrium analysis using the method of slices to compute factors of safety against slope instability. The analysis was performed using the Spencer method of slices, which satisfies both force and moment equilibrium. Under seismic conditions, the estimated maximum permanent displacement for cross section A-A' is between 5 and 16 inches and occurs for critical failure surface that is at least 225 feet from the base of the landfill. The estimated maximum permanent displacement for cross section B-B' is between 7 and 17 inches and occurs for critical failure surface that is more than 150 feet from Hay Road. The estimated maximum permanent displacement for cross section C-C' is between 10 and 15 inches. For these failure locations, the consultant Golder considered these displacements to be acceptable because they are less than their set design criterion of 24 inches.

245. Precipitation and drainage controls installed on the landfill units include:

    a. Top decks graded at 5 percent minimum for drainage.
    b. Soil berms along top deck perimeter to direct runoff to corner drop inlets.
    c. Overside drains to capture top deck and side slope bench drain flows.
    d. Ditches installed alongside slope benches to intercept and convey sheet flow runoff to overside drains. Benches also graded for sheet flow runoff.
    e. Landfill perimeter ditches to convey collected runoff to onsite storm water basins.
    f. Velocity controls (e.g., erosion control blanket, rip rap) at appropriate locations in bench drains and landfill perimeter ditches to reduce erosion. Construction reports historically submitted for the landfill units certified that the module designs (including precipitation and drainage controls) meet Title 27 requirements.

g. Waste Pile 9.1 side slopes: As with DM-11, WP-9.1 was graded with a 2 percent cross slope toward central LCRS header pipes (sloped at one percent) draining to two LCRS sumps located along the northern perimeter of the module.

Unit Closures

246. The Title 27 prescriptive standard for MSW landfill final cover includes the following components, from top to bottom:

a. Erosion Resistant Layer -- at least one foot of vegetative cover soil;

b. Low Hydraulic Conductivity (LHC) Layer -- not less than one foot of soil containing no waste or leachate, that is placed on top of the foundation layer and compacted to attain an hydraulic conductivity of either $1x10^{-6}$ 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. For compositely lined units this layer must be impermeable and of similar construction as the bottom liner system;

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

In lieu of the prescriptive cover design, the Discharger may construct an EAD provided that it meets the requisite demonstration under Title 27, section 20080(a) and is authorized under WDRs adopted by the Central Valley Water Board.

247. The Discharger plans to close LF-1 through 4 as a contiguous landfill. Design specifics are described in the Findings below. Upon reaching the final grades with inert fills, LF-1 will be closed with the Title 27 Prescriptive Standard. The final cover system will include a geomembrane over the lined portion of DM-1B per WDR requirements and up to the first bench of DM-1B. The LF-2 through LF-4 final cover as described in Findings 248-253 below is an engineered alternative design that provides equal or improved water quality protection than the prescriptive standard requirements of Title 27. Soil utilized for closure will come from the borrow pit and soil stockpile located on DM-2.1 and DM-2.2 totaling approximately 2.3 million cubic yards.

248. The nearest two DWR weather stations, Dixon 121 and Hastings Tract 122, are no longer in operation. Therefore, in order for the Discharger to collect accurate

site-specific atmospheric data to update their cover design as needed these WDRs require that a weather station be installed on site.

LF-2, LF-3, and LF-4 Cover Design

249. On 29 June 2015, the Discharger submitted a Preliminary Closure and Postclosure Maintenance Plan (PC/PCMP) for the landfill as part of the JTD. The PC/PCMP contained a conceptual plan for closure of the existing landfill disposal modules (i.e., DMs-1 through 11) as a single unit. The proposed closure activities would include grading and final cover installation; modifications and improvements to the landfill's monitoring systems and LFG control facilities; and various site improvements associated with landfill closure (e.g., drainage controls, demolition/decommissioning, survey monuments, site security). The PC/PCMP proposed an engineered alternative final cover design as follows:

Table 19: Proposed Engineered Alternative Final Cover Design

<table>
<tr><th>Component</th><th>Top Deck</th><th>Side Slope</th></tr>
<tr><td>Erosion Resistant Layer</td><td colspan="2">12 inches vegetative cover soil[1]</td></tr>
<tr><td rowspan="3">Low Hydraulic Conductivity (LHC) Layer</td><td>Geotextile Cushion[2]</td><td>Geocomposite[3]</td></tr>
<tr><td colspan="2">60-mil HDPE Geomembrane[4]</td></tr>
<tr><td colspan="2">GCL[5,6]</td></tr>
<tr><td>Foundation Layer</td><td colspan="2">24 inches (Minimum 12 inches clean soil overlaying minimum 12 inches of clean soil or waste soil material[7])[8]</td></tr>
</table>

Notes:
1. All cover soils/materials prepared/compacted in accordance with applicable project specifications.
2. Geotextile cushion layer consists of 10 oz/yd^2 non-woven fabric.
3. Geocomposite consists of geonet bonded to geotextile filter layer.
4. Geomembrane textured on both sides.
5. $K < 5x10^{-9}$ cm/sec
6. Although the Discharger proposed a GCL for the top deck only, Title 27 Section § 21090(a)(2) requires that a low conductivity layer be placed across the entire unit. A minimum of 1 foot of clean soil compacted to attain a hydraulic conductivity of either $1x10^{-6}$ cm/sec or a GCL with equivalent protection must be used on both the top deck and side slopes. See Construction Specification D.6.
7. Such as previously stockpiled C-soil or LC-soil.
8. The specification of 12 inches of clean soil in the top of the foundation layer was added by this WDR and was not originally proposed.

250. The PC/PCMP included a preliminary demonstration under Title 27 that construction of a prescriptive final cover on the landfill would be infeasible due a

significant shortage of cover soil at the site, which would need to be imported for project construction. Construction of a prescriptive clay component would therefore result in significantly higher project costs than the use of GCL. The demonstration also noted that the use of GCL eliminated the need to compact the cover and reduced the strain on the foundation layer. As a result, only one foot of foundation soil was needed for the proposed EAD. However, the Discharger did not provide evidence to support that a thinner foundation layer would provide equivalent protection of the cover's structural integrity from damage due to differential settlement of waste through the post closure period as required by Title 27 Section § 21090. Board staff has reviewed this proposal and finds that this does not provide equivalent protection of surface water and/or groundwater. Additionally, higher cost does not make construction of a cover that does not meet the performance requirements of Title 27 "infeasible". The Discharger's PCMP states that they have limited onsite soil reserves which would not allow close all existing and future units with a prescriptive cover. However, the Discharger is choosing to use available onsite soil to build additional units at the facility instead of closing the existing units with prescriptive covers and developing landfills at other facilities with more soil and proper siting criteria. The target date for closure for these units is 13 years away (see Finding 269 below), providing more than adequate time to bring in additional soil for prescriptive covers. For these reasons the proposed EAD is not approved by these WDRs. Instead, these WDRs require all LF units to be closed with prescriptive covers. See Construction Specification D.6.

251. The PC/PCMP also included a hydraulic performance equivalency demonstration using USEPA's Hydrologic Evaluation of Landfill Performance (HELP) model (v. 3.07). The analysis assumed the use of drought-resistant annual grasses (i.e., grasses that would not require irrigation) as vegetative cover; a geomembrane installation defect frequency of 2 holes per acre (considered in the range of good industry practice) and other assumptions. The results of the analysis indicated a hydraulic infiltration rate through the final cover on the top deck of 0.14 gallons per acre per day (gpad) for the proposed EAD compared to 0.35 gpad for the prescriptive standard design. Calculated infiltration rates for the final cover on the side slopes were the same for both designs (0.01 gpad).

252. The proposed final cover would be graded at 4H:1V and is supported by a static and dynamic slope stability analysis demonstrating that side slopes will remain stable, both under stable and dynamic conditions, throughout the life of the closed unit. (See Title 27, § 21750(f)(5).) The final cover will include a 15-foot wide bench at minimum for every 50 feet of vertical gain. (See Title 27, § 21090(a). Side slope benches (25 feet wide each) would be cut every 50 feet of vertical height per Title 27 requirements. The top deck of the unit would be graded at a 5 percent minimum slope to promote drainage and account for cover settlement, which could differentially reduce the drainage grade. The maximum elevation of the final cover would be 217.5 feet NAVD 88.

253. The PC/PCMP also included slope stability analysis of the proposed final cover, including the potential for a failure surface to develop within the cover, landfill refuse, and/or underlying liner or foundation/subsurface soil. The analysis assumed an MCE of 6.9 for all modules consistent with previous analysis and shear strengths measured for the modules constructed to date. The results of the stability analysis indicated minimum static safety factors greater than 1.5 for all three failure modes under static conditions and permanent displacements of less than 1, 3, and 4 inches, respectively, for the foundation, refuse, and final cover failure modes.

254. For LF-2 cover slopes overlapped by LF-3 sideslope liner as LF-3 is developed, these WDRs allow the Discharger to install a Class II containment system that functions as both LF-2 final cover and LF-3 side slope liner, provided that Title 27 performance standards are met. See Construction Specification D.2.

LF-1 Cover Design

255. On 15 October 2019, the Discharger submitted a *Final Closure Plan for LF-1, Partial Final Closure Plan and Postclosure Maintenance Plan* (LF-1 Partial Closure/PCMP), which is included in the JTD. This document is an update on sections of the 2015 PC/PCMP related to LF-1. The proposed final cover design is a Title 27 prescriptive cover consisting of the following (from bottom to top):

    a. A two-foot-thick foundation layer;

    b. A one-foot compacted clay soil ($k \leq 1.0 \times 10^{-6}$ cm/sec);

    c. A one-foot-thick vegetative soil layer.

    Although the plan, and the JTD and previous WDRs, indicate that the containment systems for LF-3 and LF-4 will lap up on the south and east slopes of LF-1 respectively, the LF-1 Partial Closure/PCMP does not specify how the LF-1 cover and LF-3 and LF-4 liner systems will be constructed. The details must be specified in future design reports, and comply with the requirements of Construction Specification D.2.

256. LF-1 includes DM-1B which was constructed with a geosynthetic liner containment system. As this is a compositely lined unit, Title 27 requires that this unit be closed with a cover that includes a geosynthetic layer as part of the low hydraulic conductivity layer as well (see Finding 246). Although this is acknowledged in the JTD, it is not described in the LF-1 Partial Closure/PCMP. Additionally, DM-1A has compliance issues described in the Corrective Action section including LFG, leachate in the unit, and separation of waste to groundwater. Therefore, this WDR requires that an Updated LF-1 Partial Closure/PCMP be submitted, and that at a minimum it include a geosynthetic layer over all of LF-1.

257. Construction of a Class II liner system over the side slopes of LF-1 will prevent LFG from migrating up and restrict access to LFG extraction. Therefore LFG extraction devices in those areas need to be installed prior to construction of lapped up units. This must be included in the Updated *Final Closure Plan for LF-1, Partial Final Closure Plan and Postclosure Maintenance Plan*. See Construction Specification D.6 and Time Schedule Item L.9.

258. WDR Order No. R5-2016-0056 required that LF-1 will be closed by October 2021. However, the Discharger did not receive the appropriate type of waste to fill the unit to reach its full capacity prior to that date. Given that the Discharger is continuing to address groundwater to waste separation issues these WDRs extend that closure date to 15 October 2024. Closure at that time will include final cover on external slopes and interim cover with preparation for lapped liners from LF-3 and LF-4 on internal slopes. See Construction Specification D.2.

259. The proposed final cover design in the 2019 LF-1 Partial Closure/PCMP specifies a minimum 3 percent top deck slope and side slopes with a horizontal to vertical relief of 3.5H:1V and 4H:1V, which will accommodate positive drainage and settlement. This is within Title 27 limits and supported by a static and dynamic slope stability analysis demonstrating that side slopes will remain stable, both under stable and dynamic conditions, throughout the life of the closed unit. (See Title 27, § 21750(f)(5).) The design does not specify if it will include a 15-foot-wide bench at minimum for every 50 feet of vertical gain as required by Title 27 section § 21090(a).

260. For LF-1 cover slopes overlapped by the future LF-3 sideslope liner, these WDRs allow the Discharger to install a Class II containment system that functions as both LF-1 final cover and LF-3 side slope liner, provided that Title 27 performance standards are met. See Construction specification D.2.

261. LF-1 is nearing final grades for closure and will be required to stop accepting waste in 2023. These WDRs requires the Discharger to submit an Updated *Final Closure Plan for LF-1, Partial Final Closure Plan and Postclosure Maintenance Plan* to update the closure schedule, specify benches in the design, and generally define how the cover and LFG management system of LF-1 will be integrate into the containment system of lapped up units including DM-2.3, DM-10, and DM-11.3. Closure of LF-1 is required to be completed by 15 October 2024. See Closure and Postclosure Maintenance Specifications G.2 & G.3. See Time Schedule Item L.9.

262. The next *Final Closure Plan and Postclosure Maintenance Plan* must generally define how the cover and LFG management system of LF-1 and LF-2 will be integrate into the containment system of lapped up units including DM-2.3 and DM-11.3. See Time Schedule Item L.3.

General Closure and Post Closure Maintenance

263. Closure activities will commence within 30 days of the receipt of the last load of refuse. In accordance with Title 27 section 20950(d), at least two permanent survey monuments will be installed by a licensed land surveyor or a registered civil engineer as part of the final closure.

264. Proposed landfill postclosure maintenance and monitoring activities included final cover maintenance; leachate management; maintenance and monitoring of LFG facilities; groundwater, vadose zone, and surface water monitoring; maintenance of precipitation and drainage controls; and other postclosure related activities.

265. 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.

266. The completed final cover will be periodically tested for damage or defects by monitoring surface emissions pursuant to California Code of Regulations, Title 17, section 95471(c) and Title 27, section 21090(a)(4)(A). Defects will be repaired and tested for adequacy based on the closure CQA Plan.

267. At final closure of LFs-1 through 4, all landfill units and drainage facilities, including overside drains, perimeter ditch, culverts, and sedimentation basin will be designed to handle a 1,000-year, 24-hour storm event consistent with the Class II designation of LFs-3 and 4. All compost drainage facilities, including the ponds, were designed to handle a 25-year, 24-hour peak storm event.

268. These WDRs require that a Partial FC/PCMP be submitted two years prior to a portion of a unit being sufficiently developed to a closable phase. See Closure and Post Closure Specification G.1.

Closure Schedule for Landfill Units

269. The 2019 *Final Closure Plan for LF-1, Partial Final Closure Plan and Postclosure Maintenance Plan* estimates that LF-1 will receive enough waste to bring the unit up to grade to be closed in 2023. Closure dates for other landfill units were not specified in that document. On 14 December 2021, the Discharger submitted an Updated Joint Technical Document, which indicates that the Facility's active WMUs (other than LF-1) are scheduled to be closed on the dates specified in in **Table 20**.

Table 20—Unit Closure Schedule

Unit Module	Estimated Closure Date
LF-1	2024
LF-2	2035
LF-3	2035
LF-4	2035
WP-9.1A	2025

Except for LF-1, closure dates are estimates, which may be affected by several factors (e.g., fluctuating waste receipts). These WDRs require that discharges to LF-1 cease no later than 31 December 2023 and that external side slopes be graded with interim cover no later than 1 October 2024. See Prohibition A.4 and Closure and Post Closure Specification G.3.

WP-9.1A, Borrow Pit, and Jepson Prairie Organics Composting Operation

270. In 2016/2017 the Discharger made the mandatory attempt to clean close the eastern portion of WP-9 (WP-9B) and the LTU. The clean closure was unsuccessful as groundwater impacts remain, and the Discharger choose to close the units as an LTU in accordance with Title 27 Sections 21410 and 21420. The remaining portion of WP-9.1 (WP-9A) which is currently operated as a Class II waste pile will eventually be clean closed prior to the full development of the remaining disposal modules (i.e. well before closure of the landfill). Therefore, WP-9.1A does not impact closure or postclosure maintenance of the site.

271. Similar to WP-9.1A, the JPO composting operation will be clean closed prior to the development of to the full development of the remaining disposal modules (i.e. well before closure of the landfill). Therefore, the composting facility does not impact closure or postclosure maintenance of the site.

272. Previous WDRs required that WP-9.1 be clean-closed at the end of its operating life prior to constructing disposal modules in that area. These WDRs carry over that requirement. See Construction Specification D.11.

Post-Closure Maintenance & Financial Assurances

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

274. 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 10 December 2021 Updated JTD provided a lump sum cost estimate for closure of the LF-1 and another lump sum cost estimate of LF-2, LF-3, and LF-4 (i.e., the largest future area needing closure at any one time absent phased closure) consistent with Title 27, section 21820(a)(1)(b). The total estimated cost of landfill closure for LF-1, including 20 percent contingency, was $3,341,513 in 2021 dollars. The total estimated cost of landfill closure for LF-1, including 20 percent contingency, was $29,600,956 in 2021 dollars. These WDRs require that the Discharger provide revised closure cost estimates in the appropriate closure plans required under this order for each landfill unit at the site. See Financial Assurance Specification I.2.

275. Title 27, sections 21840 and 22211 require a cost estimate for landfill post-closure maintenance. The 10 December 2021 Updated JTD included a cost estimate for the entire landfill postclosure maintenance/monitoring. The total estimated annual cost for post-closure maintenance/monitoring provided in the PC/PCMP was $410,182 in 2021 dollars. The corresponding 30-year cost was $12,305,468 in 2021 dollars. These WDRs require that the Discharger provide revised post-closure cost estimates in the appropriate closure plans required under this order for each landfill unit at the site. See Financial Assurance Specification I.2.

276. 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. The 10 December 2021 Updated JTD provided a lump sum cost estimate for closure of WP-9.1A consistent with Title 27, section 21820(a)(1)(b). The total estimated cost of landfill closure for WP-9.1A, including 20 percent contingency, was $565,980 in 2021 dollars. These WDRs require that the Discharger provide revised closure cost estimates in the appropriate closure plans required under this order for the waste pile. See Financial Assurance Specification I.2.

277. Title 27 requires that the Discharger provide and maintain financial assurances to CalRecycle in at least the amount of the closure and postclosure cost estimates, as annually adjusted for inflation. The Discharger has established a Trust Fund approved by CalRecycle for closure and postclosure financial assurances per Title 27, section 22240. The current balance of this Trust Fund was not reported in the Updated JTD. These WDRs require the Discharger to provide financial documentation showing that the Trust fund is appropriately funded

278. Title 27, section 22221 requires a cost estimate for corrective action of all known or reasonably foreseeable releases. On 17 May 2021, the Discharger submitted a cost estimate of $1,590,496 in 2021 dollars for corrective action of all known or

reasonably foreseeable releases at the landfill. (See 15 December 2020 report *Updated Corrective Action Estimate for a Release to Water, Recology Hay Road Landfill*, prepared by EBA Engineering). The cost estimate was based on the costs of investigating and remediating a hypothetical release of VOCs to groundwater from a disposal module on the eastern half of the site (i.e., LF-4) where there is no groundwater dewatering. The VOC plume was assumed to be 1,600 feet long, 600 feet wide, and 10 feet deep with an average total VOC concentration of 50 µg/L. The treatment system would include pump and treat system with liquid-phase granular activated carbon and an advanced oxidation or HiPOx reactor unit to treat alcohols and ethers (i.e., MTBE, tert- butyl alcohol) detected in landfill leachate. Treated groundwater would be discharged to a series of aboveground storage tanks (ASTs) for subsequent use for dust control, spray irrigation and/or composting operations. Total cleanup time is estimated to be 20 years. These WDRs approve this cost estimate.

279. The 10 December 2021 Updated JTD includes costs estimates for closure (Title 27, §§ 21820, 22206), post-closure maintenance (§§ 22210–22212), and foreseeable corrective action for releases (§§ 22220–22222) for the landfill units and WP-9.1A. As of the date of this Order, these estimates, calculated in accordance with Title 27, are specified in **Table** .

Table 21—Current Cost Estimates (Financial Assurances) in 2021 Dollars

Requirement	Estimated Cost
Closure of LF-1	$3,341,513
Closure of LFs 2-4	$29,600,956
Closure of WP-9.1A	$565,980
Post-Closure Maintenance	$12,305,468
Corrective Action	$1,590,496

280. This Order requires the Discharger to maintain financial assurances with CalRecycle in at least the Estimated Cost amounts specified in **Table** , in accordance with Title 27. See Financial Assurance Specification I.1.

281. The Discharger has established an enterprise fund for closure, postclosure maintenance and corrective action. The fund has been approved by CalRecycle for corrective action financial assurances per Title 27, Chapter 6, Subchapter 2. See Financial Assurance Specification I.1.

282. CalRecycle issued a Financial Assurance Mechanism Review on 4 February 2022 stating that the financial assurance demonstration determined that the enterprise fund established by the Discharger for closure, postclosure maintenance and corrective action meet all the requirements and, based on the

cost estimates and the capacity information submitted by the operator, is adequately funded.

283. As of the date of this Order, the closure fund, post-closure maintenance fund and corrective action fund balances are specified in **Table** .

Table 22—Current Fund Balances (Financial Assurances)

Requirement	Current Balance
Closure and Post-Closure Maintenance	$16,406,534
Corrective Action	$1,199,036

California Environmental Quality Act

284. In accordance with the California Environmental Quality Act (CEQA), Public Resources Code section 21000 et seq., on 11 June 2020, Solano County certified an Environmental Impact Report (EIR), titled *Draft Subsequent Environmental Impact Report for the Recology Hay Road Landfill Land Use Permit Amendment No. 2 SCH No. 2018 032 031*, in connection with its issuance of a Revised Solid Waste Facilities Permit. For purposes of the EIR, the "project" includes the following pertinent elements:

a. Expansion of the landfill disposal area to include an additional 24-acre area located within the project site;

b. Modification of groundwater and landfill gas monitoring network, as well as its leachate collection system, to include the additional disposal area;

c. Deepening of the Borrow Pit; and

d. Addition of a construction and demolition sorting line, temporary on-site storage of baled single stream recyclables, disposal of friable asbestos within additional areas of landfill, and an enclosed gas flare.

285. This Order implements all applicable mitigation and monitoring measures specified in the EIR.

Other Regulatory Matters

286. This Order is issued in part pursuant to Water Code section 13263(a), which provides as follows:

> The regional board, after any necessary hearing, shall prescribe requirements as to the nature of any proposed discharge, existing discharge, or material change in an existing discharge…, with

> relation to the conditions existing in the disposal area … into which, the discharge is made or proposed. The requirements shall implement any relevant water quality control plans that have been adopted, and shall take into consideration the beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges, the need to prevent nuisance, and the provisions of [Water Code] Section 13241.

287. This Order implements:

a. Central Valley Water Board's Basin Plan, which designates beneficial uses for surface water and groundwater and establishes water quality objectives (WQOs) necessary to preserve such beneficial uses.[2] (Wat. Code, § 13241 et seq.);

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.

288. 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.

289. 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

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[2] Designated beneficial uses surface water and groundwater are discussed in Finding 26 and Finding 38, respectively.

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.

290. Anti-Degradation Policy does not apply to the discharge of waste to Recology Hay Road Landfill. The requirements of this Order are designed to ensure that any such wastes are fully 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.

291. Consistent with Title 27, this Order requires the Discharger to maintain the Facility to contain waste within WMUs, thereby preventing degradation of water quality. To the extent that there are releases from Facility WMUs, will be required to address such releases through a Corrective Action Program. (See Title 27, §§ 20385, 20415, 20430.) Because this Order does not authorize any degradation in water quality, it complies with the *Antidegradation Policy*.

292. For the purposes of California Code of Regulations, title 23 (Title 23), section 2200, the Facility has a threat-complexity rating of **1-A**, where:

a. Threat Category "1" reflects waste discharges that can cause long-term loss of receiving water beneficial uses (e.g., drinking water supply loss, water-contact recreation area closures, or posting of areas used for spawning/growth of shellfish or migratory fish); and

b. Complexity Category "A" reflects any discharge of 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.

The WDR review cycle for 1A discharges is 5 years from the date of adoption of the WDRs, or, if granted a continuance by the Executive Officer, from the continuance date. The WDR fee schedule may be found on the State Water Resource Control Board website. (http://www.waterboards.ca.gov/)

293. Water Code Section 13267(b) provides that: "In conducting an investigation specified in subdivision (a), the Central Valley Water Board may require that any person who has discharged, discharges, or is suspected of discharging, or who proposed to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who had discharged, discharges, or is suspected of discharging, or who proposed to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Central Valley Water Board requires. The burden, including costs of these reports, shall

bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports."

294. The technical reports required by this Order and the attached "Monitoring and Reporting Program R5-2022-0047" 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.

Reporting Requirements

295. This Order is also issued in part pursuant to Water Code section 13267(b)(1), which provides that:

> [T]he regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region … shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

296. The technical reports required under this Order, as well as those required under the separately issued MRP, are necessary to ensure compliance with prescribed WDRs and the provisions of Title 27, Subtitle D (40 C.F.R. part 258) and State Water Board Resolution 93-62. Additionally, the burdens associated with such reports are reasonable relative to the need for their submission.

297. Failure to comply with the reporting requirements under this Order and the MRP may result in enforcement action pursuant to Water Code section 13268.

Procedural Matters

298. All local agencies with regulatory jurisdiction over land-use, solid waste disposal, air pollution and public health protection have approved the use of the Facility's site for the discharge of waste to land as provided for herein.

299. The Discharger, interested agencies and interested persons were notified of the Central Valley Water Board's intent to prescribe the WDRs in this Order, and provided an opportunity to submit their written views and recommendations at a public hearing. (Wat. Code, § 13167.5; Title 27, § 21730.)

300. At a public meeting, the Central Valley Water Board heard and considered all comments pertaining to the discharges regulated under this Order. Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of the Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the State Water Resource Control Board website (http://www.waterboards.ca.gov/). or will be provided upon request.

REQUIREMENTS

IT IS HEREBY ORDERED, pursuant to Water Code sections 13263 and 13267, that that Waste Discharge Requirements Order R5-2016-0056 is rescinded, except for purposes of enforcement, and Recology and their agents, employees, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted there under, shall comply with the following:

A. Discharge Prohibitions— The Discharger shall comply with all Standard Prohibitions (SPRRs, § C), which are incorporated herein, as well as the following:

1. "**Hazardous Waste**," as defined as defined under Title 27, section 20164, shall not be discharged at the Facility except where specified below. The Central Valley Water Board and the Department of Toxic Substances Control (DTSC) shall be immediately notified of any such discharges in violation of this Order.

    a. Hazardous asbestos-containing wastes (ACW) may be discharged to LF-1 (DM- 1A and DM-1B) to bring that portion of the unit up to final grade for closure and to any LF-3 or LF-4 module.

    b. Wastes authorized under Title 22 to be managed as nonhazardous at a Class II landfill, and/or wastes granted a variance or reclassified under Title 22 regulations may be discharged to, or beneficially reused in, LF-3 and/or LF-4 (e.g., C-Soil, treated wood waste). The discharge or reuse of such wastes at Class III units (i.e., LF-1 and LF-2) is prohibited except that the existing stockpile of LC-soil at module DM-2.1 may remain in place until used as foundation cover at DM 2.1 or removed and reused at LF-3 or LF-4.

    c. Wastes that have been treated or transformed in accordance with applicable regulations so as to be no longer hazardous. (e.g., medical wastes) may be discharged to LF-3 and/or LF-4.

2. The discharge of “designated waste”, as defined under Title 27, section 20164, to any Class III landfill units (LF-1 and LF-2) at the site is prohibited, with the exception of stockpiles of LC-Soil previously approved by the Central Valley Water Board for use as foundation soil on LF-2. No additional designated waste may be discharged to LF-2.

3. Except as specifically authorized in **Section 0** and **Table 23**, “Designated Waste,” as defined per Water Code section 13173, shall not be discharged at the Facility.

4. The discharge of new or additional waste to LF-1 is prohibited, except for the following:

    a. The discharge of hazardous ACW to LF-1 noted in Prohibition A.1.a.

    b. The discharge of inert wastes (see Title 27, section 20230), nonhazardous C&D, or relocation of existing wastes within LF-1, as necessary, to establish final grades for closure consistent with an approved FC/PCMPs for those units submitted under this Order.

    c. The stockpiling or beneficial reuse of inert materials in final cover construction or repair (e.g., foundation layer, side slope buttresses, berms) consistent with Discharge Specification B.4;

    d. The use of compost or dried sewage sludge as a soil amendment in final cover to promote vegetative growth. If the Discharger intends to do this they must describe how this will be done using agronomic rates in the Final Cover Workplan and also submit a stormwater monitoring workplan to ensure surface water is not impacted.

    All discharges to LF-1 above shall be terminated by **31 December 2023**. See Closure and Postclosure Specifications G.2. Closure activities begin must begin within 90 days of ceasing acceptance of waste.

5. The stockpiling of wastes or materials on landfill modules is prohibited, with the following exceptions

    a. Inert wastes discharged to units for closure or postclosure maintenance purposes, as identified in Prohibition A.3 above;

    b. The maintenance of temporary soil, C-Soil, or soil-waste admix operations stockpiles on Class II modules for landfill closure or construction purposes (e.g., operations layer, foundation layer for final cover, perimeter berms);

    c. The stockpiling of approved materials on Class II units for interim cover/ADC operations (e.g., see Discharge Specification B.9);

d. Seasonal stockpiles of de-watered sludge (biosolids) on Class II modules for drying (e.g., dry season) or storage (e.g., wet season) purposes.

e. LC-soil re-classified as “nonhazardous” by the Department of Toxic Substances Control and as approved by Central Valley Water Board in 1993 and 1994 may be stockpiled on LF-2 and LF-3; and/or

f. LF-3 stockpiles may be placed on top of the LF-3 interface liner where the location is vertically above LF-1 or LF-2.

All operations stockpiles on landfill modules shall be conducted consistent with the approved plan(s) applicable to those operations.

6. The discharge of anthropogenic compounds to groundwater or surface water is prohibited, including but not limited to VOCs, SVOCs, chlorophenoxy herbicides, and Organophosphorus compounds.

7. Except as expressly authorized in the Discharge Specifications and Table 23, leachate and landfill gas (LFG) condensate shall not be discharged into Facility WMUs.

8. Leachate and landfill gas (LFG) condensate shall not leave containment structures, nor be discharged to soil, surface water, or groundwater.

9. The discharge of liquid waste, other than LFG condensate and leachate in the manner described in this Order, is prohibited.

10. The following discharges of leachate and/or LFG condensate are prohibited:

    a. The return of leachate and/or LFG condensate to an MSW landfill unit that does not have a composite liner system and LCRS (i.e., LF-1).

    b. The discharge of leachate and/or LFG condensate from one MSW landfill unit to another, including from LF-1 to LFs-2, 3 or 4; from LF-2 to LFs-1, 3 or 4; from LF-3 to LFs-1, 2 or 4; and/or from LF-4 to LFs-1, 2 or 3. See Discharge Specification B.5.

    c. The return or discharge of leachate and/or LFG condensate to closed units or closed portions of active units.

    d. The return of leachate and/or LFG condensate to LF-2.

    See 40 CFR 258.28(a)(2) and Title 27, sections 20705(f), 20090(e)(2), 20200(d), 20340(g), and 20190(a)(5).

11. All LCRS sumps must be operated such that the respective LCRS layer is free draining. Any liquid must be removed immediately following detection measurable liquid level to maintain the maximum design capacity of the sump and prevent head buildup on the liner. Leak detection sumps and pan lysimeters (welded or not welded) shall be free of all liquid. Any liquid must be removed immediately following detection measurable liquid level, Board staff must be immediately, and the liquid sampled as required by the MRP.

12. Treated Wood Waste (TWW) may only be discharged to LF-3 and LF-4, and shall not be discharged to landfill modules that have a confirmed leachate leak that contains TWW constituents. Upon confirmation of a leachate leak or release from the landfill to the unsaturated zone and/or groundwater, or fluid in an unsaturated zone or a leak detection device containing one or more TWW constituents, all TWW discharges to that module shall be ceased until such time as corrective action measures result in cessation of the leak/release. Handling, storage, and disposal of TWW shall comply with the requirements of Health and Safety Code Article 11.2, commencing with Section 25230.

13. The Discharger shall comply with all items in the Standard Monitoring Specifications (SPRRs).

14. A Class II waste pile shall not be used for disposal of wastes.

15. No waste with greater than 50 percent liquid may be discharged to any landfill unit.

16. The cessation of any corrective action measure (e.g. landfill gas extraction, groundwater extraction) is prohibited without approval from Board staff. If routine maintenance or breakdown results in cessation of corrective action for greater than 24 hours, the Discharger shall immediately notify Board staff.

B. Discharge Specifications—The Discharger shall comply with all Standard Discharge Specifications (SPRRs, § D), which are incorporated herein, as well as the following:

1. The Discharger shall only discharge waste to Facility WMUs as specified in **Table 23**, subject to the table-specific definitions provided below.

Table 23—Authorized Waste Discharges at Facility

Waste Category	LF-1	LF-2	LF-3 and 4	WP-9.1A
Hazardous Waste Wastes which, pursuant to Title 22, section 66261.3 et seq., must be managed in accordance with Division 4.5 of Title 22. (Title 27, § 20164; Title 23, § 2521(a).)	No	No	No	No
Municipal Solid Waste (MSW) Wastes subject to 40 C.F.R. part 258. (Title 27, § 20164.)	No	Yes	Yes	No
Designated Waste[1] (1) Hazardous Wastes subject to a variance from management requirements per Health and Safety Code section 25143; (Wat. Code, § 13173.)	No	No[2]	Yes	No
Nonhazardous Designated Waste[3] (2) Nonhazardous Waste containing constituents that, under ambient conditions, could be released in concentrations exceeding WQOs, or could reasonably be expected to affect beneficial uses. (Wat. Code, § 13173.)	Yes	Yes	Yes	No
Inert Wastes C&D Wastes Wastes that contain neither (i) hazardous wastes or soluble pollutants at concentrations in excess of WQOs, nor (ii) significant quantities of decomposable material. (Title 27, §§ 20164, 20230(a).)	Yes	Yes	Yes	No
Landfill Gas Condensate Liquid removed from a gas control system at a landfill and which are produced by the condensation of landfill gas being conveyed by that system. (Title 27, § 20164.)	No	No	Yes[4]	No
Leachate (spray application only) Liquid formed by the drainage of liquids from waste or by the percolation or flow of liquid through waste. Includes any constituents extracted from the waste and dissolved or suspended in the fluid. (Title 27, § 20164.)	No	No	Yes[4]	No
Asbestos-Containing Waste (>1 percent) Wastes containing at least 1 percent of non-friable asbestos particles.	Yes	No	Yes	No
Treated Wood Waste Wood treated with chemical preservatives that are: (i) administered for protection against insects, microorganisms, fungi, and other conditions leading to decay; and (ii) registered under the Federal Insecticide, Fungicide and Rodenticide Act. (Title 22, § 67386.4.)	No	No	Yes	No
Dewatered Wastewater Treatment Plant Sludge	No	No	No[5]	Yes

Waste Category	LF-1	LF-2	LF-3 and 4	WP-9.1A
Special Wastes Special wastes as defined by Title 27 (e.g., triple-rinse pesticide containers, tires, large dead animals, medical wastes. Incinerator ash, and agricultural wastes).	No	No	Yes	No

Notes:

1. Includes C&D, commercial, industrial, contaminated soils, semi solids, industrial sludges, and dredge spoils.
2. Lead-contaminated soil re-classified as “non-hazardous” by the Department of Toxic Substance Control and as approved by the Central Valley Regional Water Quality Control Board in 1993 and 1994 has been stockpiled on LF-2 and may be used as part of the foundation of the cover at closure. No additional C-soil is permitted to be accepted.
3. Includes C&D, commercial, and industrial wastes.
4. Leachate and landfill gas condensate recirculation may occur in compositely lined modules. Leachate may only be recirculated back to the module from which it was collected.
5. Prohibited except for use as daily cover if the material meets the requirements of Title 27 Section § 20690 and is applied in compliance with the requirements of that section.

2. If waste is discharged at the Facility in violation of this Order the Discharger shall immediately notify the Board and LEA via email and promptly remove and relocate all. The Discharger shall submit a report within 30-days to the Central Valley Water Board including the following items:

   a. An explanation of how the violative discharge(s) occurred;
   b. A detailed cost estimate to remove the waste, properly dispose it, and make necessary repairs to the unit; and
   c. Proposes waste acceptance program updates to prevent reoccurrences.

3. Class II landfill modules (i.e., LF-3 and LF-4) may accept C-Soil for disposal, as alternative daily cover (ADC), and as foundation layer for final cover.

4. All C-Soil stockpiles must be managed and monitored as designated waste. Stockpiles must have intermediate cover, stormwater controls, and slopes not to exceed three to one (3:1).

5. Leachate and landfill gas condensate recirculation may only occur in compositely lined modules. Leachate may only be recirculated back to the area covered by the landfill unit from which it was collected.

6. The discharge of “designated waste”, as defined under Title 27, section 20164, shall be limited to Class II landfill units (i.e., LF-3 and LF-4).

7. The discharge of Title 22 special wastes, including, but not limited to C-Soil, shall be limited to Class II landfill units (i.e., LF-3 and LF-4).

8. The discharge of Title 22 hazardous wastes granted a variance; reclassified; or otherwise authorized to be disposed of at a Title 27-regulated landfill (e.g., C-Soil, TWW) shall be limited to Class II landfill units equipped with a composite liner system and LCRS (i.e., LF-3 and LF-4) including on top of the LF-3 interface liner where the disposal location is vertically above LF-1 or LF-2. An exception is made for the LC-soil currently stockpiled on LF-2; that stockpile may remain but no additional LC-soil may be added.

9. The discharge of liquids to the landfill shall be limited to the following:

    a. Landfill leachate and/or LFG condensate returned to, or used for dust control on the active face of, the active MSW landfill unit from it was generated, provided such MSW landfill unit was constructed with a composite liner system and LCRS.

    b. The beneficial reuse of inert liquids for construction or maintenance purposes (e.g., dust control).

    c. Small containers of household liquids consistent with 40 CFR part 258.28.

    d. The beneficial reuse of compost Pond B liquid for dust control on Class II landfill units constructed with a composite liner system and LCRS. Leachate and LFG condensate derived from LF-1 and LF-2 shall therefore be discharged at an authorized offsite facility or appropriately handled for such discharge (e.g., stored in tanks pending pick-up) in accordance with the Landfill Liquids Management Plan.

10. The co-disposal of semi-solid wastes with solid wastes shall be limited to dewatered WWTP sludge and/or water treatment plant sludge (i.e., sludge from which all free liquids have been removed) discharged to LF-3 and/or LF-4.

11. The beneficial reuse of wastes in final cover construction, repair or maintenance at unlined or partially-lined MSW landfill units (i.e., LF-1 and LF-2) per Prohibition A.4.c and A.4.d shall be subject to the following restrictions:

    a. Inert wastes used in construction or repair of landfill final cover shall meet the project specifications contained in the approved construction documents described in, or submitted under, this Order and shall be applied consistent with the approved FC/PCMP for that unit submitted under this Order. See Construction Specifications.

b. Only clean soil (i.e., soil not containing any waste) may be used in the construction/repair of any containment system, for example the landfill cover; the erosion resistant and low hydraulic conductivity layers of prescriptive cover; cover berms and drains; side slope benches; landfill buttresses, and detention basin walls.

c. Inert liquids (i.e., unimpacted groundwater, surface water, or storm water) may be applied to landfill cover for construction or maintenance purposes (e.g., dust control, limited irrigation of vegetative cover) consistent with Title 27, section 21090(a)(5)(B). If the discharger intends to use capillary break water or water from the borrow pit they must first submit analytical data and receive approval from Board staff.

d. LC-soil re-classified as "nonhazardous" by the Department of Toxic Substances Control and as approved by Central Valley Water Board in 1994 may be used as foundation cover soil on LF-2.

12. Consistent with Prohibition A.10, LFG extracted from an MSW landfill unit (e.g., LF-3) shall not, prior to removing LFG condensate, be comingled with LFG extracted from another MSW landfill unit (e.g., LF-4), if such condensate is to be returned to the former MSW landfill unit (e.g., LF-3).

13. Consistent with Prohibition A.5, daily cover and ADC stockpile operations shall be limited to active MSW landfill units LFs-3 and 4, with the exception of the existing LC-soil stockpile on LF-2 consisting of LC-soil reclassified as "nonhazardous" by the Department of Toxic Substances Control and as approved by Central Valley Water Board in 1994. The use of ADC at these units shall be limited to the wastes/materials that have either been designated acceptable in Title 27 or wastes/material for which the Discharger has prepared a site-specific demonstration project and obtained approval consistent with Title 27, Section 20690. The following wastes/materials are currently approved for use as ADC on all LF units based on information in the JTD and demonstrations under previous WDRs:

a. Green waste material, compost-overs, ground wood, and/or C&D fines;
b. Shredded tires;
c. Moisture-conditioned ash, cement kiln dust, and/or mixtures of these wastes; and/or,
d. Geosynthetic fabric, blankets, and/or foam products.

Class II compositely lined LF units may also use the following as ADC:

a. Dried sewage sludge/biosolids;
b. C-Soil
c. Non-hazardous dredge spoils, foundry sands, and/or contaminated sediment;

The Discharger shall not use any new waste/material (i.e., item not included in the above list) as ADC, or any material other than clean soil as intermediate cover (except for biosolids as a cover soil amendment per Prohibition A.5), unless it has been designated acceptable in Title 27 or the Discharger has prepared a site specific demonstration project demonstrating that the proposed alternative material meets the requirements in Title 27, Section § 20690 and the demonstration has been approved by the Local Enforcement Agency and Water Board staff.

14. The Discharger shall use approved ADC only in internal areas of the landfill that do not drain outside of the limits of the contiguous landfill units, unless the Discharger demonstrates that runoff from the particular ADC is not a threat to surface water quality and the demonstration has been approved in writing.

15. Discharger shall submit an engineering feasibility study (EFS) to evaluate remedial action alternatives for DM-8.1 and DM-9.1 if concentrations of nitrate are detected above the concentration limit of 5 mg/L at one or more of the downgradient POC wells on the east and southern perimeter of LF-4. The Discharger shall also begin sampling G-25, G-28, G-29, and G-30 quarterly for Groundwater Constituents presented in Tables 2 and 3 of the MRP.

16. Storm water contacting non-inert wastes, including any stockpiled wastes on landfill modules or wastes used in interim cover/ADC operations, shall be handled and disposed of as leachate.

17. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order. The Discharger shall submit a report to the Central Valley Water Board explaining how the discharge occurred, and any updates to the waste acceptance program necessary to prevent re-occurrence. If the waste is a hazardous waste, the Discharger shall also immediately notify the Department of Toxic Substances Control.

18. The Discharger shall discharge treated wood wastes only to landfill modules equipped with a composite liner system and a leachate collection and removal system (i.e., Landfill Units LF-3 and LF-4 modules). If a verified release is detected from the waste management unit module where treated wood is disposed and the release has been confirmed to contain one or more TWW waste constituents, the disposal of treated wood shall be terminated at the module with the verified release until corrective action ceases the release.

19. The Discharger shall manage treated wood waste in accordance with the requirements of Health and Safety Code Article 11.2, commencing with Section 25230, and shall comply with all prohibitions listed in Title 22, section 67386.3.

20. Consistent with the design options specified in Construction Specification D.1, all future landfill expansion units/modules shall be sited, designed, and constructed

to ensure at least 5 feet of separation between the lowest elevation of wastes (i.e., leachate in primary LCRS sump) and the highest anticipated elevation of underlying groundwater in the absence of groundwater pumping. The highest anticipated elevation of underlying groundwater, in accordance with Title 27 Section § 20164, shall be calculated by adding the capillary rise (unless a sufficient capillary break is included in the design) to the highest measured groundwater elevation reported in all available historical data for that local area.

21. The Discharger shall comply with all Standard Discharge Specifications listed in Section D, and all Standard Storm Water Provisions listed in Section L, of the Landfill SPRRs.

22. The discharge of wastes to a Class II waste pile shall be limited to designated, nonhazardous, and/or inert solid and/or semi-solid wastes.

23. Sewage sludge discharges to a Class II waste pile shall contain at least 20 percent solids (by weight) if primary sludge, or at least 15 percent solids if secondary sludge, or a mixture of primary and secondary sludges.

24. A minimum freeboard of 3 feet shall be maintained at a Class II waste pile between the highest elevation of wastes (including any ponded storm water) and the lowest elevation of the surrounding containment berm.

25. Storm water ponded on top of a Class II waste pile shall be removed within 24 hours and disposed of as leachate.

26. The Discharger shall comply with all Standard Discharge Specifications listed in Section D, and all Standard Storm Water Provisions listed in Section L, of the Industrial SPRRs.

C. Facility Specifications—The Discharger shall comply with all Standard Facility Specifications (SPRRs, § E) which are incorporated herein.

1. All existing and future classified units shall comply with the separation requirements described below. Separation shall be the vertical distance between the lowest elevation of wastes (i.e., lowest point of the primary LCRS sump) and the highest anticipated elevation of underlying groundwater, including capillary fringe (unless a sufficient capillary break is engineered into the liner system). The compliance elevation shall be a horizontal plane underlying the entire unit. The evaluation of compliance with separation requirements for each unit shall be performed by comparing the groundwater elevation in the appropriate monitoring device(s) to the compliance elevation established in Attachment B.

    a. Existing classified units DM-1A, DM-1B, DM-8.1, and DM-9.1 shall be operated to ensure compliance with Title 27 Section § 20240(c) prescriptive standard of 5 feet of separation between waste and

groundwater. See Table 24 below and Attachment B for required separations.

b. DM-2.1A&B, DM-3.1, 3.2, 3.3, DM-4.1, DM-5.1&5.2, DM-6, DM-7.1&7.2, DM-11.1&11.2, and WP-9.1A shall be operated consistent with the engineered alternative designs for groundwater separation (EAD/S), approved for these units/modules under previous WDRs. See Table 24 below for required separations.

c. All future classified units constructed at the site shall be sited, designed, and constructed to ensure compliance with Title 27 Section § 20240(c) prescriptive standard of 5 feet of separation between waste and the highest anticipated elevation of underlying groundwater. Title 27 Section § 20164 states that highest anticipated elevation of underlying groundwater shall be calculated by adding the capillary rise (unless a sufficient capillary break is included in the design) to the highest measured groundwater elevation reported in all available historical data for that local area. See Table 24 below for required separations.

Table 24: Required Separation from Highest Anticipated Elevation of Underlying Groundwater for All Current and Future Units

Unit		Required Separation (ft)
LF-1	DM-1A	5
	DM-1B	5
LF-2	DM-2.1A	3
	DM-2.1B	3
LF-3	DM-2.2A	2.5
	DM-2.2B	2.5
	DM-11.1	2.5
	DM-11.2	2.5
	All Future DMs	5
LF-4	DM-3.1, 3.2, 3.3	2.5
	DM-4.1	2.5
	DM-5.1, 5.2	2.5
	DM-6	2.5
	DM-7.1, 7.2	2.5
	DM-8.1	5
	DM-9.1	5
	All Future DMs	5
N/A	WP-9.1A	2.5

For the purposes of this specification, the following shall apply:

a. The lowest elevation of wastes in lined units shall be the lowest elevation of leachate in the unit's primary LCRS sump and in unlined units shall be the lowest elevation of wastes.

b. The highest anticipated elevation of underlying groundwater shall be the seasonally highest level that is expected to occur in the presence or absence of groundwater pumping, as applicable, including capillary fringe unless a sufficient capillary break is engineered into the liner system;

c. The groundwater elevation beneath each module shall be monitored using dedicated piezometers installed outside the liner system and adjacent to the primary LCRS sump at a location that allows for measurement of the groundwater table. These WDRs include a schedule for submission of a

work plan and installation of these devices, see Time Schedule Item L.12; and

d. The maximum groundwater elevation beneath each module of each classified unit at the site, including capillary fringe unless a capillary break is engineered into the liner system, shall not be allowed to exceed the value listed for that module in Attachment B attached to this Order, corresponding to the location of the lowest elevation of waste in the module under normal operations.

2. Per Title 27, section 21760(b), the Discharger shall develop and implement the following operations and maintenance (O&M) plans:

   a. A Landfill Gas Controls Evaluation and O&M Plan Update for the LFG extraction system to ensure that LFG is being sufficiently controlled at each landfill unit to prevent LFG migration from the unit that could impact or threaten water quality, and that extracted LFG is being handled appropriately in accordance with the requirements of this Order and Title 27 regulations. The plan shall include, but not be limited to, a plan for the installation of additional LFG extraction wells and/or capacity, as necessary, if LFG is not currently adequately controlled and the separate handling of LFG collected from a unit to which condensate from that LFG is being returned per Discharge Specification B.5. See Time Schedule Item L.15.

   b. An LCRS Sump O&M Plan Update to ensure that LCRS sumps are properly operated and that appropriate short term and long term response measures are timely implemented in response to foreseeable events such as a sump leak, the detection of fluid other than leachate in a sump, and/or a release from the unit under Title 27. The LCRS Sump O&M Plan shall include a description of the operation and maintenance procedures for all LCRS sumps at the site including landfill and waste pile modules. For each type of sump (e.g., primary, secondary/leak detection, welded pan lysimeter) at each unit, the plan shall describe the sump's design, purpose, operating parameters; monitoring facilities; action leak rate; short term and long term response plans in the event of a sump leak; notification of a release procedure; and the handling and disposition of any collected liquid (e.g., tanks, returned to landfill or primary LCRS). The plan must also include a description of how capillary break layers will be operated and maintained in units constructed with them. This must include procedures to monitor for functionality and pumping out and disposal of liquid. See Time Schedule Item L.17.

3. By **30 September of each year**, the Discharger shall submit an Annual Winterization Plan describing measures planned to prepare the site for

operations during the wet season consistent with the requirements of this Order. All classified units at the site (i.e., landfills, waste pile, LTU), including associated operations stockpiles, and the onsite composting facility (including ponds) shall be winterized in accordance with the Annual Winterization Plan. All repairs and winterization measures implemented under the approved plan shall be completed by 31 October of each year.

4. In the event of an interruption of greater than 24 hours of any corrective action measures, the Discharger shall notify the Board staff via e-mail, fax, or telephone within 24 hours of discovery of the interruption and shall provide weekly status updates until the corrective action measure are back on-line.

5. The Discharger shall comply with all Standard Facility Specifications listed in Section E, and all General Provisions listed in Section K, of both the Landfill SPRRs and Industrial SPRRs.

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

1. Base liners and slope liners for **all new WMUs** shall be constructed according to the specifications in Table 25 below:

Table 25: Class II Base Liner Design Requirements

<table>
<tr><td>Component</td><td>Option 1</td><td>Option 2</td></tr>
<tr><td>Operations Layer</td><td colspan="2">≥ 12 Inches Soil[1]</td></tr>
<tr><td>Filter Fabric</td><td colspan="2">Geotextile[2]</td></tr>
<tr><td>LCRS</td><td colspan="2">12 Inches Gravel[3]</td></tr>
<tr><td>Cushion Layer</td><td colspan="2">Geotextile Cushion[4]</td></tr>
<tr><td rowspan="3">Primary Liner</td><td colspan="2">60-mil HDPE Geomembrane[5]</td></tr>
<tr><td>GCL and a Minimum 30-mil, Geomembrane Backing[6,7,8]</td><td rowspan="2">24-inch CCL[1]</td></tr>
<tr><td>12-inch CCL[1]</td></tr>
<tr><td>Foundation Layer</td><td colspan="2">6 Inches Soil[1]</td></tr>
<tr><td>LDS</td><td colspan="2">Geocomposite[11]</td></tr>
<tr><td rowspan="2">Secondary Liner</td><td colspan="2">60-mil HDPE Geomembrane[5]</td></tr>
<tr><td>12-inch Compacted Clay[1]</td><td>--</td></tr>
<tr><td>Filter Fabric</td><td>Geotextile Cushion[2]</td><td>Geotextile[4]</td></tr>
<tr><td>Capillary Break[12]</td><td colspan="2">6-inches Gravel[1,3] or Geocomposite</td></tr>
<tr><td>Subgrade</td><td colspan="2">Re-compacted Native Soil or Compacted Soil Fill[1,9]</td></tr>
</table>

Notes:

1. Liner component soils and gravels prepared/compacted in accordance with project specifications.
2. Geotextile consists of non-woven fabric per project specifications.
3. Must comply with Construction Specification D.3.
4. Cushion layer used only if the LCRS gravel is crushed, angular gravel, or greater than 0.5-inch in diameter. Cushion layer may not be required above the capillary break if a geocomposite or the secondary geomembrane is used as the capillary break. Cushion layer consists of non-woven fabric per project specifications.
5. Single or double-side textured (textured side down).
6. $K < 5x10^{9}$ cm/sec.
7. GCL shall exhibit appropriate strength characteristics (hydrated) to accommodate stresses associated with specific landfill design parameters, with particular attention to interface, long-term creep, shear, and bearing capacity.
8. 30-mil geomembrane backing placed below the GCL and maybe part of the GCL or provided separate from the GCL.
9. Subgrade layer thickness may be increased to 3 feet as a means to establish the required separation between the base of waste.
10. Foundation layer must be constructed with clean soil.
11. Geocomposite consists of geonet bonded to geotextile filter layer on both sides.
12. Capillary break only required in the portions of the landfill where it necessary to provide 5 feet of separation between groundwater, including capillary rise and the bottom of the liner. Capillary breaks must be sloped to drain to a dedicated sump, which must be monitored in accordance with the requirements of the MRP. All capillary break sumps must include automatic pumps to ensure they remain pumped down and allow the capillary break to freely drain to maintain separation.

2. Side slope liners for **new Class II WMUs** lapping up on existing Class III landfills shall be constructed according to the specifications in Table 26 below:

Table 26: Class II Side Slope Design Requirements

	Interface Areas[1]		Perimeter Levee
	LF-1/LF-3	LF-2/LF-3	
Operations Layer	18 inches of soil[2]		
LCRS	Geocomposite[3,4]		
Base Liner	60-mil HDPE Geomembrane[5]		
	GCL and a minimum 30-mil HDPE geomembrane backing[6]		
Secondary LCRS	Geonet[7]		
Secondary Liner	60-mil HDPE Geomembrane[7]		
Capillary Break	Geocomposite[3,4]		
Subgrade	LF-1 cover soil[1]	LF-2 cover soil[2]	Berm soil[2]

Notes:

1. Refers to areas where LF-3 sideslope liner overlaps LF-1 and LF-2 sideslope cover.
2. Liner component soils and gravels prepared/compacted in accordance with project specifications.
3. Installed LCRS must comply with Title 27 Section § 20340 and have a minimum K > 1 cm/sec.
4. Geocomposite consists of geonet bonded to geotextile filter layer on both sides.
5. Single side textured geomembrane used with textured side down.
6. K < $5x10^{9}$ cm/sec per project specification. 30-mil geomembrane backing placed below the GCL and may be part of the GCL or provided separate from the GCL.
7. Secondary LCRS and liner optional on sideslopes for Class II units lapping up on a single lined Class III unit with functioning LCRS systems. Secondary LCRS and liner are required for Class II units lapping up on unlined units or units without functioning LCRS systems.

3. Proposed LCRS design for new units must comply with Title 27 (See Title 27, § 20340) as well as the following:

    a. LCRS systems must include a minimum of two test ports.

    b. LCRS systems as installed shall take into account accumulation of fines, scaling, and biofouling anticipated to occur throughout the life of the unit. Installed gravel must be graded using a sieve analysis performed using ASTM C136-01, washed, placed to optimize the packing index, be at least sub-rounded, and have a minimum K > 1 cm/sec. As outlined in the Discharger's submitted design proposal, the sieve analysis results for all

CQA sampled must meet the following sizing requirements: 100 percent less than 1/2-inch minus, 100 to 85 percent less than the 3/8-inch sieve, 0 to 35 percent less than the U.S. No. 4 sieve, and 0 to 2 percent less than the U.S. No. 200 sieve. Sieve analysis results must be submitted by the CQA officer to Board staff at least 7 days prior to installation. Gravel that does not meet these requirements cannot be used in LCRS construction. Geocomposite (or equivalent combination of geonet and filter fabric) may be used over side slopes, including LF-1 and LF-2 overlap areas.

c. LCRS sumps shall be constructed consistent with one of the two options described in Table 27 below:

Table 27: LCRS Sump Design Requirements

Component		Specification	
		Option 1	Option 2
Filter Fabric		Geotextile	
Primary Sump[3,4,8]	Gravel	Sump Gravel[1,2]	
	Pump	Automatic with high and low alarms, flow meter	
Cushion		Geotextile	
Primary Composite Liner		60-mil HDPE Geomembrane[5]	
		GCL and a minimum 30-mil HDPE geomembrane backing[6]	24 inch CCL[6]
Foundation Layer		Foundation Layer ≥ 6-inches soil[2]	
Secondary Sump Geocomposite[3]		Geocomposite	
Secondary Composite Liner		60-mil HDPE Geomembrane[5]	
		24 inch CCL[6]	GCL and a minimum 30-mil HDPE geomembrane backing[7]
Filter Fabric		Geotextile	
Capillary Break Layer		12-inches gravel[1,2]	

Notes:

1. Installed gravel must comply with Title 27 Section § 20340 and have a minimum K > 1 cm/sec.
2. Liner component soils and gravels prepared/compacted in accordance with project specifications.
3. Sump shall be equipped with an automatic pump, flow meter, and recording device, allowing instantaneous measurement of rate and volumes removed. High and low liquid level sensors and associated alarms shall also be included in design.
4. Design shall include appropriately-sized HDPE riser pipes for leachate monitoring and removal.

5. Single or double-side textured (textured side down).
6. K < 1x10-7 cm/sec per project specification.
7. 30-mil geomembrane backing placed below the GCL and maybe part of the GCL or provided separate from the GCL.
8. For sump depths of 12-inches or less, the maximum depth of leachate in the sump shall be the depth of that sump.
9. For sump depths greater 12-inches, the maximum depth of leachate in the sump shall be 12-inches.

d. The LCRS for LF-3 and LF-4 expansion modules shall, at a minimum, be constructed with LFG collection pipes installed within the LCRS layer to allow for connection to LFG control system. LCRS systems may also include perforated 4-inch HDPE laterals installed in collection troughs (or directly on base liner) and plumbed to header pipe(s) along perimeter of module. Laterals shall be equipped with pipe risers at each end to allow for video camera inspection (by wire rope or robot) and cleaning, as necessary.

e. The base of each module/phase shall be graded with a 2 percent cross slope toward a central LCRS sump or header pipe plumbed to the LCRS sump. LCRS pipes shall be constructed with a minimum 1 percent slope.

f. The design and construction of all landfill module LCRS and containment system components shall incorporate adequate factors of safety to handle the increased vertical loads associated with vertical expansion.

g. An Operations Plan to ensure the functionality of the unit's leachate management system including a description of inspection and maintenance programs which will be undertaken regularly during disposal operations and the post-closure maintenance period as required by Title 27 Section 21760 (b)(3).

4. New WMUs shall incorporate unsaturated zone monitoring devices into the design, as required by Title 27, § 21760. The proposed unsaturated zone monitoring device must comply with Title 27 prescriptive standards (See Title 27, § 20415 and § 21760).

5. All future classified units constructed at the site shall be sited, designed, and constructed to ensure compliance with Title 27 Section § 20240(c) prescriptive standards of 5 feet of separation between waste and the highest anticipated elevation of underlying groundwater. The highest anticipated elevation of underlying groundwater, in accordance with Title 27 Section § 20164, shall be calculated by adding the capillary rise (unless a sufficient capillary break is included in the design) to the highest measured groundwater elevation reported in all available historical data for that local area. See Table 24 above for required separations.

6. Final cover for all units shall, at a minimum, be constructed in accordance the following designs shall be constructed according to the specifications in Table 28 below:

Table 28: Final Cover Design Requirements

Component	Top Deck	Side Slope
Erosion Resistant Layer	≥12 inches vegetative cover soil[1]	
Low Hydraulic Conductivity (LHC) Layer	Geotextile Cushion[2]	Geocomposite[3]
	60-mil HDPE Geomembrane[4]	
	GCL or minimum 1 foot compacted soil with $K<1x10^{-6}$ cm/sec [5,6]	
Foundation Layer	≥24 inches (Minimum 12 inches clean soil overlaying minimum 12 inches of clean soil or waste soil material[7])[8]	

Notes:
1. All cover soils/materials prepared/compacted in accordance with applicable project specifications.
2. Geotextile cushion layer consists of 10 oz/yd^2 non-woven fabric.
3. Geocomposite consists of geonet bonded to geotextile filter layer.
4. Geomembrane textured on both sides.
5. $K < 5x10^{-9}$ cm/sec
6. Although the Discharger proposed a GCL for the top deck only, Title 27 Section § 21090(a)(2) requires that a low conductivity layer be placed across the entire unit. A minimum of 1 foot of clean soil compacted to attain a hydraulic conductivity of either $1x10^{-6}$ cm/sec or a GCL with equivalent protection must be used on both the top deck and side slopes.
7. Such as previously stockpiled C-soil or LC-soil.
8. The specification of 12 inches of clean soil in the top of the foundation layer was added by this WDR and was not originally proposed.

7. For areas where LF-3 sideslope liner overlaps LF-1 or LF-2 sideslope cover, a combined liner-cover system that incorporates, but does not necessarily duplicate, elements specified above for LF-3 and LF-2 overlap liner (Construction Specification D.2) and LF-3 underlap final cover (Construction Specification D.6), provided that the combined containment system meets Title 27 performance standards for both final cover and Class III (non-composite) landfill liner.

8. Class II landfill modules may use C-Soil and as part of the foundation layer for final cover. These WDRs authorize LC-soil to be used only as the foundation for the cover for LF-2.

9. New Class II units lapping up on side slopes of existing Class III units must be constructed with double lined containment systems.

10. Design reports for units lapping up on the interim covered slopes of LF-1 must specify how the cover of LF-1 will be integrated into the design for the containment system of the new unit.

11. The no units shall be built in the current footprint of the Jepson Prairie Organics operations or WP-9.1A until the Discharger has completed clean closure of those areas, submitted a Clean Closure Report with a certification that clean closure has been achieved, and has received written approval of the Clean Closure Certification report from the Regional Board. See Time Schedule Item L.5 and L.6. Clean closure of the composting facility shall meet the performance standards for cleanup set forth in Title 27, section 21090(f).

12. The Discharger shall not commence liner construction (other than preparatory earthmoving and grading) until the Central Valley Water Board has approved in writing all necessary construction plans, specifications and construction quality assurance plans related to the new liner(s).

13. **At least 120 days** prior to initiation of construction of any new landfill modules; containment system modifications or repairs to an existing classified unit or the compost facility; or closure/cover construction activities (e.g., per an FC/PCMP, Partial FC/PCMP), as approved, the Discharger shall submit for review and approval all applicable plans and reports, including, but not necessarily limited to, the following:

    a. A design for construction or closure of the unit, module, or phase complaint with the Construction Specifications of these WDRs.

    b. A construction design report, including project specifications, drawings, grading and design plans; and

    c. A Construction Quality Assurance (CQA) Plan which satisfies the requirements of Section 20324 of Title 27 as it applies to the construction of the erosion resistant and foundation layers.

    d. The submittal must specify the design consultant, engineer of record, construction contractor, CQA firm, and Chief CQA officer. The design consultant and CQA firm shall not be the same or related entities.

    Module/closure construction shall proceed only after the above (and any other applicable) reports have been approved by the Executive Officer.

14. LFG extraction facilities necessary to control LFG shall be installed within landfill waste as each new module is constructed and developed within 36 months of the

first placement of wastes in each module or sooner as needed to control landfill gas. New modules shall be tied into the existing LFG extraction system in order to help control LFG.

15. Expansion of LF-3 or LF-4 may occur in an area where corrective actions are being performed provided an Amended Report of Waste Discharge is submitted as required by Title 27 Section 20340 (i) to make appropriate changes to the corrective action program.

16. All slopes with interim cover shall be constructed and maintained in accordance with minimum safety factor of 1.5 or greater under static and dynamic conditions. Pursuant to Title 27, Section 21750(f)(5)(D), in lieu of achieving a factor of safety of 1.5 under dynamic conditions, the discharger may utilize a more rigorous analytical method that provides a quantified estimate of the magnitude of movement. In this case, the report shall demonstrate that this amount of movement can be accommodated without jeopardizing the integrity of the Unit's foundation or the structures which control leachate, surface drainage, erosion or gas.

17. All Future LF-3 and LF-4 expansion modules located within the 100-year floodplain will be constructed with interim perimeter berms with a top elevation of no less than 30.5 feet NAVD 88, to be completed prior to accepting waste in that disposal module.

18. At final buildout, a perimeter berm shall be raised to elevation of approximately 42 feet NAVD88 will be constructed along the final perimeter of the disposal modules to improve waste slope stability. The second phase will include the remaining portion of the full perimeter berm development during the construction of DM-8 and DM-11.3.

19. The Discharger shall comply with all Standard Construction Specifications listed in Section F of the Landfill SPRRs.

E. Corrective Action Specifications— Except as otherwise directed by a Cleanup and Abatement Order issued pursuant to Water Code section 13304 or Cease and Desist Order issued pursuant to Water Code section 13301, the Discharger shall comply with the following with respect to corrective action at the Facility:

1. For classified units at which the presence of LFG, LFG-impacted liquid, or LFG condensate-impacted liquid is (or has previously been) confirmed in an unsaturated zone or leak detection monitoring device (including a soil gas probe), the Discharger shall, in addition to any other necessary corrective action measures, make necessary adjustments/improvements to the LFG extraction system (e.g., increase extraction rate, upgrade extraction facilities) to remove LFG from the unsaturated zone at the unit. All such measures shall be implemented consistent with the approved LFG Controls O&M Update Plan

submitted under Time Schedule Item L.15, and, in the case of a confirmed release, either the previously approved Corrective Action Plan for the unit submitted under the previous WDRs, or the work plan for implementation of measures in response to the non-leachate fluid.

2. For classified units in which the presence of contact-surface or storm water is (or has been previously) confirmed in an unsaturated zone or leak detection monitoring device, the Discharger shall, in addition to any other necessary corrective action measures, (a) investigate and make necessary repairs to the liner edge to prevent such future breach of the landfill's waste containment system, and (b) enhance the runoff and drainage controls for that portion of the landfill.

3. Groundwater extraction and treatment for nitrate impacted areas must continue until the operative concentration limit of 5 mg/L is demonstrated using the Title 27 prescriptive proof period supported by no less than 8 samples distributed evenly over no less than 1 year.

4. If concentrations of nitrate are detected above the operative concentration limit of 5 mg/L at one or more of the downgradient POC wells on the east and southern perimeter of LF-4 the Discharger shall immediately implement the Contingency Plan described in the H.7 Workplan and within 60 days submit an engineering feasibility study (EFS) to evaluate remedial action alternatives for DM-8.1 and DM-9.

5. For the purpose of identifying the source of liquid detected in a leak detection monitoring device, the Discharger has, for each classified unit so equipped, developed sample analysis profiles of all fluids that could potentially enter the leak detection monitoring device, including, for example, landfill leachate; impacted or unimpacted storm water, surface water, or groundwater; LFG; and LFG condensate. The sample analysis profiles were be developed using both current and historical monitoring data. The sample analysis profiles shall be updated annually to include profiles of any liquid detected in a sump overlying the device in which the liquid to be identified has been detected. The analysis shall be updated annually, and results shall be provided in the Annual Monitoring Report.

6. Liquids detected in a leak detection monitoring devices (including LDS sumps, secondary LCRS sumps, and welded pan lysimeters) shall be investigated as follows:

    a. Fluid Identification

        If liquid is detected in a leak detection monitoring device, the Discharger shall follow the procedures set forth under MRP, section D.3.c and D.3.d. to confirm the identity of the liquid.

i. If the liquid is confirmed to constitute measurably significant evidence of a leachate release, the Discharger shall implement the leachate release response described below, or another response as directed by Central Valley Water Board staff.

ii. If the liquid is confirmed to constitute measurably significant evidence of a non-leachate fluid, the Discharger shall implement the non-leachate release response described below, or another response as directed by Central Valley Water Board staff.

b. Leachate Release Response

If the liquid is confirmed to constitute measurably significant evidence of a landfill leachate release, the discharger shall follow: (1) the procedures set forth in the “response to release” provisions contained in Title 27,Sections 20425 and 20430, Landfill SPRRs, Provision J.1, and Industrial SPRRs, Provision J.1, as applicable to the unit; and (2) those procedures set forth in the LCRS Sump O&M Plan relating to operating parameters and the handling, removal, and disposition of leachate, or (3) any of additional procedures directed by Central Valley Water Board Staff.

c. Non-Leachate Fluid Response

If the liquid is confirmed to constitute measurably significant evidence of a non-leachate fluid, the Discharger shall respond as follows or as otherwise directed by Central Valley Water Board staff:

i. Short Term Measures

Appropriate short term response measures may include, but not necessarily be limited to, those specified in MRP, (e.g., Central Valley Water Board notification, sampling, removal of fluid, monitoring of ongoing leak); feasible short-term measures under Corrective Action Specification D.1 if relevant (e.g., increase gas extraction rate, check liner edge for infiltration, enhance the runoff and drainage controls); and other appropriate short term measures. Documentation of short term measures shall be provided in the semiannual monitoring report(s) for the relevant time period submitted under the MRP. Any short term measures continuing six months after the date of first detection of fluid in the leak detection monitoring device shall be proposed as long term measures.

ii. O&M Plans

All short term and long term measures shall be consistent with the LCRS Sump O&M Plan and other relevant O&M plans based on

the nature or type of leak or identified fluid (e.g., Landfill Liquids Management Plan, LFG Controls O&M Plan) and/or the previously approved Corrective Action Plan for the unit submitted under the previous WDRs.

iii. Implementation Schedule

A work plan for the implementation of measures in response to the detection of non-leachate fluid in a leak detection monitoring device shall be submitted within 30 days of approval of the liquid identification profile report. If necessary, construction reports proposing or documenting repairs to the landfill's containment system to address the leak (or other cause of the detected fluid) shall be prepared and submitted consistent with Construction Specification E.9 and the Standard Construction Specifications listed in Section F of the Landfill SPRRs, as applicable. All response measures necessary to fix and prevent reoccurrence of the leak (or other cause of the detected fluid) shall be completed within 18 months of the date it was originally detected, or sooner if directed by Board staff.

7. For all units/modules in a corrective action program to address a release from the unit/module, the Discharger shall implement all corrective measures necessary to remediate the release and prevent a continued or subsequent release from the Unit, including, but not necessarily limited to, repairs, cleanup, and source control. Additional measures shall be implemented, as appropriate, if monitoring data indicates that cleanup is not being achieved in a reasonable timeframe and/or if waste constituent concentrations are increasing. To demonstrate cleanup of all water-bearing media affected by the release, the Discharger shall complete the applicable proof period under Title 27, section 20430(g) for each such media.

F. Closure & Post-Closure Maintenance Specifications—Except as otherwise directed below, the Discharger shall comply with all Standard Closure and Post-Closure Specifications (SPRRs, § G) and closure-related Standard Construction Specifications (SPRRs, § F), as well as the following with respect to closure of landfills at the Facility.

1. The Discharger shall submit a Final or Partial Final Closure and Post Closure Maintenance Plan (CPMP), in accordance with section G of the SPRRs, at least two years prior to the proposed closure of any portion of any landfill.

2. By **1 October 2023**, the Discharger shall submit a FC/PCMP for LF-1 consistent with the construction specifications (e.g., Construction Specification D.6) and other applicable requirements of this Order. The FC/PCMP shall include plans for

closure, or phased closure, of all portions of the unit, including top deck and sideslopes of DM-1A and DM-1B. The FC/PCMP shall include a landfill final cover design (consistent with the construction specifications of these WDRs), description of closure activities, a schedule, closure and postclosure cost estimates, slope stability analysis, and all other information required under Title 27, section 21769(c). See Time Schedule Item L.9.

3. By **15 October 2024**, the Discharger shall complete closure of existing landfill unit LF-1 and within 30 days thereafter submit a certification that the landfill has been closed consistent with Standard Closure and Postclosure Specification G.23, Landfill SPRRs. The submittal must specify the design consultant, engineer of record, construction contractor, CQA firm, and Chief CQA officer. The design consultant and CQA firm shall not be the same or related entities. See Time Schedule Item L.10.

4. The Discharger shall obtain revised WDRs prior to closure of any landfill with a final cover other than the one(s) approved herein.

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

6. During or after final cover installation, the Discharger may perform minor modifications to problematic areas of the final cover, provided that: (a) the barrier layer of the final cover (e.g., geomembrane, GCL and/or compacted clay layer) remains intact; and (b) the Central Valley Water Board approves of such modifications.

6. If the final cover incorporates a geomembrane barrier, all edges of the final cover shall be sealed by connecting to the liner.

7. Critical interfaces of the final cover shall be laboratory-tested to ensure minimum design shear strength. The results of such testing shall be reported to the Central Valley Water Board as part of the Construction Quality Assurance (CQA) Report.

8. Landfill final cover designs proposed in preliminary or final closure plans submitted under this Order shall be consistent with the prescriptive standard or options specified in Construction Specifications Section. Any proposal for an EAD final cover included in a FCP or Partial FCP shall be accompanied by the requisite demonstration under Title 27, section 20080(b) and (c), including, but not limited to, a demonstration that construction of the prescriptive standard is infeasible and that the proposed EAD meets or exceeds Title 27 performance standards for final cover. Such demonstration may require a field pilot project or test pad.

9. Any proposal for final cover included in a preliminary, final, or partial final closure plan for a landfill unit shall meet the requirements of Title 27 and Subtitle D, including the requirement that that the permeability of the LHC layer be no greater than that of the base liner or underlying natural geologic materials (whichever is less). See Title 27, section 21090(a)(2) and 40 CFR 258.60(a)(1).

10. Closed or partially closed landfill unit side slopes shall be no steeper than 2.5H:1V, and closed top deck areas shall be sloped at three percent or greater. Interim slopes steeper than 2.5H:1V are permissible, provided they are supported by an approved slope stability analysis report.

11. The Discharger shall install and maintain an active landfill gas extraction system appropriately sized to remove LFG from closed landfill units throughout the postclosure period. Landfill gas shall be extracted from closed landfill units until such time that the landfill gas is no longer a threat to water quality as documented by the Discharger and approved by the Executive Officer.

12. For closure designs including geomembrane and/or GCL, the Discharger shall seal the edges of the final cover by connecting its components to the base liner (i.e. welding the base liner to the cover liner in the anchor trench).

13. 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.

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

15. The completed final cover will be periodically tested for damage or defects by monitoring surface emissions pursuant to California Code of Regulations, title 17, section 95471(c) and Title 27, section 21090(a)(4)(A). Defects will be repaired and tested for adequacy based on the closure CQA Plan.

16. The Discharger shall comply with all Standard Closure and Post-Closure Specifications listed in Section G, and all closure-related Standard Construction Specifications listed in Section F, of the Landfill SPRRs.

17. Existing units/modules in the area of each phase (i.e., WP-9.1A and compost ponds) shall be clean closed, as documented in a clean closure certification report approved by Central Valley Water Board staff. Prior to beginning construction of the geosynthetics for new units, the Discharger shall remove impacted vadose zone materials and show one year of decreasing groundwater trends in the footprint of the proposed disposal module. See also Construction Specification D.11 and Title 27 Section 21090.

18. **At least 90 days** prior to cessation of operations at WP-9.1A, the Discharger shall submit a clean closure work plan for the unit. All clean closure plans for Class II waste piles shall be prepared in accordance with Title 27 CCR Section 21410. See Time Schedule Item L.5.

19. No clean closure activities may be conducted at a unit in the absence of a clean closure work plan approved by Central Valley Water Board staff.

20. No clean closure excavation activities shall be conducted during the wet season.

21. The Discharger shall comply with all Standard Closure and Postclosure Specifications listed in Section G, and all Standard Storm Water Provisions listed in Section L of the Industrial SPRRs.

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

1. The Discharger shall obtain and maintain assurances of financial responsibility with CalRecycle for closure and post-closure maintenance of the landfill units at the site in at least the amounts of the cost estimates in the 10 December 2021 Updated JTD, as adjusted for inflation annually. As of 10 December 2021, these amounts were, in 2021 dollars, $3,341,513 for closure of LF-1, $29,600,956 for the closure of LF-2, LF-3, and LF-4, $565,980 for the closure of WP-9.1A, (a total of $33,508,449 in 2021 dollars for closure of all units) and $12,305,468 for the post closure maintenance for the entire facility. A report regarding financial assurances for corrective action shall be submitted to the Central Valley Water Board by **1 June of each year** the Central Valley Water Board by 1 June of each year. This may be the same report that is submitted to CalRecycle for this purpose. If CalRecycle determines that either the amount of coverage or the mechanism is inadequate, then within 90 days of notification, the Discharger shall submit an acceptable mechanism to CalRecycle and the Central Valley Water Board for at least the amount of the approved cost estimate.

2. The Discharger shall update the most recently approved PC/PCMP any time there is a change that will increase the amount of the closure and/or post-closure maintenance cost estimate. The updated PCPCMP shall be submitted to the Central Valley Water Board, the Local Enforcement Agency, and CalRecycle. The PC/PCMP shall meet the requirements of Title 27, section 21769(b), and include a lump sum estimate of the cost of carrying out all actions necessary to close each Unit, to prepare detailed design specifications, to develop the final closure and postclosure maintenance plan, and to carry out the first thirty years of post-closure maintenance. Reports regarding financial assurance required in I.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 $1,590,496 in 2021 dollars including the annual inflation-adjusted cost estimate. A report regarding financial assurances for corrective action shall be submitted to the Central Valley Water Board by **1 June of each year**. This may be the same report that is submitted to CalRecycle for this purpose. If CalRecycle determines that either the amount of coverage or the mechanism is inadequate, then within 90 days of notification, the Discharger shall submit an acceptable mechanism to CalRecycle and the Central Valley Water Board for at least the amount of the approved cost estimate.

4. The operative Preliminary CPMP shall include all components required per Title 27, section 21769(c), and include a lump sum cost estimate for:
    a. Completion of all actions required for closure of each WMU;
    b. Preparation of detailed design specifications;
    c. Development of a Final CPMP; and
    d. Undertaking at least 30 years of post-closure maintenance, including ongoing corrective action such as pumping down of the borrow pit to maintain separation for LF-1.

9. Whenever changed conditions increase the estimated costs of closure and post-closure maintenance, the Discharger shall promptly submit an updated CPMP to the Central Valley Water Board, CalRecycle and the LEA for review.

10. The Discharger shall comply with all Standard Financial Assurance Specifications listed in Section H of the Landfill SPRRs.

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

1. The Discharger shall comply with the detection and corrective action monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone in accordance with these WDRs and MRP R5-2022-0047.

2. The Discharger shall implement the Water Quality Protection Standard (WQPS) set forth in these WDRs and the operative MRP (see also Title 27, § 20390); and shall verify the compliance of each WMU with each subsequent monitoring event.

3. For all WMUs, the Discharger shall implement a groundwater, surface water and unsaturated zone detection monitoring program (DMP) in accordance with Title 27, sections §20385, §20415 and §20420. 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 in Attachment A. If Board staff approves updated concentration limits based on a Revised WQPS report in the future the concentration limits established in that formal approval letter supersede those in Attachment A. The background wells and point of compliance wells for each landfill unit are described in Table 29 below:

Table 29: Background and Point of Compliance Wells

Landfill Unit	Background Wells	Point of Compliance Wells
Landfill 1	G-7, G-8, P-1	G-9[1], G-10U[1], G-60A, MW-4
Landfills 2/3	G-59, 4BR	G-11[1], G-27[1], G-58[2]
Landfill 4	G-4R, G-17, G-18	G-16R, G-25R[2], G-28R[2], G-29R[2], G-30R[2], G-53[3], G-54[3], G-56, G-57
Waste Pile 9.1A	G-4R, G-17	CP-1S[4], CP-1D, CP-4S[4], CP-4D

Notes:
1: Shallowest wells G-9, G-10U, G-11, and G-27 will be sampled if there is sufficient water. If these wells are dry, then the corresponding next deeper well (G-9A, G- 10M, G-11M, G-27A) will be sampled, if there is sufficient water. If these corresponding deeper wells are also dry, then, if available, the next deeper well (G- 10R and G-11R) will be sampled.
2: Existing wells G-12, G-25, G-28, G-29, or G-30 will only be sampled if a concentration limit is exceeded at the corresponding upgradient replacement well.
3: Wells G-53 and G-54 will eventually be abandoned with the construction of future unit DM-8.3.
4: CP-1S and CP-4S are screened in perched zones, and are only required to be sampled if water is present.
5: If Board staff approves an updated monitoring network based on a Revised WQPS report in the future the monitoring network established in that formal approval letter supersedes the network described above.

4. 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 R5-2022-0047 and the Landfill SPRRs.

5. GPS coordinates of location where surface water samples are taken must be included in the monitoring report that reports that data. The Discharger must sample from consistent locations, within 10 feet of previous samples.

6. Separation of waste to groundwater shall be calculated by measuring the groundwater elevation in an appropriately installed and located groundwater elevation monitoring device, designated in Attachment B, and comparing that measurement to the compliance elevation for that unit as designated in Attachment B. The designated separation monitoring device should change to the piezometer installed to monitor the compliance elevation at each sump once the work required by Time Schedule Item L.12 is completed and approved by Board staff.

7. Detection monitoring data analysis methods, including those used for analysis of background data, shall be in accordance with Title 27, section 20415(e)(7) through (e)(10) and the MSW Landfill or Industrial SPRRs, as applicable.

8. In the event of a release, the data analysis methods shall also include trend analysis; an evaluation of the water chemistry; and preparation of contaminant contour plots to monitor the nature of the release and effectiveness of corrective action measures, as specified in the MRP.

9. As permitted by Title 27, section 20430(f) and 40 CFR part 258.58(e)(2), corrective action may be terminated when the Discharger demonstrates that the constituents of the release have been reduced to levels at or below their respective concentration limits throughout the entire zone affected by the release. The Discharger may make this demonstration by satisfying a “proof period.” The “proof period” shall consist of at least eight sampling events for each monitoring point that are approximately evenly distributed over a minimum of a one-year period in which the concentration of the constituents of the release remain at or below their respective sampling limit. The term “monitoring point” shall mean either a point of compliance or an alternative monitoring location proposed by the Discharger and approved by Water Board staff that adequately monitors groundwater quality while still enabling sequenced landfill development. The Discharger may make this demonstration while corrective action measures are either continuing or have been suspended or modified as approved by Water Board staff.

10. The Discharger shall adequately monitor soil pore gas along the perimeter of each landfill unit for the presence of LFG in concentrations that may threaten water quality or otherwise warrant adjustments or improvements to the LFG extraction system, including the installation of additional gas extraction or monitoring wells.

11. Any proposal for concentration limits greater than background (CLGBs) shall be accompanied by the requisite demonstration under Section 20400(c) (i.e., that it is technologically or economically infeasible to achieve the background value for that constituent and that the constituent will not pose a substantial present or potential hazard to human health or the environment). Approval of CLGBs shall require approval of revised WDRs by the Central Valley Water Board.

12. All elevations reported must be in NAVD 88.

13. For each WMU required to initiate an evaluation monitoring program, the Discharger shall implement an evaluation monitoring program in accordance with Title 27, sections §20385, §20410, §20415 and §20425, and Section I Standard Monitoring Specifications of the SPRRs.

14. For each WMU subject to corrective action, the Discharger shall implement a corrective action monitoring program (CAMP) in accordance with Title 27, sections 20385, 20415 and 20430, and Section I of the SPRRs.

15. The Discharger shall comply with all Standard Monitoring Specifications listed in Section I of both the Landfill SPRRs and Industrial SPRRs, as applicable to the unit.

16. Precipitation data, pan evaporation data, temperature data, and wind data collected from the onsite weather station must be reported in the Annual Monitoring Report.

I. Reporting Requirements—In addition to those Standard Provisions pertaining to notification and reporting obligations (see, e.g., §§ K.1-2, K.6, K.8-10), the Discharger shall comply with the following provisions.

1. The Discharger shall comply with all MRP provisions pertaining to the submittal and formatting of reports and data.

2. Reports shall be submitted electronically via the State Water Board's GeoTracker Database (https://geotracker.waterboards.ca.gov). After uploading, the Discharger shall notify Central Valley Water Board staff via email at CentralVallySacramento@WaterBoards.ca.gov. The following information shall be included in the body of the email:

Attention:	Title 27 Compliance & Enforcement Unit
Report Title:	[Title]
GeoTracker Upload ID:	5A480300001
Facility:	Recology Hay Road Landfill and Jepson Prairie Organics
County:	Solano County
CIWQS Place ID:	CW-244435

3. All technical reports submitted under this Order shall be prepared by, or under the direct supervision of, a California-licensed civil engineer or engineering geologist. For the purposes of this section, a “technical report” is a report incorporating the application of scientific or engineering principles.

J. Time Schedule —The Discharger shall complete the following tasks in accordance with the specified deadlines:

Table 30-Time Schedule Items

Item No.	Item	Task Description	Deadline
1.	New Unit Design Plans (General)	Submit construction and design plan(s) for review and approval in accordance with Section D of this Order, and Section F of the SPRRs. The submittal must specify the design consultant, engineer of record, construction contractor, CQA firm, and Chief CQA officer. The design consultant and CQA firm shall not be the same or related entities. Any previously submitted design that have not yet been approved must be revised to meet the requirements of this WDR and resubmitted for review.	**90 Days Prior to Proposed Construction**
2.	CQA Reports (General)	Submit construction report(s) for review and approval upon completion demonstrating construction was in accordance with approved construction plans and Section F.27 of the SPRRs.	**60 Days Prior to Proposed Discharge to Unit(s)**
3.	Final and/or Partial Closure Documents (General)	Submit final or partial final closure and post-closure maintenance plan (PCMP), design plans, and CQA plan for review and approval, in accordance with Section E of this Order and Section G of the SPRRs. The submittal must generally define how the cover and LFG management system of LF-1 and LF-2 will be integrate into the containment system of lapped up units including DM-2.3, DM-10, and DM-11.3	**2 Years Prior to Closure**
4.	Compost Operation Clean Closure Workplan	Submit a workplan to complete the following items in the area of the Jepson Prairie Organics at closure: a. Remove all material, equipment, infrastructure, waste, waste	**180 days prior to ceasing composting operations at JPO**

Item No.	Item	Task Description	Deadline
		residues, and contaminated containment system components; b. Remove or decontaminate all contaminated subsoils and all other contaminated materials including underlying groundwater; The plan shall include a description of all clean closure activities, cleanup levels for soil and groundwater, and a monitoring program to evaluate compliance. Clean closure of the composting facility shall meet the performance standards for cleanup set forth in Title 27, section 21090(f).	
5.	WP-9.1A Clean Closure Workplan	Submit a clean closure work plan for the unit. All clean closure plans for Class II waste piles shall be prepared in accordance with Title 27 CCR Section 21410.	**At least 180 days prior to cessation of operations at WP-9.1A**
6.	Clean Closure Certification Report (General)	Submit a Clean Closure Certification Report that describes all work that was completed to comply with the requirements of Provision L.4 or L.5 and includes a certification statement that clean closure has been achieved, supported by adequate groundwater and soil data.	**90 days after completing Clean Closure activities at JPO or WP-9.1A**
7.	C-Soil Stockpile Workplan	Submit a workplan to make all necessary improvements to the C-Soil stockpiles to comply with the relevant requirements of this Order, including installing a uniform intermediate cover over all piles, ensuring slopes do not exceed 3:1, and installing stormwater controls.	**1 October 2022**
8.	Weather Station Installation	Submit certified statement and documentation that a weather station has been installed onsite capable of collecting	**1 October 2022**

Item No.	Item	Task Description	Deadline
		precipitation data, pan evaporation data, temperature data, and wind data.	
9.	Updated Final Closure Plan for LF-1, Partial Final Closure Plan and Postclosure Maintenance Plan	Submit an updated plan for the Final Closure and Post Closure Maintenance Plan (FC/PCMP) for LF-1 with an updated closure schedule. The FC/PCMP must include appropriate benches in the design, include a geosynthetic layer in the cover for the entire LF unit, and generally define how the cover and LFG management system of LF-1 will be integrated into the containment systems of future lapped up units. The submittal shall include a Soil Plan that describes how the Discharger will ensure enough soil will be available onsite for the closure of LF-1 in time to comply with the closure date set by these WDRs. The revised FC/PCMP shall also include a new slope stability analysis that complies with all requirements of Title 27 Sections § 20370, § 21750 (f)(5), and Subtitle D. If the calculated final cover displacement exceeds 6-inches the submittal shall include a statement, stamped by a California licensed engineer, certifying that the calculated seismically induced displacements complies with all requirements of Title 27 Sections § 20370, § 21750 (f)(5), and Subtitle D, along with all necessary supporting engineering rationale for that certifying statement. The seismic analysis must account for the varying density for the waste in the unit, the distribution of heavy waste near the top of the unit, all critical slopes, saturated waste conditions, and the geosynthetic component of the cover.	**15 December 2022**
10.	LF-1 Closure Report	Submit a closure report with stamped as-builts and a certification that the landfill has been closed consistent with the approved Updated Final Closure Plan for LF-1 and	**1 July 2025**

Item No.	Item	Task Description	Deadline
		the Standard Closure and Postclosure Specification G.23, Landfill SPRRs.	
11.	Unsaturated Zone Monitoring Report	Submit detailed plans and equipment specifications, including all items required by Title 27 Section 21760 (a)(3), regarding unsaturated zone monitoring devices. The submittal must include an evaluation of methods to monitor the unsaturated zone beneath all existing landfill units and WP-9.1A in compliance with Title 27 Section § 20415. Unsaturated zone monitoring systems must be capable of measuring both soil pore liquids and soil pore gas COC concentrations that may exist as a result of a release from the WMU. The evaluation shall include a proposal to install any necessary monitoring devices to implement a monitoring network that complies with the requirements of Title 27 Section § 20415 for the unsaturated zone for all landfill units and WP-9.1A.	**31 March 2023**
12.	Separation Monitoring Device Workplan	Submit a workplan for the installation of monitoring devices adjacent to each LCRS sump of each classified unit to measure the groundwater elevation per Facility Specification C.1. Classified units that already have monitoring devices adjacent to their LCRS sump may be excluded. The plan must also propose to replace no less than 3 monitoring devices around LF-1 to measure the groundwater elevation per Facility Specification C.1.	**1 November 2022**
13.	Separation Monitoring Device Installation Report and Designation	An installation report demonstrating installation and operability of the monitoring devices installed under Item 11 above, and a proposed of a monitoring device or set of monitoring devices for each classified unit that will be used to determine separation	**1 August 2023**

Item No.	Item	Task Description	Deadline
		for compliance with Facility Specification C.1.	
14.	DM-1A Leachate Well Evaluation	Submit report evaluating the effectiveness of the existing leachate wells installed in DM-1A for reducing leachate discharge to groundwater and LFG production. The report must also evaluate the benefit of installing additional leachate or dual phase extraction wells within DM-1A.	**31 March 2023**
15.	Landfill Gas Controls Evaluation and O&M Plan Update	Submit an evaluation of the landfill gas extraction system for each landfill unit. The evaluation must evaluate the current well/acre ratio, and propose any necessary upgrades to the system to prevent future detections of VOCs in welded pan lysimeters and unsaturated zone monitoring devices.	**1 March 2023**
16.	Leachate/ Condensate Tank Workplan	Submit a workplan to upgrade all leachate tanks with secondary containment systems to catch any leaks or spills of the liquid.	**1 May 2023**
17.	LCRS Sump and Capillary Break Layer O&M Plan Update	Submit a plan to ensure that all LCRS and capillary layers are properly operated. The plan must include short term and long term response measures are timely implemented in response to foreseeable events such as a LCRS sump leak, the detection of fluid other than leachate in a sump, and/or a release from the unit under Title 27. The plan shall also include a description of the operation and maintenance procedures for all LCRS sumps and capillary layers at the site including landfill and waste pile modules. For each type of sump (e.g., primary, secondary/leak detection, welded pan lysimeter) at each unit, the plan shall describe the sump's design, purpose,	**1 June 2023**

Item No.	Item	Task Description	Deadline
		operating parameters; monitoring facilities; action leak rate; short term and long term response plans in the event of a sump leak; notification of a release procedure; and the handling and disposition of any collected liquid (e.g., tanks, returned to landfill or primary LCRS). For each unit constructed with a capillary break layer the plan must include a description of how they will be operated and maintained, including procedures to monitor for functionality, pump out liquid, and properly dispose of liquid.	
18.	Perched Zone Evaluation	Submit an evaluation using existing boring logs and the Conceptual Site Model to identify potential intermittent or permanent perched zones above the water table. The evaluation must present information on depth, extent, and estimate how much water they can produce per day.	**1 September 2023**

K. General Provisions

1. The Discharger shall maintain a copy of this Order at the facility, including the MRP R5-2022-0047, the Landfill SPRRs dated December 2015, and the Industrial SPRRs dated April 2016, which are part of this Order, and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.

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

3. The Discharger shall comply with MRP R5-2022-0047, which is incorporated into and made part of this Order by reference.

4. The Discharger shall comply with the applicable portions of the Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Subtitle D and/or Title 27, dated April 2016.

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

6. All reports required by this Order shall be submitted pursuant to Water Code section 13267, and shall be prepared by a California-registered Civil Engineer or Certified Engineering Geologist as appropriate.

LIST OF ATTACHMENTS

Attachment A—Constituents of Concern, Approved USEPA Analytical Methods, and Groundwater Concentration Limits
Attachment B—Lowest Elevation of Waste and Compliance Elevations for Separation of Waste from Groundwater Requirements
Attachment C—Location Map
Attachment D—Area Map
Attachment E—Facility Map
Attachment F—Current and Planned Units with Leachate Management Features Map
Attachment G—Potentiometric Surface Map, 1st Quarter 2022
Attachment H—Potentiometric Surface Map, 3rd Quarter 2021Attachment I—Landfill Gas Collection and Control Systems Map
Attachment J—Landfill Soil Gas Probes Map
Attachment K—Stormwater Controls Map
Attachment L—Nitrate as N Plume Map (Data from Second Semiannual 2021 Event)
Attachment M—Final Closure Design and Leachate Management Features

Standard Provisions and Reporting Requirements for Non-Hazardous Discharges of Waste Regulated under Subtitle D and/or Title 27, December 2015 Edition (SPRRs or Standard Provisions)

Information Sheet

Monitoring and Reporting Program R5-2022- (separate document)

ENFORCEMENT

If, in the opinion of the Executive Officer, the Dischargers fail to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order may result in the assessment of Administrative Civil Liability of up to $10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

ADMINISTRATIVE REVIEW

Any person aggrieved by this Central Valley Water Board action may petition the State Water Board for review in accordance with Water Code section 13320 and California Code of Regulations, title 23, section 2050 et seq. To be timely, the petition must be received by the State Water Board by 5:00 pm on the 30th day after the date of this Order; if the 30th day falls on a Saturday, Sunday or state holiday, the petition must be received by the State Water Board by 5:00 pm on the next business day. The law and regulations applicable to filing petitions are available on the State Water Board website (http://www.waterboards.ca.gov/public_notices/petitions/water_quality). Copies will also be provided upon request.

ATTACHMENT A—CONSTITUENTS OF CONCERN, APPROVED USEAP ANALYSTICAL METHODS, AND GROUNDWATER CONCENTRATION LIMITS

Constituent of Concern	USEPA Test Method	Groundwater Concentration Limit			
		LF-1	LF-2/3	LF-4	WP-9.1A
General Minerals (mg/L)					
pH	150.3	7.25-7.85	7.5-8.05	7.2-7.85	7.25-7.8
Bicarbonate Alkalinity	2320B	750	550	525	500
Calcium	200.7/600	97	95	96	100
Carbonate	2320B	18.5	---*	20	10
Chloride	300	265	520	700	665
Magnesium	200.7/600	120	141	191	185
Phosphate	300	0.5	---*	1	1
Potassium	200.7/600	1.2	3.2	1.65	0.95
Sodium	200.7/600	235	320	320	275
Sulfide	300	0.1	0.1	0.1	0.1
Nitrogen Compounds (mg/L)					
Ammonia Nitrogen	4500-NH_3	0.18	0.15	0.41	0.35
Nitrate as N	300	5	5	5	5
Nitrite as N	300	0.1	0.8	0.1	0.1
Nitrogen (Nitrate + Nitrite)	353.2	4.5	---*	10.2	3.9
Other Parameters					
Phosphorus, mg/L	365.3	0.1	0.15	0.5	0.5
Total Alkalinity, mg/L	2320B	785	525	542	585
Total Dissolved Solids, mg/L	2540C	1410	1720	2050	2000
Specific Conductance (EC), umhos/cm	2510	1775	2900	3250	3050
Total Organic Carbon, mg/L	415.1	3.3	2.2	2.4	2.3
Dissolved Inorganics (µg/L)					
Aluminum	6010	50	25	80	20
Antimony	7041	50	10	10	10
Arsenic	7062	5	15	20	8
Barium	6010	560	60	165	65
Beryllium	6010	2	---*	1	1

Constituent of Concern	USEPA Test Method	Groundwater Concentration Limit			
		LF-1	LF-2/3	LF-4	WP-9.1A
Cadmium	7131A	1	1	1	1
Chromium (total)	6010	6	6	10	12
Cobalt	6010	5	---*	5	5
Copper	6010	10	5	5	5
Iron	6010	230	280	310	50
Lead	7421	6	8	15	17
Manganese	6010	200	200	200	200
Mercury	7470A	0.1	---*	0.1	0.1
Nickel	7521	25	---*	8	10
Selenium	7742	1	---*	100	75
Sulfate	9030B	110	325	280	350
Silver	6010	5	1	1	1
Thallium	7841	5	---*	5	5
Tin	6010	---*	---*	---*	---*
Vanadium	6010	8	5	7	5
Zinc	6010	20	20	20	20
Volatile Organic Compounds (µg/L)	8260B	ND	ND	ND	ND
Semi-Volatile Organic Compounds (µg/L):	8270	ND	ND	ND	ND
Chlorophenoxy Herbicides (µg/L)	8151A	ND	ND	ND	ND
Organophosphorus Compounds	8141B	ND	ND	ND	ND

Notes:

* Insufficient data to develop a statistically significant concentration limits.

ATTACHMENT B—LOWEST ELEVATION OF WASTE AND COMPLIANCE ELEVATIONS FOR SEPARATION OF WASTE FROM GROUNDWATER REQUIREMENTS

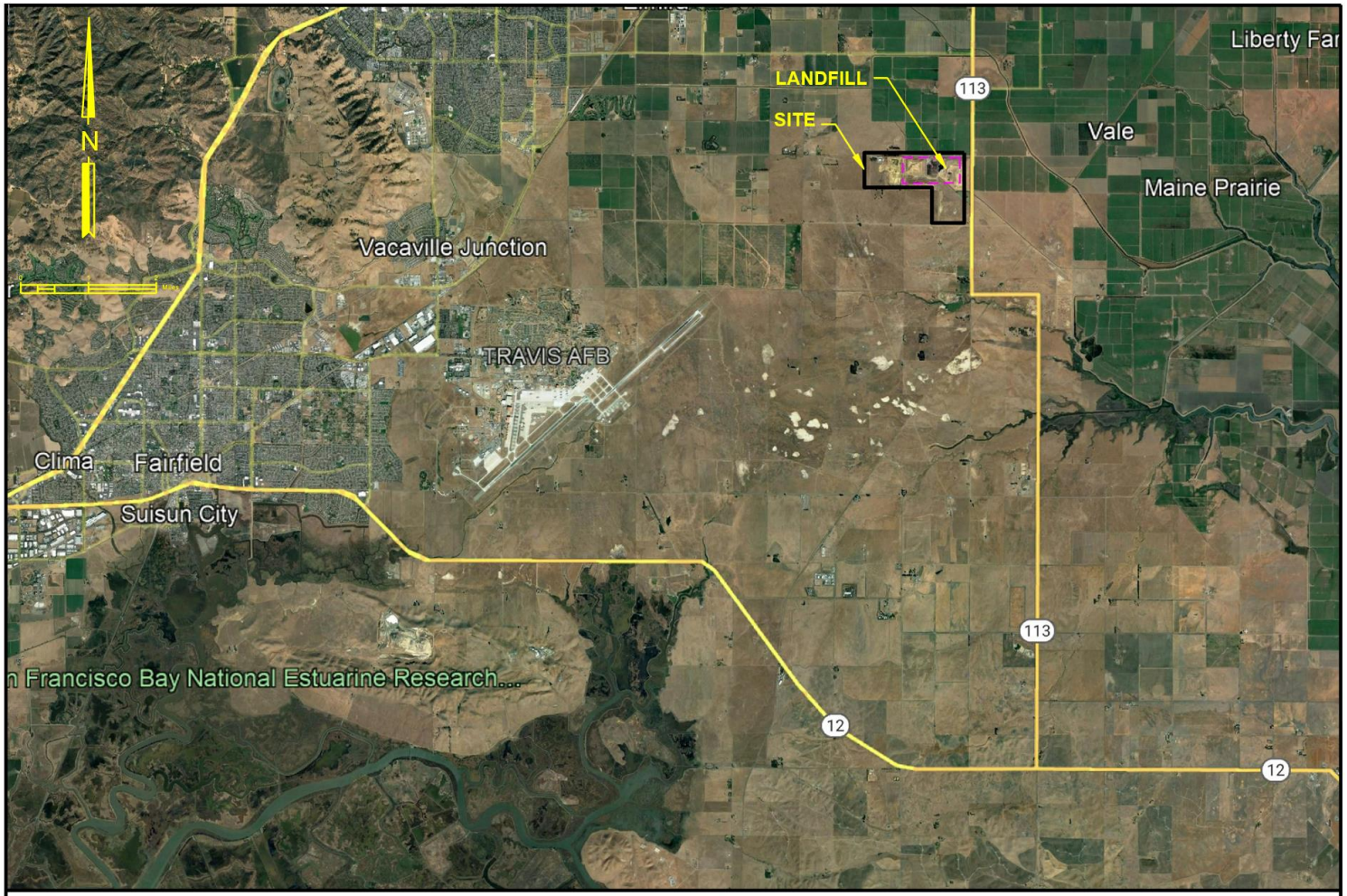
Module	Leachate Sump ID	Designated Monitoring Device	Lowest Waste Elevation (NAVD 88/NGVD 29)[1,2,6]	Required Separation (feet)	Compliance Elevation (NAVD 88/NGVD 29)[1,4]
DM-1A	--	Various[7,8]	12.67 / 10.14[3]	5.0	7.67 / 5.14
DM-1B	S-1	PZ-S1	8.1 / 5.6	5.0	3.1 / 0.6
DM-2.1	S-2.1	G-35[7], G-58[7]	25.3 / 22.8	3.0	22.3 / 19.8
DM-2.2A	S-2.2A	G-11R[7]	28.6 / 26.1	2.5	26.1 / 23.6
DM-2.2B	S-2.2B	G-12[7]	28.2 / 25.7	2.5	25.7 / 23.2
DM-3.1	S-3.1	PZ-3.1B	22.8 / 20.3	2.5	20.3 / 17.8
DM-3.2	S-3.2	G-29R[7]	22.4 / 19.9	2.5	19.9 / 17.4
DM-3.3	S-3.3	PZ-3.3	23.4 / 20.9	2.5	20.9 / 18.4
DM-4.1	S-4.1	G-16R[7]	22.9 / 20.4	2.5	20.4 / 17.9
DM-5.1A	S-5.1A	G-16R[7]	24.5 / 22.0	2.5	22.0 / 19.5
DM-5.1B	S-5.1B	G-16R[7]	24.2 / 21.7	2.5	21.7 / 19.2
DM-5.2	S-5.2	G-18[7]	24.5 / 22.0	2.5	22.0 / 19.5
DM-6	S-6	G-17[7]	25.6 / 23.1	2.5	23.1 / 20.6
DM-7	S-7.2	G-32[7]	24.6 / 22.1	2.5	22.1 / 19.6
DM-8.1	S-8.1	G-54[7,9], G-56[7]	36.0 / 33.5	5.0	31.0 / 28.5
DM-9.1	S-9.1	G-17[7]	30.0 / 27.5	5.0	25.0 / 22.5
DM-11.1	S-11.1	G-52[7], G-52A[7]	27.8 / 25.3	2.5	25.3 / 22.8
DM-11.2	S-11.2	G-59[7]	27.2 / 24.7	2.5	24.7 / 22.2
Future DMs[5]	N/A	TBD[5]	TBD[5]	5.0	TBD[5]
WP-9.1A	S-9.1A	G-4R, G-17[7]	27.8 / 25.3	2.5	25.3 / 22.8

Notes:

1. All elevation units in feet NAVD 88/NGVD 29.
2. Lowest elevation of waste for lined units is primary LCRS sump or lowest waste elevation for unlined units, unless otherwise footnoted.
3. Lowest elevation of solid waste in unlined unit/module in feet NAVD 88 based on 2018 waste boring investigation.
4. Maximum allowable groundwater separation at the low point of the landfill module equals lowest waste elevation minus minimum required groundwater separation. Groundwater elevations may be higher at locations where was the waste elevations are higher provided the minimum groundwater separation distance is maintained.
5. Future module (to be constructed per WDR construction specifications).
6. Historically, the Recology Hay Road has always surveyed elevations using the

NGVD29 datum and these elevations were often referred to as “MSL” The term MSL and NGVD29 has been used interchangeably in past reports.
7. Primary monitoring device(s) currently used by Board staff to determine compliance with separation requirements. These WDRs require the Discharger to submit a workplan to install piezometers adjacent to all sumps that don’t currently have them, which will be used in the future to determine compliance with separation requirements. See Time Schedule Item L.12.
8. Includes PZ-DM1SE, PZ-DM1N, PZ-DM1NE, PZ-DM1NW, PZ-DM1S, PZ-DM1SER, VWT-1BR, VWT-7BR, VWT-10BR, VWT-13.
9: G-54 will be used as a means to measure compliance until it is abandoned as part of the construction of DM-8.2, at which point G-56 shall be used.

ATTACHMENT C: LOCATION MAP



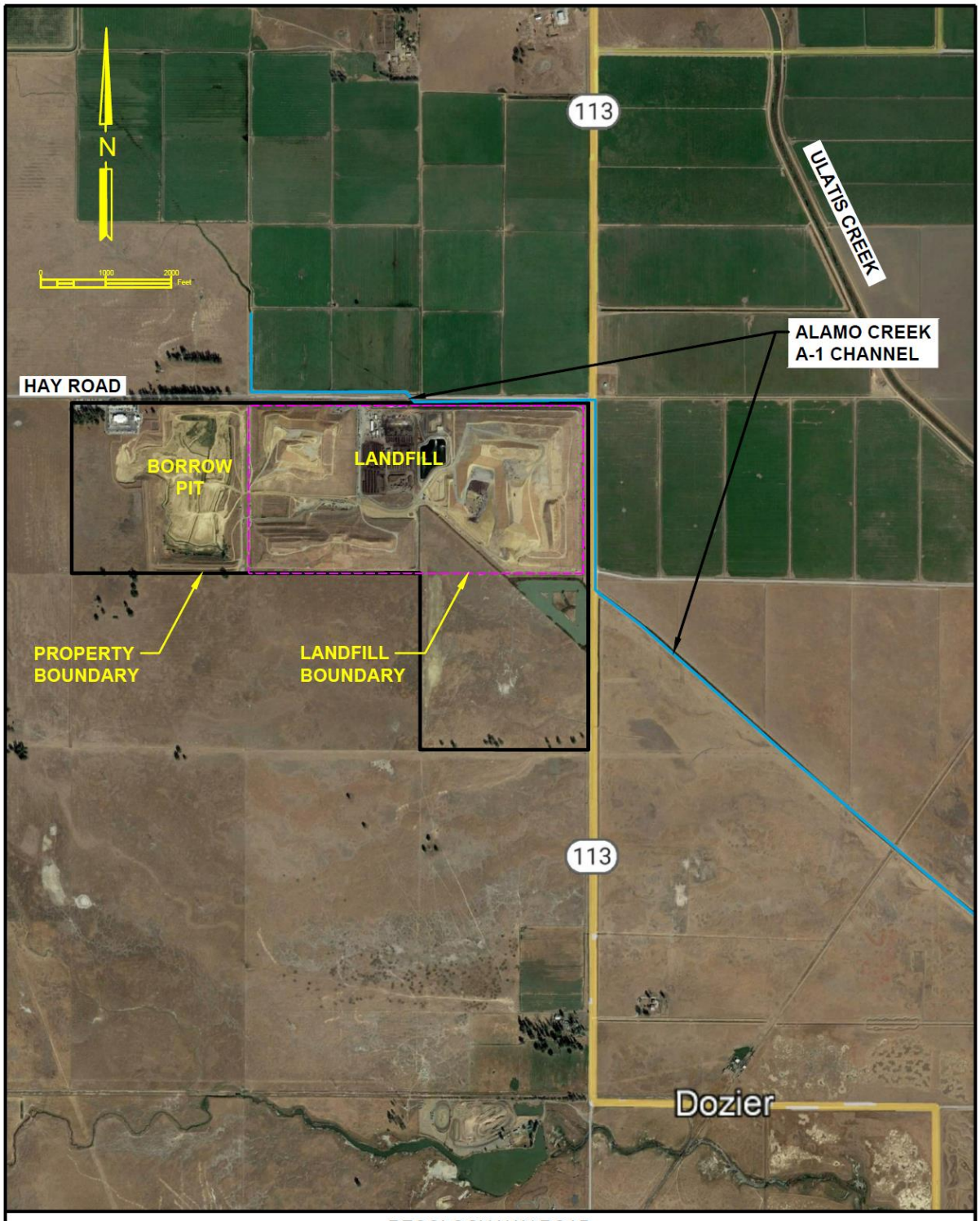
RECOLOGY HAY ROAD

ATTACHMENT C - LOCATION MAP

RECOLOGY HAY ROAD LANDFILL, SOLANO COUNTY

SECTION 2, T5N, R1E, MDB&M

ATTACHMENT D: AREA MAP



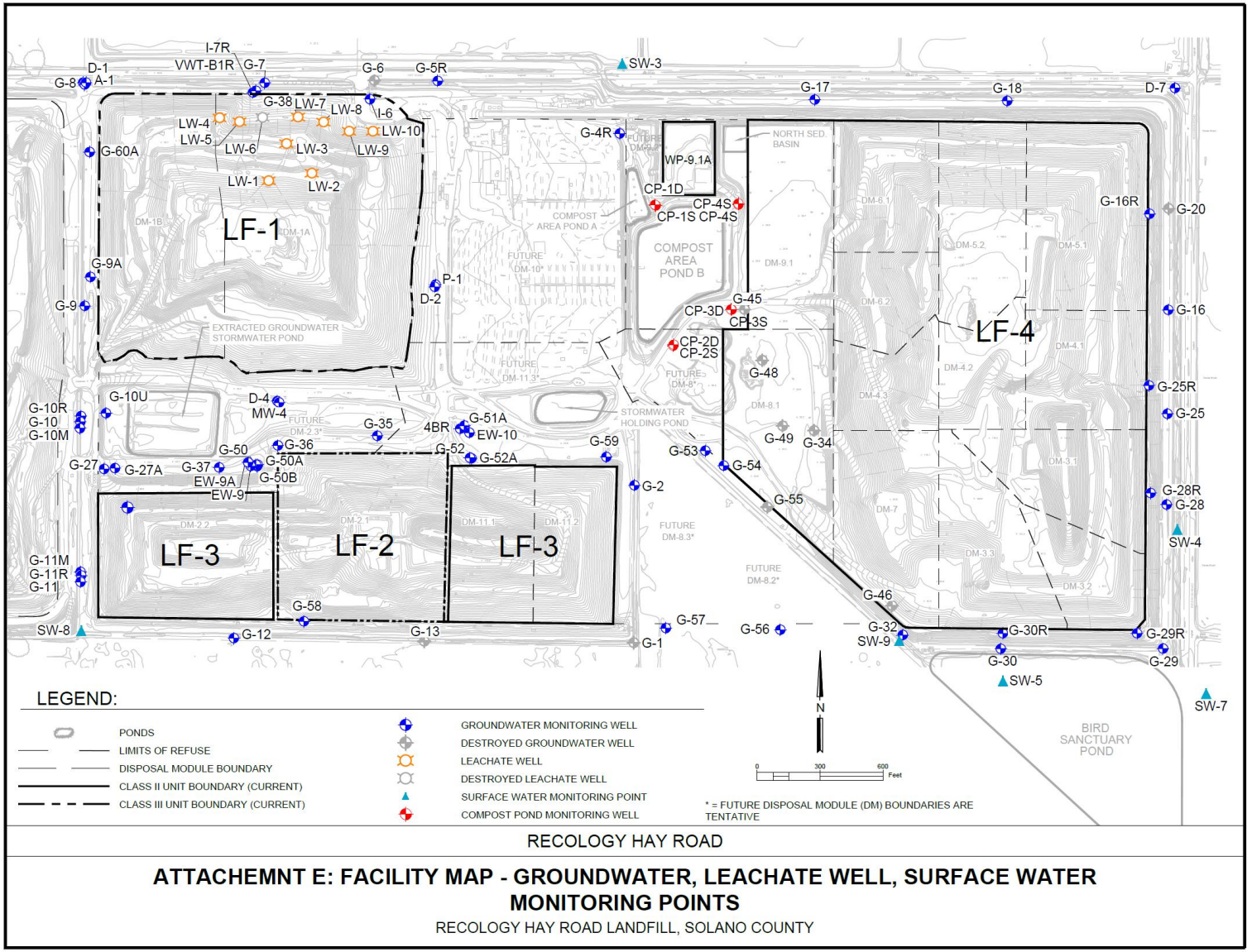
RECOLOGY HAY ROAD

ATTACHMENT D - AREA MAP

RECOLOGY HAY ROAD LANDFILL, SOLANO COUNTY

SECTION 2, T5N, R1E, MDB&M

ATTACHMENT E: FACILITY MAP

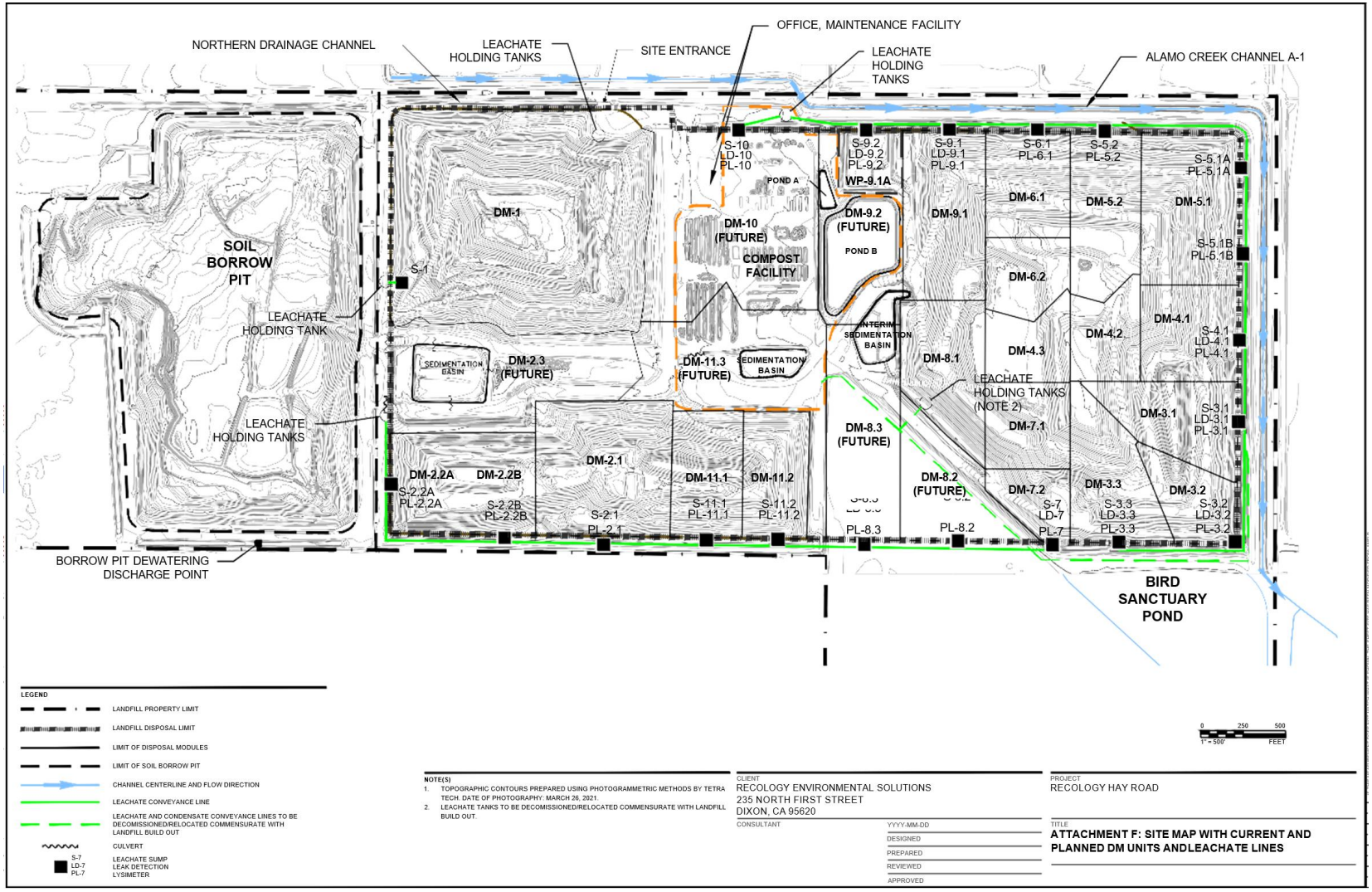


RECOLOGY HAY ROAD

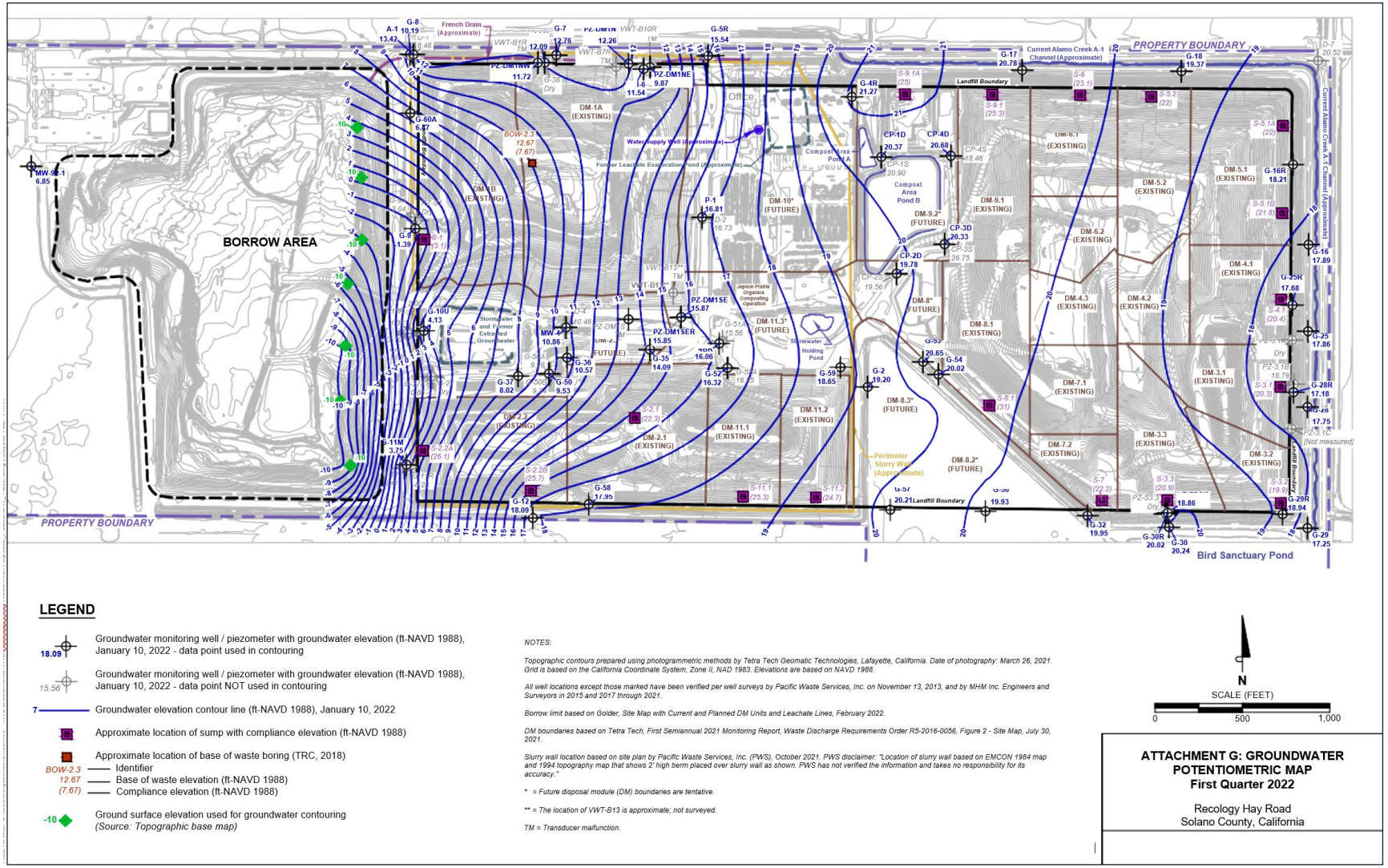
ATTACHEMNT E: FACILITY MAP - GROUNDWATER, LEACHATE WELL, SURFACE WATER MONITORING POINTS

RECOLOGY HAY ROAD LANDFILL, SOLANO COUNTY

ATTACHMENT F: CURRENT AND PLANNED UNITS WITH LEACHATE MANAGEMENT FEATURES MAP



ATTACHMENT G: POTENTIOMETRIC SURFACE MAP, 1ST QUARTER 2022



LEGEND

- Groundwater monitoring well / piezometer with groundwater elevation (ft-NAVD 1988), January 10, 2022 - data point used in contouring (e.g., 18.09)
- Groundwater monitoring well / piezometer with groundwater elevation (ft-NAVD 1988), January 10, 2022 - data point NOT used in contouring (e.g., 15.56)
- Groundwater elevation contour line (ft-NAVD 1988), January 10, 2022 (e.g., 7)
- Approximate location of sump with compliance elevation (ft-NAVD 1988)
- Approximate location of base of waste boring (TRC, 2018)
  - BOW-2.3 — Identifier
  - 12.67 — Base of waste elevation (ft-NAVD 1988)
  - (7.67) — Compliance elevation (ft-NAVD 1988)
- -10 — Ground surface elevation used for groundwater contouring (Source: Topographic base map)

NOTES:

Topographic contours prepared using photogrammetric methods by Tetra Tech Geomatic Technologies, Lafayette, California. Date of photography: March 26, 2021. Grid is based on the California Coordinate System, Zone II, NAD 1983. Elevations are based on NAVD 1988.

All well locations except those marked have been verified per well surveys by Pacific Waste Services, Inc. on November 13, 2013, and by MHM Inc. Engineers and Surveyors in 2015 and 2017 through 2021.

Borrow limit based on Golder, Site Map with Current and Planned DM Units and Leachate Lines, February 2022.

DM boundaries based on Tetra Tech, First Semiannual 2021 Monitoring Report, Waste Discharge Requirements Order R5-2016-0056, Figure 2 - Site Map, July 30, 2021.

Slurry wall location based on site plan by Pacific Waste Services, Inc. (PWS), October 2021. PWS disclaimer: "Location of slurry wall based on EMCON 1984 map and 1994 topography map that shows 2' high berm placed over slurry wall as shown. PWS has not verified the information and takes no responsibility for its accuracy."

** = Future disposal module (DM) boundaries are tentative.*

*** = The location of VWT-B13 is approximate; not surveyed.*

TM = Transducer malfunction.

N

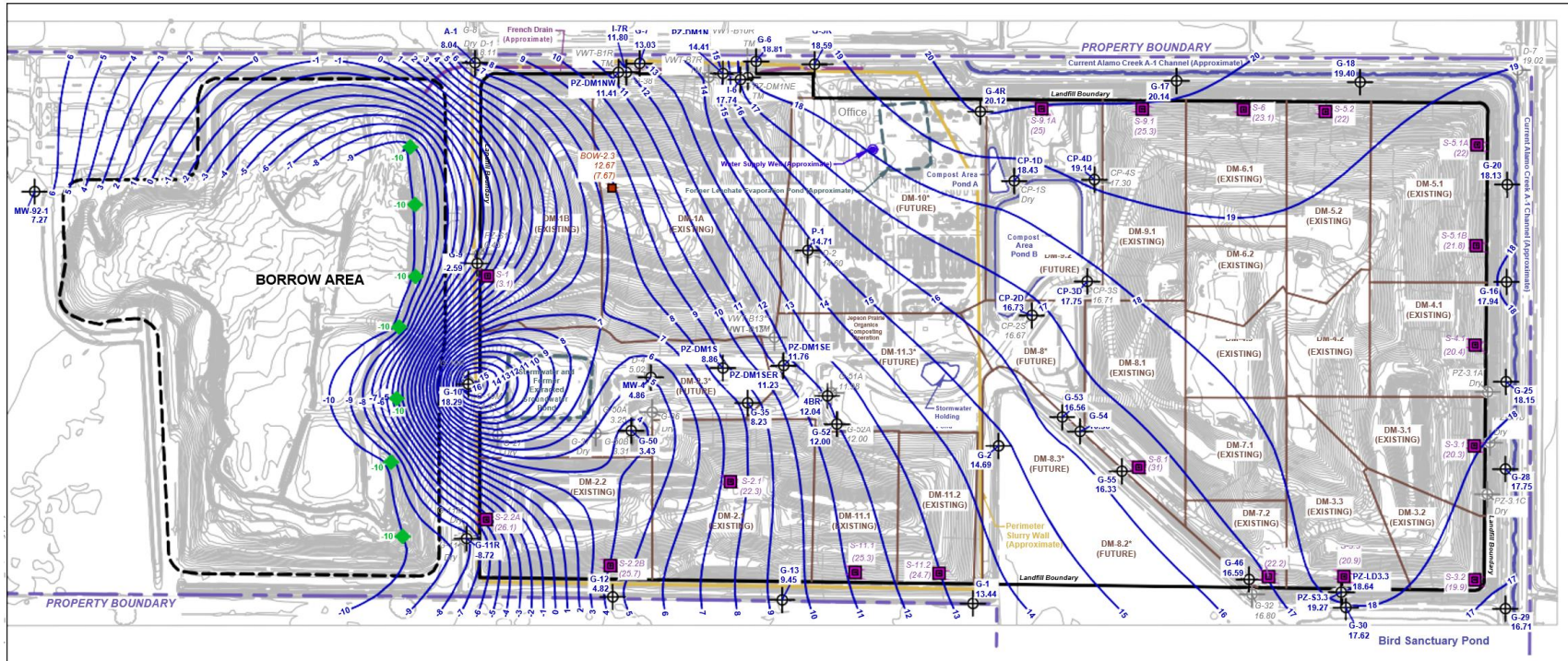
SCALE (FEET)

0 500 1,000

ATTACHMENT G: GROUNDWATER POTENTIOMETRIC MAP
First Quarter 2022

Recology Hay Road
Solano County, California

ATTACHMENT H: POTENTIOMETRIC SURFACE MAP, 3RD QUARTER 2021



LEGEND

- 12.04 — Groundwater monitoring well / piezometer with groundwater elevation (ft-NAVD 1988), July 26, 2021 - data point used in contouring
- 16.67 — Groundwater monitoring well / piezometer with groundwater elevation (ft-NAVD 1988), July 26, 2021 - data point NOT used in contouring
- 7 — Groundwater elevation contour line (ft-NAVD 1988), July 26, 2021
- Approximate location of sump with compliance elevation (ft-NAVD 1988)
- Approximate location of base of waste boring (TRC, 2018)
- BOW-2.3 — Identifier; 12.67 — Base of waste elevation (ft-NAVD 1988); (7.67) — Compliance elevation (ft-NAVD 1988)
- -10 — Ground surface elevation used for groundwater contouring (Source: Topographic base map)

NOTES:

Topographic contours prepared using photogrammetric methods by Tetra Tech Geomatic Technologies, Lafayette, California. Date of photography: March 26, 2021. Grid is based on the California Coordinate System, Zone II, NAD 1983. Elevations are based on NAVD 1988.

All well locations except those marked have been verified per well surveys by Pacific Waste Services, Inc. on November 13, 2013, and by MHM Inc. Engineers and Surveyors in 2015 and 2017 through 2021.

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Slurry wall location based on site plan by Pacific Waste Services, Inc. (PWS), October 2021. PWS disclaimer: "Location of slurry wall based on EMCON 1984 map and 1994 topography map that shows 2' high berm placed over slurry wall as shown. PWS has not verified the information and takes no responsibility for its accuracy."

** = Future disposal module (DM) boundaries are tentative.*

*** = The location of VWT-B13 is approximate; not surveyed.*

**** = The casing on well G-32 was raised and groundwater data will be excluded until the well is re-surveyed.*

TM = Transducer malfunction.

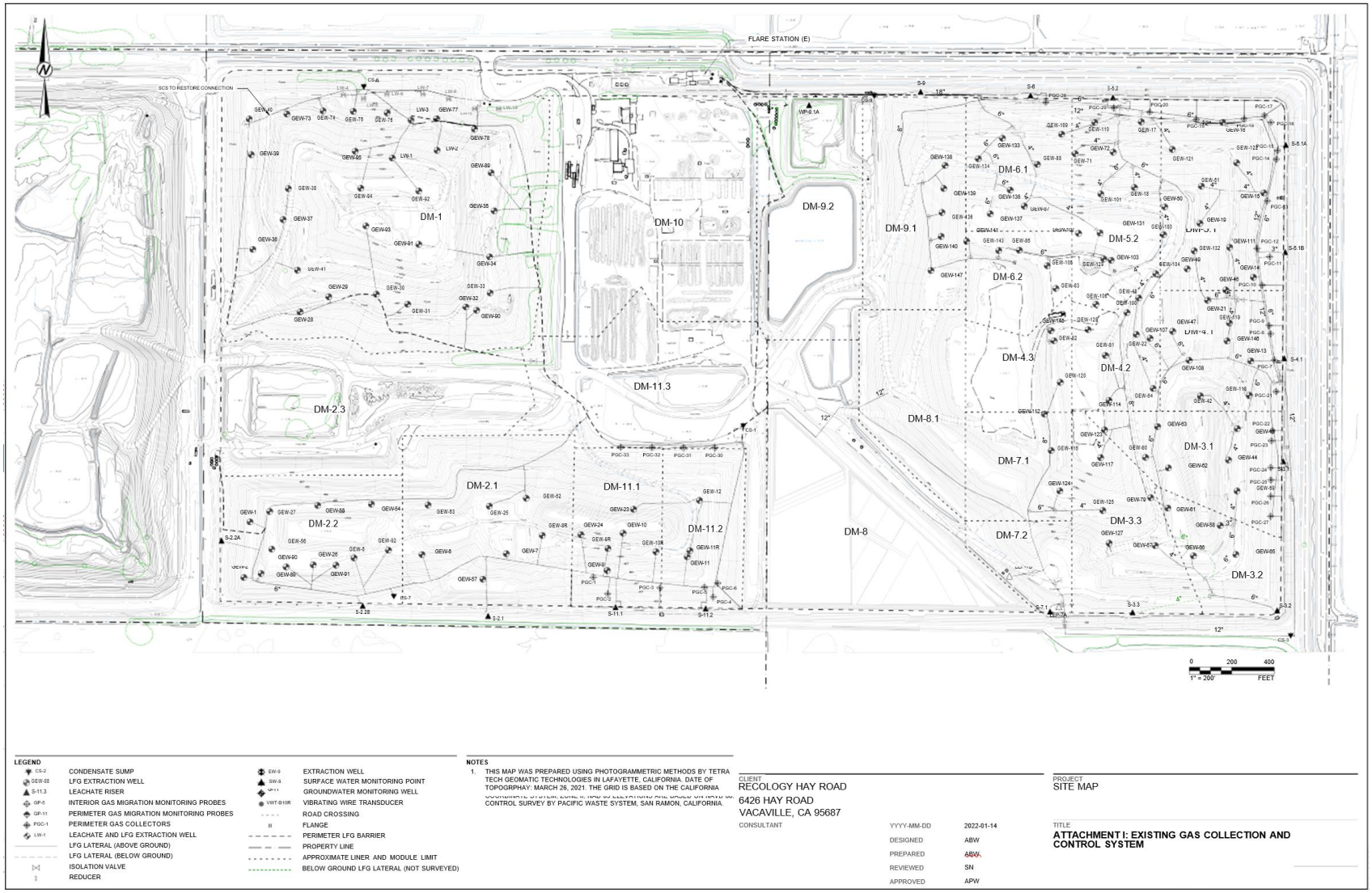
N

SCALE (FEET)
0 500 1,000

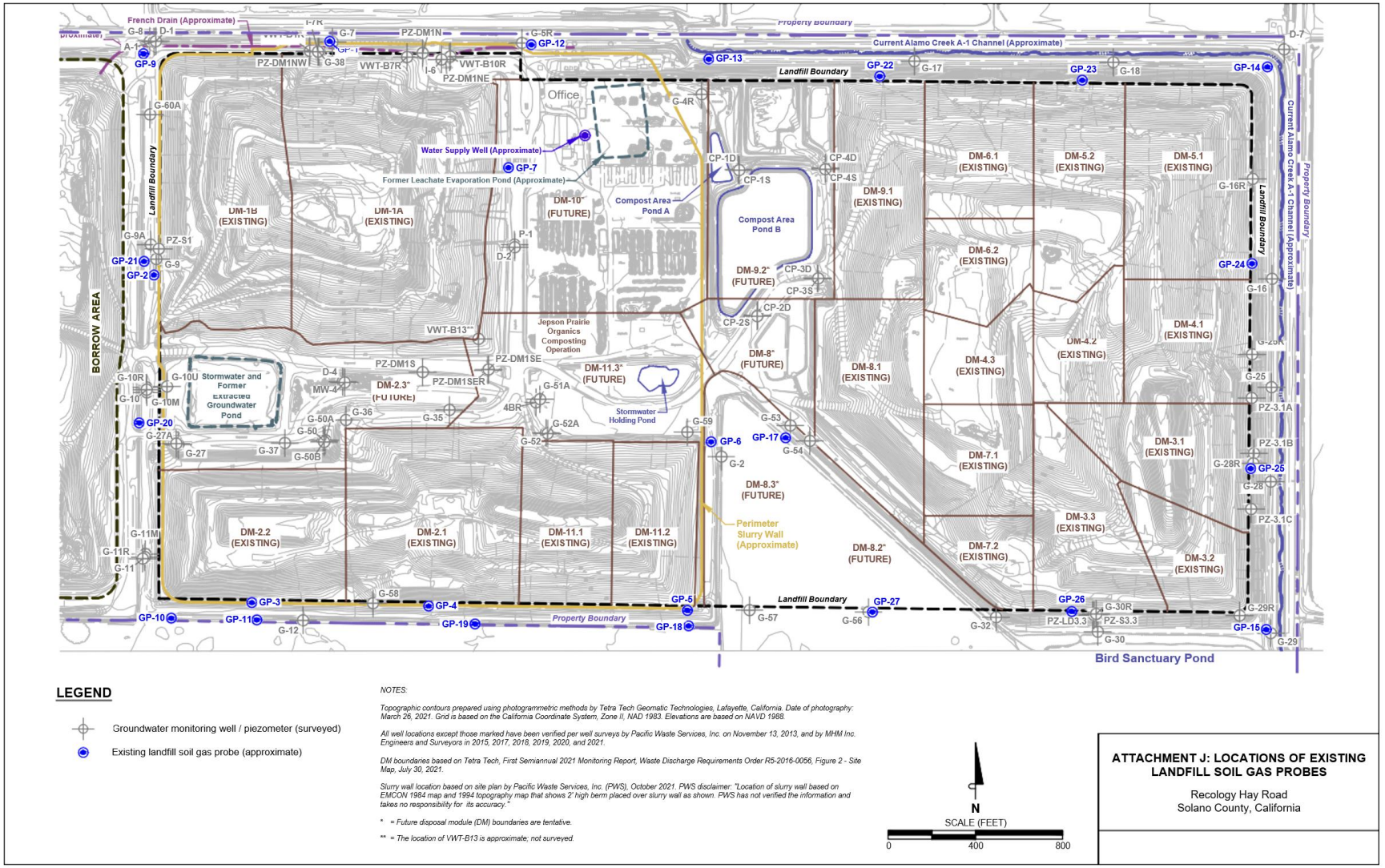
ATTACHMENT H: GROUNDWATER POTENTIOMETRIC MAP
Third Quarter 2021

Recology Hay Road
Solano County, California

ATTACHMENT I: LANDFILL GAS COLLECTION AND CONTROL SYSTEMS MAP



ATTACHMENT J: LANDFILL SOIL GAS PROBES MAP



LEGEND

- Groundwater monitoring well / piezometer (surveyed)
- Existing landfill soil gas probe (approximate)

NOTES:

Topographic contours prepared using photogrammetric methods by Tetra Tech Geomatic Technologies, Lafayette, California. Date of photography: March 26, 2021. Grid is based on the California Coordinate System, Zone II, NAD 1983. Elevations are based on NAVD 1988.

All well locations except those marked have been verified per well surveys by Pacific Waste Services, Inc. on November 13, 2013, and by MHM Inc. Engineers and Surveyors in 2015, 2017, 2018, 2019, 2020, and 2021.

DM boundaries based on Tetra Tech, First Semiannual 2021 Monitoring Report, Waste Discharge Requirements Order R5-2016-0056, Figure 2 - Site Map, July 30, 2021.

Slurry wall location based on site plan by Pacific Waste Services, Inc. (PWS), October 2021. PWS disclaimer: "Location of slurry wall based on EMCON 1984 map and 1994 topography map that shows 2' high berm placed over slurry wall as shown. PWS has not verified the information and takes no responsibility for its accuracy."

** = Future disposal module (DM) boundaries are tentative.*

*** = The location of VWT-B13 is approximate; not surveyed.*

N

SCALE (FEET)

0 400 800

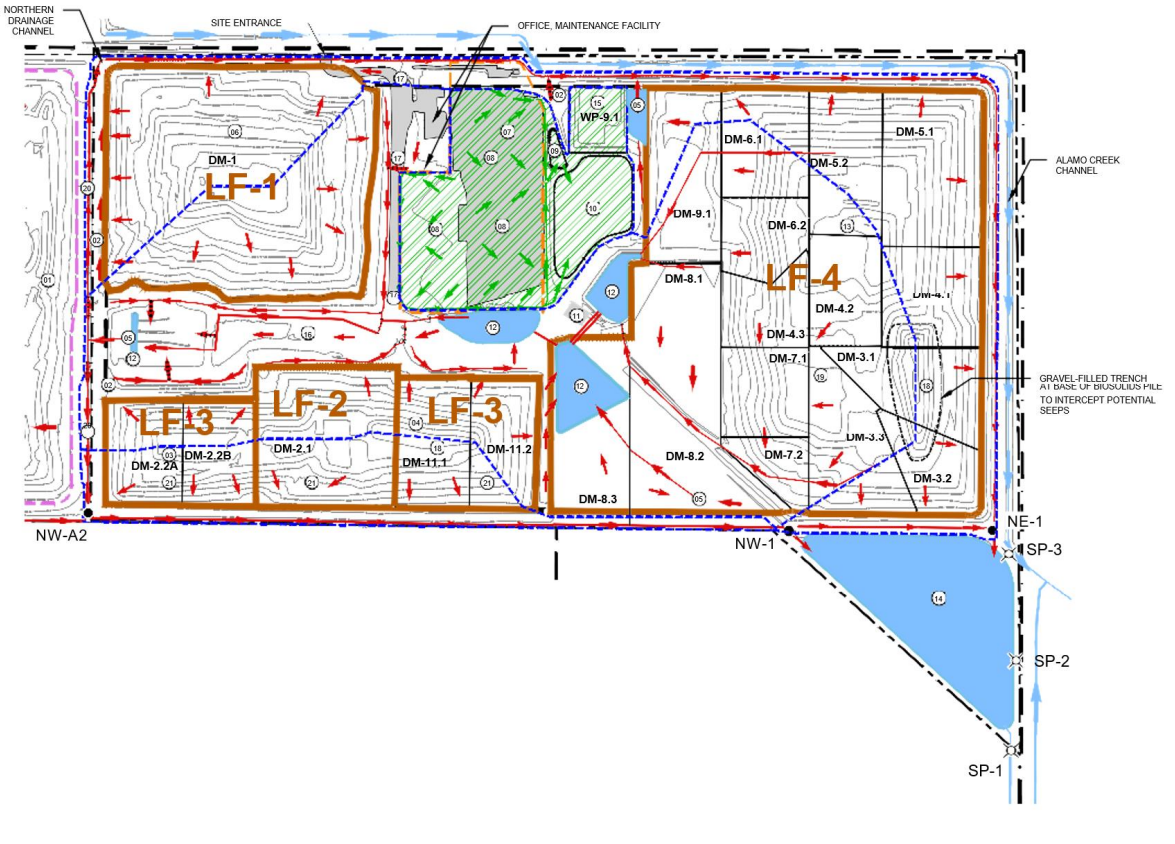
ATTACHMENT J: LOCATIONS OF EXISTING LANDFILL SOIL GAS PROBES

Recology Hay Road
Solano County, California

ATTACHMENT K: STORMWATER CONTROLS MAP

SITE MAP - PLAN VIEW

SCALE: 1" = 600'-0"



LEGEND

- LANDFILL PROPERTY LIMIT
- PERMITTED LANDFILL FOOTPRINT
- APPROXIMATE FACILITY BOUNDARY
- LIMIT OF DISPOSAL MODULES
- LIMIT OF SOIL BORROW PIT
- APPROXIMATE LIMIT OF EXISTING COMPOST PAD
- A-1 CHANNEL AND STREAM FLOW DIRECTION
- SITE STORMWATER FLOW DIRECTION
- DRAINAGE FLOW DIRECTION ON COMPOST PAD
- EARTHEN BERM
- DRAINAGE AREA BOUNDARY
- CULVERT
- STORMWATER MONITORING LOCATION
- BIRD SANCTUARY POND DISCHARGE LOCATION
- PAVED SURFACE
- COMPOST RUN-OFF
- LANDFILL UNIT BOUNDARY

01 SOIL BORROW PIT
02 LEACHATE TANKS
03 CLASS II SOIL STOCKPILE
04 INACTIVE LANDFILL PARCEL
05 PUMP
06 ASBESTOS WASTE DISPOSAL AREA
07 FINISHED COMPOST STORAGE AREA
08 COMPOST PROCESS AREA
09 COMPOST POND A
10 COMPOST POND B
11 APPLIANCE AND SCRAP METAL PROCESSING
12 SEDIMENTATION BASIN
13 ACTIVE LANDFILL PARCEL
14 BIRD SANCTUARY POND
15 BIOSOLIDS WASTE PILE
16 ROLL-OFF BIN STORAGE
17 RUMBLE STRIPS
18 BIOSOLIDS STOCKPILE
19 BIOSOLIDS DRYING AREA
20 WESTERN PERIMETER DITCH
21 INACTIVE VEGETATED SLOPES

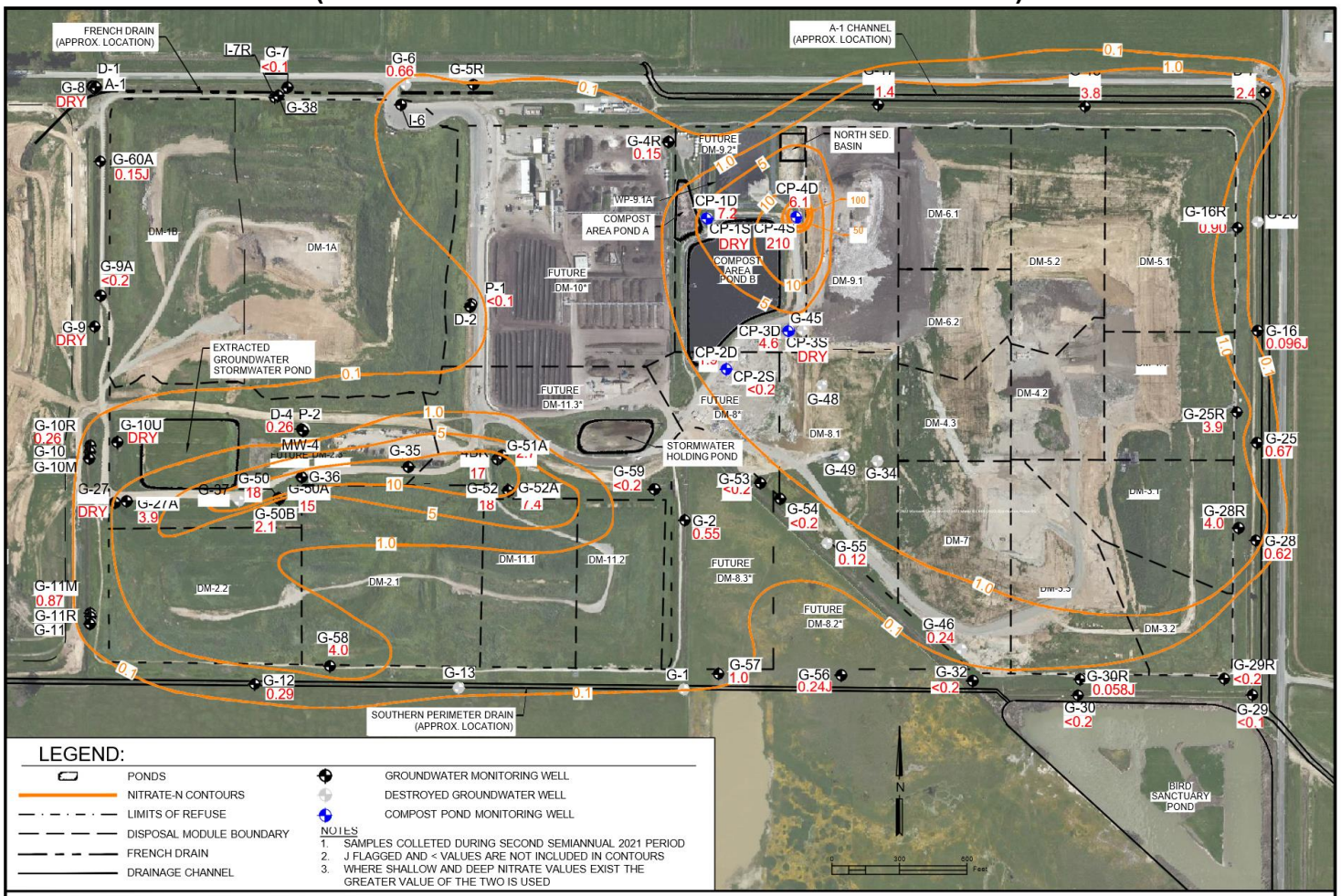
NOTES

1. TOPOGRAPHIC CONTOURS PREPARED USING PHOTOGRAMMETRIC METHODS BY TETRA TECH GEOMATIC TECHNOLOGIES. DATE OF PHOTOGRAPHY: SEPTEMBER 30, 2019.
2. MONITORING LOCATION NW-A2 REPRESENTS AN ALTERNATIVE DISCHARGE LOCATION FOR NW-1 WHEN THERE IS INDUSTRIAL STORMWATER FLOWING SOUTH FROM THE WESTERN PERIMETER DITCH.
3. FIGURE BASEMAP PROVIDED BY FARALLON CONSULTING, L.L.C., DATED DECEMBER 2019; AND GSI ENVIRONMENTAL DATED JANUARY 2022.
4. THE WESTERN PERIMETER DITCH IS PERIODICALLY MODIFIED TO SWITCH FLOW FROM NORTH TO SOUTH DEPENDING ON THE NEED FOR WATER AND GROUNDWATER IMPACTS.

Issued:	31-Jan-2022	Drawn By:	BMV
Revised:	--	Chkd By:	MAH
Scale:	SCALE AS SHOWN	Appvd By:	MAH
		FIGURE 1	

ATTACHMENT K: STORMWATER CONTROLS

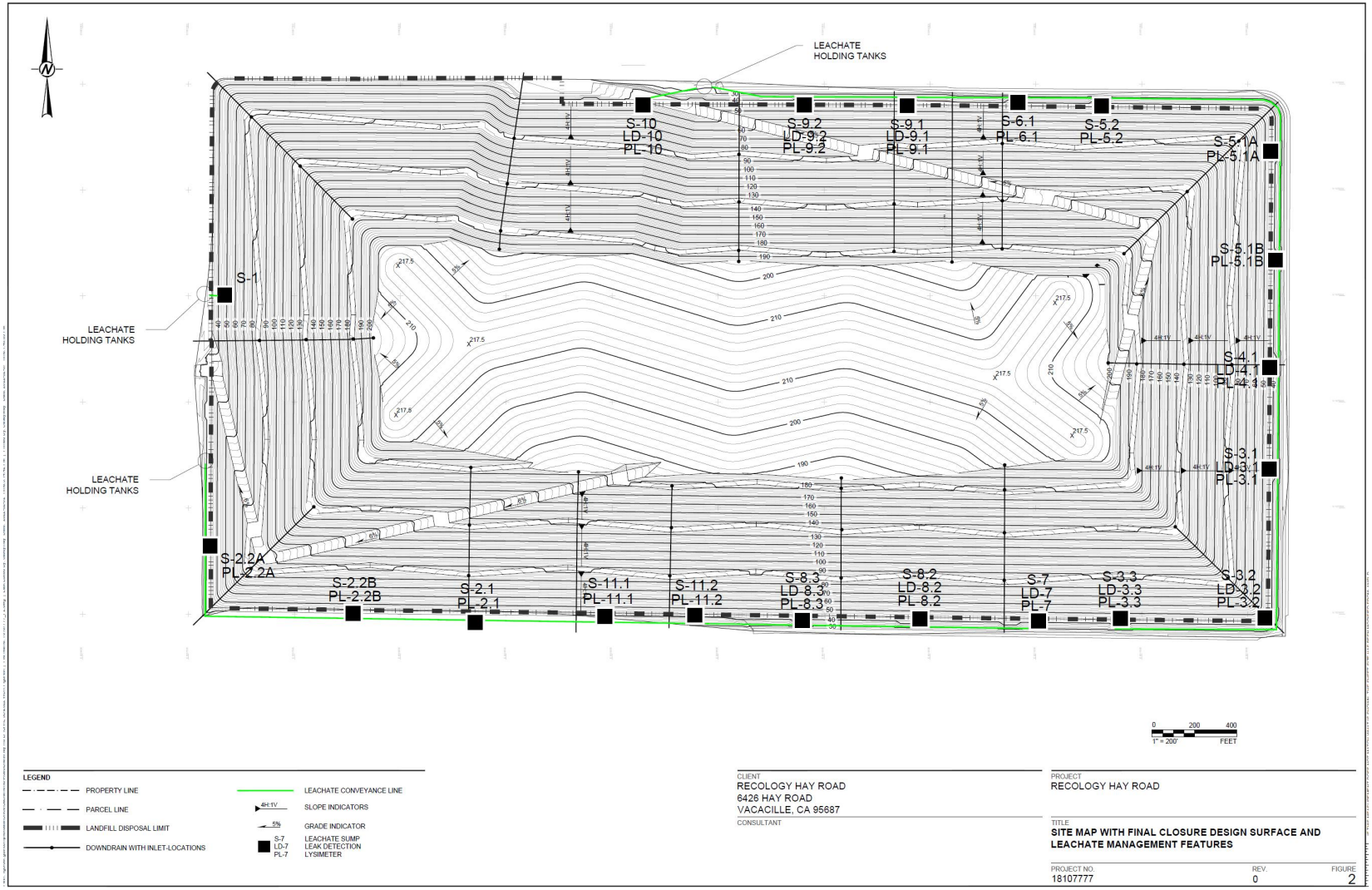
ATTACHMENT L: NITRATE AS N PLUME MAP
(DATA FROM SECOND SEMIANNUAL 2021 EVENT)



RECOLOGY HAY ROAD

ATTACHMENT L - NITRATE-N PLUME MAP
(mg/L)
RECOLOGY HAY ROAD LANDFILL, SOLANO COUNTY

ATTACHMENT M:FINAL CLOSURE DESIGN AND LEACHATE MANAGEMENT FEATURES



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

STANDARD PROVISIONS & REPORTING REQUIREMENTS

FOR

WASTE DISCHARGE REQUIREMENTS
FOR

INDUSTRIAL FACILITIES REGULATED BY TITLE 27

(Title 27, § 20005 et seq.)

April 2016

TABLE OF CONTENTS

STANDARD PROVISIONS & REPORTING REQUIREMENTS

A. APPLICABILITY

1. These Standard Provisions and Reporting Requirements (SPRRs) are applicable to Class II surface impoundments, waste piles, and land treatment units that are regulated by the Central Valley Regional Water Quality Control Board (hereafter, Central Valley Water Board) pursuant to the provisions of California Code of Regulations, title 27 ("Title 27"), section 20005 et seq.

2. "Order," as used throughout this document, means the Waste Discharge Requirements (WDRs) to which these SPRRs are incorporated.

3. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, and do not protect the Discharger from liabilities under federal, state, or local laws. This Order does not convey any property rights or exclusive privileges.

4. The provisions of this Order are severable. If any provision of this Order is held invalid, the remainder of this Order shall not be affected.

5. If there is any conflicting or contradictory language between the WDRs, the Monitoring and Reporting Program (MRP), or the SPRRs, then language in the WDRs shall govern over either the MRP or the SPRRs, and language in the MRP shall govern over the SPRRs.

6. If there is a site-specific need to change a requirement in these SPRRs for a particular facility, the altered requirement shall be placed in the appropriate section of the WDRs and will supersede the corresponding SPRRs requirement. These SPRRs are standard and cannot be changed as part of the permit writing process or in response to comments, but they will be periodically updated on an as-needed basis.

7. Unless otherwise stated, all terms are as defined in Water Code section 13050 and in Title 27, section 20164.

B. TERMS AND CONDITIONS

1. Failure to comply with any waste discharge requirement, monitoring and reporting requirement, or Standard Provisions and Reporting Requirement, or other order or prohibition issued, reissued, or amended by the Central Valley Water Board or the State Water Board, or intentionally or negligently discharging waste, or causing or permitting waste to be deposited where it is discharged into the waters of the state and creates a condition of pollution or nuisance, is a violation of this Order and the Water Code, which can result in the imposition of civil monetary liability [Wat. Code, § 13350(a)]

2. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to [Wat. Code, § 13381]:

a. Violation of any term or condition contained in this Order;

b. Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts;

c. A change in any condition that results in either a temporary or permanent need to reduce or eliminate the authorized discharge; or

d. A material change in the character, location, or volume of discharge.

3. Before initiating a new discharge or making a material change in the character, location, or volume of an existing discharge, the Discharger shall file a new report of waste discharge (ROWD), or other appropriate joint technical document (JTD), with the Central Valley Water Board [Wat. Code, § 13260(c) and § 13264(a)]. A material change includes, but is not limited to, the following:

   a. An increase in area or depth to be used for solid waste disposal beyond that specified in waste discharge requirements;

   b. A significant change in disposal method, location, or volume (e.g., change from land disposal to land treatment);

   c. A change in the type of waste being accepted for disposal; or

   d. A change to previously-approved liner systems or final cover systems that would eliminate components or reduce the engineering properties of components.

4. Representatives of the Central Valley Water Board may inspect the facilities to ascertain compliance with the waste discharge requirements. The inspection shall be made with the consent of the owner or possessor of the facilities or, if the consent is refused, with a duly issued warrant. However, in the event of an emergency affecting the public health or safety, an inspection may be made without consent or the issuance of a warrant [Wat. Code, §13267(c)].

5. The Central Valley Water Board will review this Order periodically and will revise these waste discharge requirements when necessary [Wat. Code, § 13263(e) and Title 27, § 21720(b)].

6. Except for material determined to be confidential in accordance with California law and regulations, all reports prepared in accordance with terms of this Order shall be available for public inspection at the offices of the Central Valley Water Board [Wat. Code, § 13267(b)]. Data on waste discharges, water quality, geology, and hydrogeology shall not be considered confidential.

7. A discharge of waste into the waters of the state is a privilege, not a right. No discharge of waste into waters of the state, whether or not the discharge is made pursuant to waste discharge requirements, shall create a vested right tocontinue the discharge [Wat. Code, § 13263(g)].

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

C. STANDARD PROHIBITIONS

1. The discharge of wastes which have the potential to reduce or impair the integrity of containment structures or which, if commingled with other wastes in the waste management unit, could produce violent reaction, heat or pressure, fire or explosion, toxic by-products, or reaction products, which, in turn:

   a. require a higher level of containment than provided by the unit; or

   b. are ‘restricted wastes’; or

   c. impair the integrity of containment structures;

   is prohibited [Title 27, § 20200(b)].

2. The discharge of wastes outside of a waste management unit or portions of a unit specifically designed for their containment is prohibited.

3. The discharge of waste to a closed waste management unit is prohibited.

4. The discharge of waste constituents to the unsaturated zone or to groundwater is prohibited, except within the treatment zone at a land treatment unit.

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

D. STANDARD DISCHARGE SPECIFICATIONS

1. The Discharger is responsible for accurate characterization of wastes, including a determination of whether or not wastes will be compatible with containment features and other wastes at the waste management unit and whether or not the wastes are required to be managed as a hazardous waste [Title 27, § 20200(c)] or designated waste [Title 27, § 20210].

2. Leachate collected from a waste management unit shall be discharged to the unit from which it came, or discharged to an appropriate waste management unit in accordance with Title 27 and in a manner consistent with the waste classification of the liquid [Title 27, § 20200(d) and § 20340(g)].

3. Wastes shall be discharged only into waste management units specifically designed for their containment and/or treatment, as described in this Order.

4. The discharge shall remain within the designated disposal area at all times.

5. The discharge of waste shall not cause a nuisance condition [Wat. Code, § 13050(m)].

E. STANDARD FACILITY SPECIFICATIONS

1. All waste management units shall be designed, constructed, and operated to ensure that wastes, including leachate, will be a minimum of 5 feet above the highest anticipated elevation of underlying groundwater [Title 27, § 20240(c)], including the capillary fringe.

2. Surface and subsurface drainage from outside of a waste management unit shall be diverted from the unit [Title 27, § 20365(e)].

3. The Discharger shall **immediately** notify the Central Valley Water Board staff of any slope failure occurring at a waste management unit. Any failure which threatens the integrity of containment features or the waste management unit shall be promptly corrected in accordance with an approved method [Title 27, § 21710(c)(2)].

4. The Discharger shall **immediately** notify Central Valley Water Board staff of any flooding, unpermitted discharge of waste off-site or outside of waste management units, equipment failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.
5. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.

6. The Discharger shall lock all groundwater monitoring wells with a lock on the well cap or monitoring well box. All monitoring devices shall be clearly labeled with their designation including all monitoring wells, LCRS risers, and lysimeter risers and shall be easily accessible for required monitoring by authorized personnel. Each monitoring device shall be clearly visible and be protected from damage by equipment or vehicles.

7. The Discharger shall maintain the depth of the fluid in the sump of each waste management unit at the minimum needed for efficient pump operation (the depth at which the pump turns on given the pump intake height and maximum pump cycle frequency).

8. Each LCRS shall be tested at least annually to demonstrate proper operation. The results of the tests shall be compared with earlier tests made under comparable conditions [Title 27, § 20340(d)].

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

F. STANDARD CONSTRUCTION SPECIFICATIONS

1. The Discharger shall submit for review and approval at least **90 days** prior to proposed construction, design plans and specifications for new Class II waste management units that include the following:

   a. Detailed construction drawings showing all required liner system components, the LCRS, leachate sump, unsaturated zone monitoring system, and access to the LCRS for required annual testing.

   b. A Construction Quality Assurance (CQA) Plan prepared by a California-registered civil engineer or certified engineering geologist, and that meets the requirements of Title 27, section 20324.

   c. A geotechnical evaluation of the area soils, evaluating their use as the base layer or reference to the location of this information in the ROWD/JTD [Title 27, § 21750(f)(4)].

   d. Information about the seismic design of the proposed new waste management unit (or reference to the location of this information in the ROWD/JTD) in accordance with Title 27, section 20370.

   e. A revised water quality monitoring plan for groundwater detection monitoring (or information showing the existing plan is adequate) in accordance with Title 27, section 20415.

   f. An Operation Plan (or reference to the location of this information in the ROWD/JTD) meeting the requirements of Title 27, sections 21760(b) and 20375(b).

2. All containment structures shall be designed by, and construction shall be supervised by, a California registered civil engineer or a certified engineering geologist, and shall be certified by that individual as meeting the prescriptive standards, or approved engineered alternative design, in accordance with this Order prior to waste discharge.

3. The Discharger shall not proceed with construction until the construction plans, specifications, and all applicable construction quality assurance plans have been approved. Waste management units shall receive a final inspection and approval of the construction by Central Valley Water Board staff before use of

the unit commences [Title 27, § 20310(e)].

4. Any report, or any amendment or revision of a report, that proposes a design or design change that might affect a waste management unit's containment features or monitoring systems shall be approved by a California registered civil engineer or a certified engineering geologist [Title 27, § 21710(d)].

5. Materials used in containment structures shall have appropriate chemical and physical properties to ensure that such structures do not fail to contain waste because of pressure gradients, physical contact with waste or leachate, chemical reactions with soil or rock, climatic conditions, the stress of installation, or because of the stress of daily operations [Title 27, § 20320(a)].

6. Waste management units and their respective containment structures shall be designed and constructed to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping [Title 27, § 20365(a)].

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

8. All Class II waste management units shall be designed to withstand maximum credible earthquake without damage to the foundation or to the structures that control leachate, or surface drainage, or erosion [Title 27, § 20370(a)].

9. The Discharger shall perform stability analyses that include components to demonstrate the integrity of the waste management unit foundation, final slopes, and containment systems under both static and dynamic conditions throughout the life of the unit [Title 27, § 21750(f)(5)].

10. New Class II Units, other than LTUs and expansions of existing Class II units, shall have a 200 foot setback from any known Holocene fault. [Title 27, § 20250(d)].

11. Liners shall be designed and constructed to contain the fluid, including waste, and leachate [Title 27, § 20330(a)].

12. Hydraulic conductivities shall be determined primarily by appropriate field test methods in accordance with accepted civil engineering practice. The results of laboratory tests with both water and leachate, and field tests with water, shall be compared to evaluate how the field permeabilities will be affected by leachate. It is acceptable for the Discharger to use appropriate compaction tests in conjunction with laboratory hydraulic conductivity tests to determine field permeabilities as long as a reasonable number of field hydraulic conductivity tests are also conducted [Title 27, § 20320(c)].

13. Hydraulic conductivities specified for containment structures other than the final cover shall be relative to the fluids (leachate) to be contained. Hydraulic conductivities for the final cover shall be relative to water [Title 27, § 20320(b)].

14. A test pad for each barrier layer and any final cover shall be constructed in a manner duplicating the field construction. Test pad construction methods, with the designated equipment, shall be used to determine if the specified density/moisture-content/hydraulic conductivity relationships determined in the laboratory can be achieved in the field with the compaction equipment to be used and at the specified lift thickness [Title 27, § 20324(g)(1)(A)].

15. The Discharger shall ensure proper preparation of the subgrade for any liner system that includes a GCL so as to provide a smooth surface that is free from rocks, sticks, or other debris that could damage or otherwise limit the performance of the GCL.

16. The Discharger shall propose an electronic leak location survey of the top liner for any new waste management unit in the construction quality assurance plan unless the Discharger demonstrates that a leak location survey is not needed.

17. Leachate collection and removal systems are required for Class II surface impoundments [Title 27, § 20340(a)].

18. The LCRS shall be designed, constructed, maintained, and operated to collect and remove twice the maximum anticipated daily volume of leachate from the waste management unit [Title 27, § 20340(b)].

19. Leachate collection and removal systems shall be designed and operated to function without clogging through the life of the waste management unit.

20. The leachate sump, leachate removal pump, and pump controls shall be designed and set to maintain a fluid depth no greater than the minimum needed for efficient pump operation [Title 27, § 20340(c)].

21. All construction of liner systems and final cover systems shall be performed in accordance with a Construction Quality Assurance Plan certified by a registered civil engineer or a certified engineering geologist [Title 27, § 20323].

22. The Construction Quality Assurance program shall be supervised by a registered civil engineer or a certified engineering geologist who shall be designated the CQA officer [Title 27, § 20324(b)(2)].

23. The Discharger shall ensure that a third party independent of both the Discharger and the construction contractor performs all of the construction quality assurance monitoring and testing during the construction of a liner system.

24. The Discharger shall notify Central Valley Water Board staff at least **14 days** prior to commencing field construction activities including construction of a new Class II waste management unit, construction of a final cover (for units closed as a landfill), or any other construction that requires Central Valley Water Board staff approval under this Order.

25. The Discharger shall submit for review and approval at least **60 days** prior to proposed discharge, final documentation required in Title 27 Section 20324(d)(1)(C) following the completion of construction of a new Class II waste management unit. The report shall be certified by a registered civil engineer or a certified engineering geologist and include a statement that the liner system was constructed in accordance with the approved design plans and specifications, the CQA Plan, the requirements of the WDRs, and that it meets the performance goals of Title 27. The report shall contain sufficient information and test results to verify that construction was in accordance with the design plans and specifications, the construction quality assurance plan, and the performance goals of Title 27.

26. The Discharger shall not discharge waste onto a newly constructed liner system until the final documentation report has been reviewed and an acceptance letter has been received.

G. STANDARD CLOSURE AND POST-CLOSURE SPECIFICATIONS

1. The final closure and post-closure maintenance plan for the waste management unit shall include at least the following: an itemized cost analysis, closure schedule, any proposed final treatment procedures, map, changes to the unit description presented in the most recent ROWD, future land use, and a construction quality assurance plan [Title 27, § 21769(c) & (d)].

2. Closure of each waste management unit shall be under the direct supervision of a registered civil engineer or certified engineering geologist [Title 27, § 20950(b)].

3. The final cover of waste management units closed as a landfill shall be designed, graded, and maintained to prevent ponding and soil erosion due to high run-off velocities [Title 27, § 21090(b)(1)(A)].

4. The final grading design shall be designed and approved by a registered civil engineer or certified engineering geologist [Title 27, § 21090(b)(1)(C)].

5. All final cover designs shall include a minimum 1-foot thick erosion resistant vegetative layer or a mechanically erosion-resistant layer [Title 27, § 21090(a)(3)(A)(1 & 2)].

6. Areas with slopes greater than ten percent, surface drainage courses, and areas subject to erosion by wind or water shall be designed and constructed to prevent such erosion [Title 27, § 21090(b)(2)].

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

8. Construction or repair of a final cover system's low-hydraulic conductivity layer is to be carried out in accordance with an approved construction quality assurance plan [Title 27, § 21090(b)(1)(E)].

9. Within **30 days** of completion of all closure activities, the Discharger shall certify that all closure activities were performed in accordance with the most recently approved final closure plan and CQA Plan, and in accordance with all applicable regulations. The Discharger shall also certify that units that are closed as a landfill shall be maintained in accordance with an approved post-closure maintenance plan [Title 27, § 21710(c)(6)].

10. The post-closure maintenance period for units closed as a landfill shall continue until the Central Valley Water Board determines that wastes remaining in the landfill unit(s) no longer pose a threat to water quality [Title 27, § 20950(a)(1)].

11. The Discharger shall periodically inspect and identify problems with the final cover including areas that require replanting, erosion, areas lacking free drainage, and any areas damaged by equipment operations [Title 27, § 21090(a)(4)(B)].

12. The Discharger shall repair any cover promptly in accordance with a cover repair plan to be included in the final post-closure maintenance plan [Title 27, § 21090(a)(4)(C)].

H. STANDARD FINANCIAL ASSURANCE PROVISIONS

1. The Discharger shall establish an irrevocable fund (or provide other means) for closure to ensure closure of each Class II unit in accordance with an approved closure plan [Title 27, § 20950(f) and § 22207(a)].

2. The Discharger shall obtain and maintain assurances of financial responsibility for initiating and completing corrective action for all known and reasonably foreseeable releases from the waste management unit [Title 27, §20380(b) and § 22222].

I. STANDARD MONITORING SPECIFICATIONS

1. The water quality monitoring program shall include appropriate and consistent sampling and analytical procedures and methods designed to ensure that monitoring results provide a reliable indication of water quality at all monitoring points and background monitoring points [Title 27, § 20415(e)(4)].

2. All monitoring systems shall be designed and certified by a registered geologist or a registered civil engineer [Title 27, § 20415(e)(1)].

3. All monitoring wells shall be cased and constructed in a manner that maintains the integrity of the monitoring well bore hole and prevents the bore hole from acting as a conduit for contaminant transport [Title 27, § 20415(b)(4)(A)].

4. All sample chemical analyses of any material shall be performed by a laboratory certified by the California Department of Health Services [Wat. Code, § 13176(a)].

5. A Detection Monitoring Program for a new Class II waste management unit shall be installed, operational, and one year of monitoring data collected from background monitoring points prior to the discharge of wastes [Title 27, § 20415(e)(6)].

6. Background for water samples shall be represented by the data from all samples taken from applicable background monitoring points during that reporting period (at least one sample from each background monitoring point).

7. The Discharger shall submit for approval, establish, and maintain an approved Sample Collection and Analysis Plan. The Sample Collection and Analysis Plan shall at a minimum include:

    a. Sample collection procedures describing purging techniques, sampling equipment, and decontamination of sampling equipment;

    b. Sample preservation information and shipment procedures;

    c. Sample analytical methods and procedures;

    d. Sample quality assurance/quality control (QA/QC) procedures;

    e. Chain of Custody control; and

    f. Sample analysis information including sample preparation techniques to avoid matrix interferences, method detection limits (MDLs), practical quantitation limits (PQLs) and reporting limits (RLs), and procedures for reporting trace results between the MDL and PQL.

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

8. For any given monitored medium, the samples taken from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be taken **within a span not to exceed 30 days**, unless a longer time period is approved, and shall be taken in a manner that ensures sample independence to the greatest extent feasible. Specific methods of collection and analysis must be identified. Sample collection, storage, and analysis shall be performed according to the most recent version of USEPA Methods, such as the latest editions, as applicable, of: (1) Methods for the Analysis of Organics in Water and Wastewater (USEPA 600 Series), (2) Test Methods for Evaluating Solid Waste (SW-846, latest edition), and (3) Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020), and in accordance with the approved Sample Collection and Analysis Plan. Appropriate sample preparation techniques shall be used to minimize matrix interferences.

9. If methods other than USEPA-approved methods or Standard Methods are used, or there is a proposed alternant USEPA method than the one listed in the MRP, the proposed methodology shall be submitted for review and approval prior to use, including information showing its equivalence to the required method.

10. The **methods of analysis and the detection limits** used must be appropriate for the expected concentrations. For the monitoring of any constituent or parameter that is found in concentrations which produce more than 90 percent non-numerical determinations (i.e., “trace” or “ND”) in data from background monitoring points for that medium, the analytical method having the lowest MDL shall be selected from among those methods which would provide valid results in light of any matrix effects or interferences.

11. The laboratory reporting limit (RL) for all reported monitoring data shall be set no greater than the practical quantitation limit (PQL).

12. **“Trace” results** - results falling between the MDL and the PQL - shall be reported as such, and shall be accompanied both by the estimated MDL and PQL values for that analytical run.

13. Laboratory data shall not be altered or revised by the Discharger. If the Discharger observes potential lab errors, it shall identify the issue in the monitoring report and shall describe steps that will be taken to prevent similar errors in the future.

14. **MDLs and PQLs** shall be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the lab, rather than simply being quoted from USEPA analytical method manuals. In relatively interference-free water, laboratory-derived MDLs and PQLs are expected to closely agree with published USEPA MDLs and PQLs. MDLs and PQLs shallbe reported.

15. If the laboratory suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged in the laboratory report accordingly, along with estimates of the detection limit and quantitation limit actually achieved. The **MDL shall always be calculated such that it represents the lowest achievable concentration associated with a 99 percent reliability of a nonzero result**. The PQL shall always be calculated such that it represents the lowest constituent concentration at which a numerical value can be assigned with reasonable certainty that it represents the constituent's actual concentration in the sample. Normally, PQLs should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.

16. All **QA/QC data** shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and signature of a responsible person from the laboratory. **Sample results shall be reported unadjusted for blank results or spike recoveries**. In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged, but the analytical results shall not be adjusted.

17. Unknown chromatographic peaks shall be reported, flagged, and tracked for potential comparison to subsequent unknown peaks that may be observed in future sampling events. Identification of unknown chromatographic peaks that recur in subsequent sampling events may be required.

18. The sampling interval of each monitoring well shall be appropriately screened and fitted with an appropriate filter pack to enable collection of representative groundwater samples [Title 27, § 20415(b)(4)(B)].

19. All borings are to be logged during drilling under the direct supervision of a registered geologist or registered civil engineer with expertise in stratigraphic well logging [Title 27, § 20415(e)(2)].

20. Soils are to be described according to the Unified Soil Classification System [Title 27, § 20415(e)(2)(A)]. Rock is to be described in a manner appropriate for the purpose of the investigation [Title 27, § 20415(e)(2)(B)].

21. The Discharger shall submit a work plan for review and approval at least **60 days** prior to installation or abandonment of groundwater monitoring wells.

22. The Discharger shall provide Central Valley Water Board staff a minimum of **one week** notification prior to commencing any field activities related to the installation or abandonment of monitoring devices.

23. The water quality protection standard shall consist of the constituents of concern (COC), concentration limits, and the point of compliance. The water quality protection standard shall apply during the active life of the waste management unit, closure period, post-closure maintenance period, and any compliance period under Title 27, section 20410 [Title 27, § 20390].

24. The point of compliance at which the water quality protection standard applies is a vertical surface located at the hydraulically downgradient limit of the waste management unit that extends through the uppermost aquifer underlying the unit [Title 27, § 20405).

25. The compliance period is the minimum period of time during which the Discharger shall conduct a water quality monitoring program and is the number of years equal to the active life of the waste management unit plus the closure period [Title 27, § 20410(a)].

26. The groundwater monitoring system shall include a sufficient number of monitoring points, installed at appropriate locations, to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater that has not been affected by a release from the waste management unit [Title 27, § 20415(b)(1)(A)].

27. The Detection Monitoring Program shall include a sufficient number of monitoring points, installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the point of compliance to allow the detection of a release from the waste management unit [Title 27, § 20415(b)(1)(B)1.].

28. Additional monitoring points shall be added as necessary to provide the best assurance of the **earliest possible detection** of a release from the waste management unit [Title 27, § 20415(b)(1)(B)2.].

29. The Detection Monitoring Program shall also include a sufficient number of monitoring points installed at appropriate depths and locations to yield groundwater samples from other aquifers or perched zones not already monitored to provide the **earliest possible detection** of a release from the waste management unit [Title 27, § 20415(b)(1)(B)3. and 4., and §20420(b)].

30. A surface water monitoring system shall be established to monitor each surface water body that could be affected by a release from the waste management unit [Title 27, § 20415(c)].

31. An unsaturated zone monitoring system shall be established for each waste management unit [Title 27, § 20415(d)].

32. The Discharger shall notify Central Valley Water Board staff within **seven days** if fluid is detected in a previously dry LCRS, unsaturated zone monitoring system, or if a progressive increase is detected in the volume of fluid in a LCRS [Title 27, § 21710(c)(3)].

33. Driller's logs for all monitoring wells shall to be submitted to the Central Valley Water Board and the Department of Water Resources [Wat. Code, § 13751 and Title 27, § 20415(b)(3)].

34. Groundwater elevation, temperature, electrical conductivity, turbidity, and pH are to be accurately measured at each well each time groundwater is sampled [Title 27, § 20415(e)(13)].

35. The groundwater flow rate and direction in the uppermost aquifer and in any zones of perched water and in any additional portions of the zone of saturation being monitored shall be determined at least quarterly [Title 27, § 20415(e)(15)].

36. The Discharger shall graph all analytical data from each monitoring point and background monitoring point and shall submit the graphs to the Central Valley Water Board annually [Title 27, § 20415(e)(14)].

37. For each waste management unit, the Discharger shall collect all data necessary for selecting appropriate data analysis methods for establishing background values for each constituent of concern and for each monitoring parameter [Title 27, § 20420(c)]. The Discharger shall propose a data analysis method that includes a detailed description of the criteria to be used for determining "measurably significant" (as defined in Title 27, section 20164) evidence of a release from the waste management unit and determining compliance with the water quality protection standard [Title 27, § 20415(e)(6) and (7)].

38. For statistical analysis of data, the Discharger shall use one of the methods described in Title 27, section 20415(e)(8)(A)-(E). A non-statistical data analysis method can be used if the method can achieve the goal of the particular monitoring program at least as well as the most appropriate statistical method [Title 27, § 20415(e)(8)]. The Discharger shall use a statistical or nonstatistical data analysis method that complies with Title 27, section 20415(e)(7, 8, 9, and 10), to compare the concentration of each constituent of concern or monitoring parameter with its respective background concentration to determine whether

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

39. The Discharger may propose an alternate statistical method [to the methods listed under Title 27, section 20415(e)(8)(A-D)] in accordance with Title 27, section 20415(e)(8)(E), for review and approval.

40. The statistical method shall account for data below the practical quantitation limit (PQL) with one or more statistical procedures that are protective of human health and the environment. Any PQL validated pursuant to Title 27, section 20415(e)(7) that is used in the statistical method shall be **the lowest concentration (or value) that can be reliably achieved** within limits of precision and accuracy specified in the WDRs or an approved Sample Collection and Analysis Plan for routine laboratory operating conditions that are available to the facility. The Discharger's technical report (Sample Collection and Analysis Plan and/or Water Quality Protection Standard Report), pursuant to Title 27, section 20415(e)(7), shall consider the PQLs listed in Appendix IX, Article 19 to Chapter 14 of Division 4.5 of Title 22, CCR, for guidance when specifying limits of precision and accuracy. For any given constituent monitored at a background or downgradient monitoring point, an indication that falls between the MDL and the PQL for that constituent (hereinafter called a "trace" detection) shall be identified and used in appropriate statistical or non-statistical tests. Nevertheless, for a statistical method that is compatible with the proportion of censored data (trace and ND indications) in the data set, the Discharger can use the laboratory's concentration estimates in the trace range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of "ties".

41. The water quality protection standard for organic compounds which are not naturally occurring and not detected in background groundwater samples shall be taken as the detection limit of the analytical method used (e.g., USEPA methods 8260 and 8270).

42. Alternate statistical procedures may be used for determining the significance of analytical results for common laboratory contaminants (i.e., methylene chloride, acetone, diethylhexyl phthalate, and di-n-octyl phthalate) if part of an approved water quality protection standard. Nevertheless, analytical results involving detection of these analytes in any background or downgradient sample shall be reported and flagged for easy reference by Central Valley Water Board staff.

43. **Confirmation of Measurably Significant Evidence of a Release.** Whenever a constituent is detected at a detection monitoring point at a concentration that exceeds the concentration limit from the water quality protection standard, the

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

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

b. Standard Monitoring Specification I.45 provides the procedure for analytes that are detected in 10 percent or greater of the background samples such as naturally occurring constituents like chloride.

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

a. **Initial Determination of Measurably Significant Evidence of a Release**. Identify each analyte in the **current** detection monitoring point sample that exceeds either its respective MDL or PQL, and for which a release has not been previously confirmed. The Discharger shall conclude that the exceedance provides a preliminary indication of a release or a change in the nature or extent of the release, at that monitoring point, if ***either:***

1) The data contains two or more analytes that equal or exceed their respective MDLs; or

2) The data contains one or more analyte that equals or exceeds its PQL.

b. **Discrete Retest** [Title 27, § 20415(e)(8)(E) and § 20420(j)(1-3)]:

1) In the event that the Discharger or Central Valley Water Board staff concludes (pursuant to paragraph I.44.a., above) that there is a preliminary indication of a release, then the Discharger shall **immediately** notify Central Valley Water Board staff by phone or e-mail and, within **30 days** of such indication, shall collect two new (retest) samples from the monitoring point where the release is preliminarily indicated and analyze them for the constituents that caused the need for the retest.

2) **Confirmation of a Release**. As soon as the retest data are available, the Discharger shall conclude that measurably significant evidence of a release is confirmed if (not including the original sample) two or more

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

a) **Immediately** verbally notify the Central Valley Water Board whether or not the retest confirmed measurably significant evidence of a release for the analyte at the monitoring point, and follow up with written notification submitted by certified mail **within seven days** of the verbal notification; and

b) Carry out the requirements of Section J, **RESPONSE TO A RELEASE** if a release has been confirmed.

c) Add any five-year analyte that is confirmed per this method to the monitoring parameter list such that it is monitored during each regular monitoring event.

45. **Verification Procedure for Analytes Detected in 10 percent or Greater of theBackground Samples.** The Discharger shall use either a statistical or non-statistical method pursuant to Title 27, section 20415(e)(8)(E) for all

analytes that are detected in 10 percent or greater of the background samples. The Discharger shall use one of the statistical methods required in Title 27, section 20415(e)(8)(E) unless another method has been proposed by the Discharger ina Water Quality Protection Standard Report (or equivalent report) and approvedby the Central Valley Water Board in a Monitoring and Reporting Program pursuant to Title 27, section 20415(e)(8)(A-D)] or section 20415(e)(8)(E). The method shall be implemented as follows:

a. **Initial Determination of Measurably Significant Evidence of a Release**. The Discharger shall compare the value reported by the laboratory for each analyte to the statistically-derived concentration limit from the most recent report (Annual Monitoring Report or Water Quality Protection Standard Report) that uses the approved statistical procedure. If the value exceeds the concentration limit for that constituent, the Discharger shall conclude that there in measurably significant evidence of a release [Title 27, § 20420(i)].

b. **Retest Method** [Title 27, § 20415(e)(8)(E) and § 20420(j)(1-3)].

1) In the event that the Discharger or Central Valley Water Board staff concludes (pursuant to paragraph I.45.a., above) that there is a preliminary indication of a release, then the Discharger shall **immediately** notify Central Valley Water Board staff by phone or e-mail and, within **30 days** [Title 27, § 20415(e)(8)(E)(3)] of such indication, the Discharger shall implement a verification procedure/retest option, in accordance with Title 27, sections 20415(e)(8)(E) and 20420(j)(2). The verification procedure shall include either a single “composite” retest (i.e., a statistical analysis that augments and reanalyzes the data from the monitoring point that indicated a release) or shall consist of at least two “discrete” retests

(i.e., statistical analyses each of which analyzes only newly-acquired data from the monitoring point that indicated a release) [Title 27,

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

2) **Confirmation of a Release**. As soon as the retest data are available, the Discharger shall evaluate the results pursuant to paragraph I.45.b.1, above and shall:

   a) **Immediately** verbally notify the Central Valley Water Board whether or not the retest confirmed measurably significant evidence of a release for the analyte at the monitoring point, and follow up with written notification submitted by certified mail **within seven days** of the verbal notification; and

   b) Carry out the requirements of Section J, **RESPONSE TO A RELEASE** if a release has been confirmed.

   c) Add any five-year analyte that is confirmed per this method to the monitoring parameter list such that it is monitored during each regular monitoring event.

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

J. RESPONSE TO A RELEASE

1. **Measurably Significant Evidence of a Release Has Been Confirmed**. If the Discharger has confirmed that there is measurably significant evidence of a release from a waste management unit pursuant to Standard Monitoring Specification I.44 or I.45, then the Discharger shall:

   a. **Immediately** sample all monitoring points in the affected medium at that waste management unit and determine the concentration of all monitoring parameters and constituents of concern for comparison with established concentration limits. Because this constituent of concern scan does not involve statistical testing, the Discharger will need to collect and analyze only a single water sample from each monitoring point in the affected medium [Title 27, § 20420(k)(1)].

   b. **Within 90 days** of confirming measurably significant evidence of a release, the Discharger shall submit an amended report of waste discharge to establish an Evaluation Monitoring Program meeting the requirements of Title 27, sections 20420(k)(5)(A-D), including but not limited to the results of sampling pursuant to paragraph J.1.a, above. The Evaluation Monitoring Program shall be designed for the collection and analysis of all data necessary to assess the nature and extent of the release and to determine the spatial distribution and concentration of each constituent throughout the zone affected by the release [Title 27, § 20420(k)(5) and § 20425(b)].

   c. **Within 180 days** of confirming measurably significant evidence of a release, the Discharger shall submit to the Central Valley Water Board an initial engineering feasibility study for a Corrective Action Program necessary to meet the requirements of Title 27, section 20430. At a minimum, the initial engineering feasibility study shall contain a detailed description of the corrective action measures that could be taken to achieve background concentrations for all constituents of concern [Title 27,

   § 20420(k)(6)].

   d. If the Discharger confirms that there is measurably significant evidence of a release from the waste management unit at any monitoring point, the Discharger may attempt to demonstrate that a source other than the waste management unit caused the evidence of a release or that the evidence is an artifact caused by an error in sampling, analysis, or statistical evaluation or by natural variation in groundwater, surface water, or the unsaturated zone. The Discharger may make a demonstration pursuant to Title 27, section 20420(k)(7) in addition to or in lieu of submitting both an amended report of waste discharge or an engineering feasibility study; however, the Discharger is not relieved of the requirements and due dates of Title 27, sections 20420(k)(6) & (7) unless Central Valley Water Board staff agree that the demonstration successfully shows that a source other than the

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

e. **Within 90 days** of the date that the Evaluation Monitoring Program from paragraph J.1.b is approved (the date is it established), the Discharger shall complete and submit the following:

i) **Results and Assessment for the Evaluation Monitoring Program.** A report with the results and assessment based on the approved Evaluation Monitoring Program [Title 27, § 20425(b)].

ii) **Updated Engineering Feasibility Study.** An updated engineering feasibility study for corrective action based on the data collected to delineate the release and data from the ongoing monitoring program required under Title 27, section 20425(e) [Title 27, § 20425(c)].

iii) **Amended ROWD for a Corrective Action Program.** An amended report of waste discharge to establish a Corrective Action Program meeting the requirements of Title 27, section 20430 based on the data collected to delineate the release and based on the updated engineering feasibility study [Title 27, § 20425(d)].

K. GENERAL PROVISIONS

1. In the event the Discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the Discharger shall notify the appropriate Central Valley Water Board office by telephone **as soon as** it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing **within two weeks**. The written notification shall state the nature, time, and cause of noncompliance, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.

2. All reports and transmittal letters shall be signed by persons identified below:

   a. For a corporation: by a principal executive officer of at least the level of senior vice-president.

   b. For a partnership or sole proprietorship: by a general partner or the proprietor.

c. For a municipality, state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.

d. A duly authorized representative of a person designated in a, b, or c aboveif:

1) The authorization is made in writing by a person described in a, b, or c of this provision;

2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a Unit, superintendent, or position of equivalent responsibility (a duly authorized representative may thus be either a named individual or any individual occupying a named position); and

3) The written authorization is submitted to the Central Valley Water Board.

e. Any person signing a document under this Section shall make the following certification:

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

3. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the State resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature, extent, and impact of the noncompliance.

4. The owner of the waste management facility shall have the continuing responsibility to assure protection of waters of the state from discharged wastes and leachate generated by discharged waste during the active life, closure, and any post-closure maintenance period of the waste management units and during subsequent use of the property for other purposes.

5. The fact that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this Order shall not be regarded as a defense for the Discharger's violations of this Order.

6. The Discharger shall notify the Central Valley Water Board of a material change in; the types, quantity, or concentrations of wastes discharged; site operations and features; or proposed closure procedures, including changes in cost estimates. This notification shall be given a reasonable time before the changes are made or become effective. No changes shall be made without Central

Valley Water Board approval following authorization for closure pursuant to the site Notification of Closure [Title 27, § 21710(a)(4)].

7. The Discharger shall maintain legible records of the volume and type of each waste discharged at each waste management unit or portion of a unit, and the manner and location of discharge. Such records shall be maintained by the Discharger until the beginning of the post-closure maintenance period. These records shall be on forms approved by the State Water Board or Central Valley Water Board and shall be maintained at the waste management facility until the beginning of the post-closure maintenance period. These records shall be available for review by representatives of the State Water Board or Central Valley Water Board at any time during normal business hours. At the beginning of the post-closure maintenance period, copies of these records shall be sent to the Central Valley Water Board [Title 27, § 21720(f)].

8. In the event of any change in landowner or the operator of the waste management facility, the Discharger shall notify the succeeding owner or operator in writing of the existence of this Order. A copy of that notification shall be sent to the Central Valley Water Board.

9. In the event of any change of ownership or responsibility for construction, operation, closure, or post-closure maintenance of the waste discharge facilities described in this Order, the Discharger shall notify the Central Valley Water Board prior to the effective date of the change and shall include a statement by the new Discharger that construction, operation, closure, or post-closure maintenance will be in compliance with this Order and any revisions thereof [Title 27, § 21710(c)(1)].

10. To assume ownership or operation under this Order, the succeeding owner or operator must apply in writing to the Central Valley Water Board requesting transfer of the Order within **14 days** of assuming ownership or operation of this facility. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory requirements contained in General Provision K.2 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the Water Code. Transfer of this Order shall be approved or disapproved by the Central Valley Water Board.

L. STORM WATER PROVISIONS

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

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

5. Collection and holding facilities associated with precipitation and drainage control systems shall be emptied immediately following each storm or otherwisemanaged to maintain the design capacity of the system [Title 27, § 20365(d)].

6. Surface and subsurface drainage from outside of a waste management unitshall be diverted from the unit [Title 27, § 20365(e)].

7. Cover materials shall be graded to divert precipitation from the waste management unit, to prevent ponding of surface water over wastes, and to resisterosion as a result of precipitation [Title 27, § 20365(f)].

8. Any drainage layer in a final cover shall be designed and constructed to intersect with the final drainage system for the waste management unit in amanner promoting free drainage from all portions of the drainage layer [Title 27, §20365(f)].

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

WASTE DISCHARGE REQUIREMENTS ORDER R5-2022-0047
FOR
RECOLOGY
RECOLOGY HAY ROAD LANDFILL AND JEPSON PRAIRIE ORGANICS
SOLANO COUNTY

INFORMATION SHEET

Background and Site Conditions

1. Prior to the initiation of landfill operations in 1964, the site was undeveloped or was potentially used as rangeland. A homestead was present in the vicinity of the current DM-2.1 footprint. The landfill facility has been in operation since 1964, accepting household, commercial, industrial, construction and demolition, and/or special wastes from San Francisco, Vacaville, Fairfield, and other incorporated and unincorporated areas of Solano County and areas in Northern California. A portion of the facility previously operated as a burn dump from 1967 to 1972 primarily in the footprint of LF-1. In 1972 burn dump operations ceased and LF-1 began being operated as a landfill. Exploratory borings suggest that the DM-1A was operated as a trench and fill type operation for an unknown amount of time prior to the adoption of Subtitle D in 1994.

2. The landfill facility has been in operation since 1964, accepting household, commercial, industrial, construction and demolition, and/or special wastes from San Francisco, Vacaville, Fairfield, and other incorporated and unincorporated areas of Solano County and areas in Northern California. A portion of the facility previously operated as a burn dump from 1967 to 1972. The facility is currently owned and operated by Recology.

Geology and Hydrology

3. The Sacramento Valley is part of the Great Valley sedimentary basin, a 22,500 square mile area comprising California’s Central Valley. The Great Valley area is bounded by the Coast Range to the west, the Sierra Nevada to the east, the Tehachapi Mountains to the south, and the Klamath Mountains to the north. Continental deposits in the Sacramento Valley consist of alluvial, fluvial, delta, and flood plain sediments generated by glaciation processes in the Sierra Nevada, and by weathering and erosion in the surrounding mountain ranges. Deposited over geologic time by the Sacramento and San Joaquin Rivers and their tributaries, such sediments are estimated to be thousands of feet thick in some areas. Underlying the continental deposits are ancient marine deposits.

Waste Characteristics

4. 12,300 cubic yards of Lead-contaminated soil (LC-soil) previously accepted from the City of San Francisco Metro Muni project, re-classified as “nonhazardous” by the Department of Toxic Substances Control (pursuant to 22 Cal. Code Regs., 66260.200(f), Title 22), and approved by the Central Valley Water Board on 28 September 1993 is stockpiled on Unit LF-2, module DM-2.1 beneath the DM-2.2 eastern side slope liner. Although DM-2.1 is a Class III unit and the LC-soil is a designated waste, the Discharger received a variance from the Central Valley Water Board to stockpile LC-Soils on DM-2.1 from the Islais Creek Contract B Project and the Embarcadero Roadway project on 16 November 1994 and 25 February 1994, respectively. The LC-Soil stockpiles include long term stockpiles for future beneficial reuse such as foundation soil for final cover and operational stockpiles for beneficial reuse such as ADC.

5. Since September 1992, waste discharges to LF-1 have been limited to inert wastes (e.g., concrete, asphalt, and tires). LF-1 also accepts friable and non-friable asbestos. Up to 11,000 tons (3,667 tons/year) of asbestos containing waste (ACW) are estimated to have been discharged to LF-1 since January 2013. These classified wastes may be discharged only in accordance with Title 27, Resolution No. 93-62, and the Code of Federal Regulations, Title 40, part 258 as required by this Order.

6. In January 2009, the Discharger completed installation of a leachate recirculation system at LF-3, DM-11 in accordance with a design report approved by Central Valley Water Board staff. The system included construction of a 300-foot long, 13-foot deep infiltration trench on top of the module and associated valves and piping. One foot of tire chips were placed on the bottom of the trench overlain by the leachate injection pipe and another 3 feet of tire chips. The trench was then backfilled with waste and capped with intermediate cover. PVC piping was also installed to convey leachate from the module’s LCRS sumps to the infiltration trench. Each sump was equipped with a flow meter and shut-off valve to track the quantity of liquid re-circulated back into the unit and switch flows back to the leachate storage tanks when desired. No re-circulation system has been installed or is currently proposed for installation at LF-4.