

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2015-XXXX

WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF SACRAMENTO UTILITIES DEPARTMENT
SYLVIA DELLAR SURVIVOR'S TRUST
DELLAR LANDFILL
UNCLASSIFIED LANDFILL
CLOSURE, POSTCLOSURE MAINTENANCE,
AND CORRECTIVE ACTION MONITORING
SACRAMENTO COUNTY

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

1. The Sylvia Dellar Survivor's Trust (property owner) and the City of Sacramento Utilities Department (former operator), hereinafter jointly referred to as Discharger, owns and maintains the Dellar Landfill, a partially-closed, municipal solid waste (MSW) landfill about 1½ miles northeast of downtown Sacramento, as shown in Attachment A: Location Map (incorporated by reference under Finding 2 below). The facility is regulated under the California Water Code, section 13000 et seq. and the California Code of Regulations, title 27, section 20005 et seq. (Title 27). The facility is not subject to federal Subtitle D regulations (40 C.F.R. 258) (a.k.a., "Subtitle D"), or State Water Resources Control Board (State Water Board) Resolution 93-62, because it did not accept wastes after 9 October 1991, the effective date of Subtitle D [see 40 C.F.R. 258.1(c)],
2. The following documents are attached to this Order and hereby incorporated into and made a part of this Order by reference:
 - a. Attachment A – Location Map
 - b. Attachment B – Site Map
 - c. Attachment C – Facility Map
 - d. Information Sheet
 - e. November 2013 Standard Provisions and Reporting Requirements For Industrial Facilities (SPRRs)

The attachment maps show the location of items described in the WDR findings (e.g., Dellar Landfill, adjacent 28th Street Landfill and unclassified fill area, gas and groundwater monitoring wells) while the Information Sheet provides additional or supplementary landfill information. The SPRRs contain non-site specific requirements common to pre-Subtitle D landfills referenced, as applicable, under various WDR specifications and provisions of this order. See Finding 11.

3. The facility is located at 2401 A Street immediately south of the American River and north of the termini of 24th and 25th Streets in Sacramento. The 29-acre site consists of the following six parcels of land: APNs 001-0160-008, 001-0160-009, 001-0160-013,

001-0160-038, 001-0160-039, and 003-0032-013. The property is in Section 31, T9N, R5E, MDB&M and its geographic coordinates are Latitude 38.587° north, Longitude - 121.470° west. See Attachment A.

4. The landfill is a “closed, abandoned, or inactive” (CAI) unit under Title 27 regulations and has not been previously regulated by WDRs. In a 13 June 2013 letter, Central Valley Water Board staff notified the Discharger that the landfill was subject to Title 27 corrective action provisions and requested that the Discharger submit an application for waste discharge requirements (WDRs) and Report of Waste Discharge (RWD), including Joint Technical Document (JTD) Index. On 30 December 2013, the Discharger submitted the RWD and JTD Index, including or referencing the following information:
 - a. A project history and waste disposal information;
 - b. Groundwater monitoring data;
 - c. A Partial Final Closure and Postclosure Maintenance Plan;
 - d. A Partial Closure Certification Report; and
 - e. A description of landfill controls and monitoring systems.

A completed application form was received on 3 July 2014. Additional information related to the landfill was received in January 2015. See Findings 34 (gas monitoring) and 82 (closure of levee corridor area). This WDR Order includes findings, regulatory references, and requirements appropriate for the closed landfill based on the RWD and a review of the project files.

5. The landfill is one of several properties within a 130-acre fill area west of 28th Street historically operated by the City of Sacramento, or used for public dumping, prior to start-up of the 28th Street Landfill (east of 28th Street) in the early 1970s. The 28th Street Landfill is regulated under separate WDRs Order No. R5-2004-0039 and has been closed since 1997. The operational history of the historical fill area is summarized in the Information Sheet attached to this Order.
6. The Dellar landfill operated from July 1957 to December 1963, accepting primarily household wastes from the City of Sacramento service area. The City of Sacramento operated the landfill during its entire active period under written agreements with the property owners at that time (R. Cannon and A. Lucas). After cessation of waste disposal operations in 1963, the site was left with about one foot of uncompacted soil cover, but was not capped and graded. The City then moved its waste disposal operations to other parcels in the historical fill area.
7. Over the years following cessation of operations, the landfill underwent substantial differential settlement, resulting in pot hole-like depressions and hummocky conditions over most of the landfill cover surface. The landfill also had a history of subsurface fires. Site inspections conducted by Central Valley Water Board staff from 1992 to 2010 documented these and related deficiencies at the site, such as exposed waste, storm water ponding, and infiltration into landfill wastes. Groundwater degradation has also

been detected down gradient of the site (see Finding 42).

8. In 2008, the Executive Officer issued a Cleanup and Abatement Order requiring that the Discharger submit a Final Closure and Postclosure Maintenance Plan to close the landfill as a corrective action measure to address the above issues. The Discharger subsequently installed final cover on most of the landfill footprint in accordance with a 2011 partial Final Closure and Postclosure Maintenance Plan (FC/PCMP) approved by Central Valley Water Board staff. See Findings 68 and 72. These WDRs require that the Discharger submit a revised FC/PCMP to complete closure of the remaining areas of the landfill as a corrective action measure.
9. Landfill-related facilities at the site include the landfill unit (23.9 acres), detention basins and other storm water controls, containment berms, groundwater monitoring wells and access roads. Other onsite facilities include an active radio transmission tower; power poles; a river levee, and a perimeter fence. The landfill monitoring wells are actually part of the monitoring system for the closed 28th Street Landfill east of the site, but are also used to monitor the Dellar Landfill. The radio transmission tower is not associated with the landfill and is in a separate fenced area. See Attachment B and Attachment C.
10. Due to the age of the former landfill operation, the landfill was constructed without a base liner or leachate collection and recovery system (LCRS).
11. 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 J of these WDRs below, and in the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Industrial Facilities (SPRRs)*, dated November 2013, which is part of this Order. Monitoring and reporting requirements are included in the Monitoring and Reporting Program (MRP) No. R5-201X-XXXX and in the SPRRs. In general, requirements that are either in regulation or otherwise apply to all MSW landfills are considered to be "standard" and are therefore in the SPRRs. Any site-specific changes to a requirement in the SPRRs are included in the applicable section (A through J) of these WDRs, and the requirement in the WDRs supersedes the requirement in the SPRRs.
12. Title 27 contains regulatory standards for discharges of solid waste promulgated by the State Water Board and the California Department of Resources Recovery and Recycling (CalRecycle). In certain instances, this Order cites CalRecycle regulatory sections. Title 27, section 20012 allows the Central Valley Water Board to cite CalRecycle regulations from Title 27 where necessary to protect water quality provided it does not duplicate or conflict with actions taken by the Local Enforcement Agency (LEA) in charge of implementing CalRecycle's regulations.

WASTE AND UNIT CLASSIFICATIONS

13. The landfill accepted primarily household and commercial refuse (e.g., garbage, rubbish, yard trimmings, and street cleaning wastes) classified as nonhazardous, municipal solid wastes (MSW) under Title 27 regulations. See Appendix A, December 2004 *Site Summary Report, 28th Street Landfill (Dellar Properties)*, prepared by Alisto Engineering Group.
14. Average landfill disposal rates and total in-place tonnage are unknown due to a lack of historical records, but have been estimated based on various assumptions. See Information Sheet.
15. The landfill is an existing, unclassified landfill under Title 27 regulations because it predates Title 27 standards; has not been previously classified under WDRs; and, based on review of the unit's design (See Finding 56), cannot be retrofitted to meet Title 27 standards per section 20080(e). Title 27 prescriptive standards for waste containment therefore do not generally apply to the facility.

SITE DESCRIPTION

16. The site is immediately south of the American River and adjoining levee about two miles upstream of the confluence with the Sacramento River. Topographic relief in the area is generally flat, except in developed areas (e.g., landfills, levees, freeway, railroad crossings), with natural grades less than 2% toward the west. Surface elevations in the area generally range from 25 to 40 feet above mean sea level (MSL).
17. The site is bounded by the American River and adjoining levee to the north; historical fill to the east (Bell Marine and the closed 28th Street Landfill); A Street (an unimproved road) and historical fill to the south (Cannon and Scollan parcels), and vacant land owned by the California Almond Growers Exchange to the west. In addition to historical fill operations, land uses in the area include residential (e.g., New Era Park); recreational (e.g., American River corridor, City parks); industrial (e.g., warehouses, concrete aggregate yard, food processing), transportation (Business 80 freeway) and open space. A new residential development (McKinley Village) has also been proposed for a 44-acre tract of land southeast of the landfill. See Attachment B.
18. Native vegetation in the area includes annual grasses, forbs, shrubs (e.g., elderberry), and scattered trees such as cottonwood and oak. More dense and varied vegetation occurs where there is more water, such as riparian foliage within the American River corridor and vegetation in developed/landscaped areas (e.g., Sutter's Landing Park, adjacent residential neighborhoods).
19. A January 2014 Department of Water Resources (DWR) well survey identified at least 12 supply wells within a one-mile radius of the site, including 3 domestic wells (to the southwest, west, and east, respectively); 5 industrial wells (3 to the west and 2 to the southwest); 1 irrigation well (one-half mile to the southeast); and 2 wells designated as

“other use” about one mile to the southwest. Well depths ranged from about 30 to 300 feet bgs. Water yields for these wells ranged from 200 to 1,150 gallons per minute (gpm). The closest domestic well was approximately 4,000 feet east of the site.

20. The landfill footprint is within the 100-year flood plain of the American River, but within an area protected from a 100-year flood by levee based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate last revised in August 2012 (Community-Panel No. 180, Map No. 06067C0180H). Both halves of the site are designated on the FEMA map as within “Zone X”, for which no base line (i.e., 100-year) flood elevations are specified.^{1,2}
21. The 100-year, 24-hour precipitation event for the site area is about 3.87 inches based on historical Rainfall Depth Duration Frequency data for the Sacramento PO Station about ½ mile southwest of the site. The site receives an average of about 18.5 inches per year of precipitation. The mean annual Pan A evaporation at the site is about 51 inches per year based on monthly average historical data from DWR’s CIMIS Weather Station 155 (Bryte) about 3½ miles west of the site along the Sacramento River. Mean monthly evaporation is estimated to exceed mean monthly precipitation in all months of the year, except January and December.³ Net average annual evaporation at the site is estimated to be about 32.5 inches.

Geology

22. The Sacramento Valley area is in the Great Valley alluvial plain, a 22,500 square mile area comprising California’s Central Valley. The area is bounded by the Cascade Mountain 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 Lower Sacramento Valley consist of alluvial, flood plain, and delta sediments generated by erosion and/or glaciation processes in the Sierra Nevada and Coast Range Mountains. Deposited over geologic time by the Sacramento and San Joaquin Rivers and their tributaries, such sediments are estimated to be up to 9,000 feet thick in some areas. Underlying the continental deposits are up to 25,000 feet of ancient marine deposits. The oldest sediments in the Great Valley date back to the Jurassic Period.

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1. “Zone X” includes areas within the 500-year flood plain (0.2% annual chance of flooding) and areas within 100-year flood plain (1.0% annual chance of flooding) that include areas with expected average flood depths less than one foot; areas with a contributing drainage area of less than 1 square mile; and/or areas protected from the base flood by levee.
 2. The 2012 FIRM map actually shows most of the eastern half of the site is shown as outside of the 100-year flood zone, but the entire area corresponds to the landfill within the 500-year flood zone.
 3. Based on comparison of monthly evapotranspiration data from the CIMIS (Bryte) weather station with monthly precipitation data from the Sacramento PO weather station 3 miles to the east of the Bryte station.

23. The Sacramento area is generally underlain by the following sedimentary formations:

<u>Formation</u>	<u>Age</u>	<u>Depth Range, bgs</u>	<u>Description</u>
Modesto/ Riverbank	Mid-to-late Pleistocene	0 to 125	Stream channel and flood basin deposits (e.g., cobble, gravel, coarse sand interspersed with silt, clay, and fine sand)
Laguna	Pliocene and early Pleistocene	125 – 375	Alluvium (e.g., silt, sand and clay interspersed with gravel lenses)
Mehrten	Miocene	>375	Alternating sequences of andesitic (dark-colored) alluvium confined by volcanic deposits (e.g., tuff-breccia)

24. Soil in the project area generally consists of flood plain deposits and alluvial material deposited prior to construction of river levees. Some of the sediment is material washed down from historical gold mining activities conducted upstream in the American River corridor. Surface soil in the area has been mapped as Columbia sandy loam, a moderately-permeable alluvial soil found in narrow, low-lying flood plains along rivers and streams.⁴ Slopes in such areas typically range from 0% to 2%. The upper five feet typically consists of yellowish-brown, sandy loam underlain by stratified layers of yellowish-brown sandy loam, silty loam, and/or sand. Clay layers may be present in surface soil in some areas. Well boring logs from the project and nearby areas are consistent with the regional geological model and Soil Conservation Service descriptions, indicating that the area is underlain by alluvial deposits, including, but not limited to silty or clayey sand, sandy or silty clay, and/or sandy or clayey silt.

25. The nearest quaternary faults to the site are in the Foothills Fault System to the east and the Great Valley Fault Zone to the west, as follows:

a. Foothills Fault System

- i. Rescue and Maidu East faults about 35 miles to the northeast just east of Folsom Lake;
- ii. Deadman and Dewitt Faults about 38 miles to the northeast near Auburn;
- iii. Spenceville Fault about 40 miles to the northeast east of Wheatland;
- iv. Lone Fault about 42 miles to the southeast near Lone;
- v. Swain Ravine Fault about 56 miles to the north-northeast half way between Yuba City and Grass Valley; and
- vi. Cleveland Hills Fault about 73 miles to the north near Oroville.

4. See April 1993 report *Soil Survey of Sacramento County, California*, Soil Conservation Service, U.S. Department of Agriculture; Page 34.

- b. Great Valley Thrust Zone
 - i. Fault Segment 3 --Dunnigan Hills Fault about 28 miles to northwest near Dunnigan; and
 - ii. Fault Segment 4 -- Vaca Fault about 39 miles to the southeast in Vacaville.
26. The closest known active fault systems to the site are the Great Valley Thrust Zone, Fault Segment 4 and the northern reach of the Foothills Fault System. The Great Valley Thrust Zone is a submerged fault system that trends north-south along the eastern foothills of the Coast Range. In 1892, an earthquake registering 6.5 on the Richter scale occurred in Winters and Vacaville along the Vaca Fault in this fault zone. The Foothills Fault System trends NW-SE along the western foothills of the Sierra Nevada Mountains. In 1975, an earthquake registering 5.8 on the Richter scale occurred along the Cleveland Hills Fault (Foothills Fault System) near Oroville. There are no known Holocene faults within 1,000 feet of the facility.
27. The maximum probable earthquake (MPE) for the site is estimated to be about 6.5 on the Richter scale based on the 1892 Vacaville/Winters quake noted above. A maximum magnitude earthquake of 6.6 and a peak horizontal ground acceleration of 0.194 g were computed for the site based on an areally-distributed hazard in the Foothills Fault System.⁵

SURFACE WATER CONDITIONS

28. Natural drainage toward the American River is blocked by the American River levee, which was constructed in the early 1900s in response to a series of historical floods that inundated the City. See Information Sheet. Since construction of the levee system and other City infrastructure projects of that era, most engineered runoff from the area has been directed to the City's combined sewer system, which currently conveys commingled sewage and storm water flows to the Sacramento County Regional Sanitation District's Regional Wastewater Treatment Plant. Runoff not directed to the combined sewer system either infiltrates into the ground or dissipates through evaporation. The final cover constructed over the majority of the landfill footprint in 2012 directs storm water runoff to two onsite detention basins from which it is periodically pumped into the City's combined sewer system to minimize standing water. See Finding 75.

Some runoff from the northern perimeter of the 28th Street Landfill facility east of the site is discharged into the American River corridor under a General Industrial Storm Water Permit. Runoff within the American River corridor, including the north side of the levee, discharges to the American River. There are no other known permitted or unpermitted surface water discharges to the American River from the project area.

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

29. The *Water Quality Control Plan for Sacramento and San Joaquin River Basins, Fourth Edition*, designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.
30. The designated beneficial uses of the American River stated in the Basin Plan are municipal and domestic supply; agricultural supply; industrial service supply; hydropower generation; water contact recreation; non-contact water recreation; warm freshwater habitat; cold freshwater habitat; migration of aquatic organisms; spawning, reproduction and/or early development; and wildlife habitat.

UNSATURATED ZONE CONDITIONS

31. No lysimeters or other soil pore water devices were installed or required prior to construction of the landfill, which predated current monitoring standards under Title 27. The Discharger has also adequately demonstrated that it would be infeasible and impractical to retrofit the landfill with lysimeters given that the footprint has already been established and that the landfill is unlined. As such, a leachate release to the unsaturated zone from the landfill can only be inferred from detected groundwater impacts beneath the site. A landfill gas (LFG) release to the unsaturated zone may, however, be detected by installation of gas probes.
32. The landfill predated Title 27 requirements for LFG monitoring and no LFG or soil gas monitoring probes have ever been installed in waste at the site. Until recently, the nearest soil gas monitoring wells to the site were eight perimeter compliance wells (DMPs 1 through 8) for the 28th Street Landfill historically installed along the southern side of the Union Pacific Railroad tracks southeast of the site. Historical monitoring results for the closest of these wells (DMPs 1 through 4) indicated only low to non-detect concentrations of LFG constituents, however. See Attachment B.
33. A recent investigation by the Discharger in response to an LEA directive indicated that several of the perimeter compliance wells at the 28th Street Landfill, including those proximate to the Dellar Property noted above, were damaged, improperly screened, and/or otherwise did not meet Title 27 gas well completion standards. At the request of the LEA and CalRecycle, the City subsequently developed a work plan to replace the old perimeter gas monitoring system with Title 27-compliant, multi-tier gas monitoring wells. As of December 2014, 19 new gas monitoring wells had been installed along the perimeter of the 28th Street Landfill site, including one (S-5) along the eastern perimeter of the Dellar landfill (about 200 feet north of groundwater monitoring well C-13) and the other (S-4) about 450 feet south of the southeast corner of the Dellar Landfill near old gas well DMP-1. See Attachment B.
34. MSW landfills commonly generate LFG during the waste decomposition process that can impact or threaten groundwater quality if not controlled. While limited investigations of the Dellar Property conducted to date (e.g., bar hole punch sampling conducted by CalRecycle in 2003) have not detected significant amounts of LFG, logging of wastes

excavated during 2012 closure activities revealed the presence of significant amounts of un-decomposed organic material remaining in the landfill (e.g., wood, newspapers, cardboard). Further, recent sampling of the new perimeter gas wells for the 28th Street Landfill has indicated methane concentrations ranging from 38% by volume up to 52% by volume in the probes of gas well S-5.

To better assess whether the Dellar Landfill may be generating significant amounts of LFG and the possible need for LFG controls, these WDRs require that the Discharger submit a work plan for the installation of LFG monitoring probes in landfill waste. See Corrective Action Specification D.5. Once installed, the probes are required to be monitored in accordance with the MRP for at least one year. After completion of the one-year in situ gas investigation, LFG monitoring may be discontinued if it is determined that the landfill is not generating LFG. However, if the in situ gas investigation determines that the landfill is generating gas in concentrations that could threaten water quality, these WDRs require that the Discharger submit and implement a corrective action work plan for the implementation of LFG controls and soil gas monitoring probes at the site, as necessary, to mitigate the source, and define the extent of impacts. See Corrective Action Specification D.6 and Provision J.7.f.

35. As noted in Finding 55, waste was discharged below the water table on the west half of the site such that there is no separation from high groundwater in those areas. The areas of the landfill footprint and portions of the landfill waste column that are in contact with groundwater at some time during a year are unknown.

GROUNDWATER CONDITIONS

36. The uppermost aquifer beneath the site occurs in Modesto/Riverbank alluvium at an average elevation of about 6 feet MSL +/- 3 feet of seasonal variation. The depth to groundwater at the site ranges from about 18 to 24 feet below ground surface (bgs), depending on location and water table elevation. Groundwater elevations at the Dellar Property are strongly influenced by water levels in the American River, which vary seasonally up to about 10 feet (i.e., 0 to 10 feet MSL) depending on a variety of factors (e.g., rainfall, snow melt, dam releases).
37. The groundwater flow direction also varies seasonally and is locally affected by a bend in the American River near the site, which produces a radial flow in the Dellar Property area. In the wet season, groundwater flow is generally toward the southwest away from the bend in the river, while in the summer, the gradient is either flat or, when there is a flow reversal, flows in a radial fashion toward the river bend to the northeast. The magnitude of the gradient varies from about 0 to 1 ft/1,000 ft depending of the time of year.
38. Background groundwater quality in the uppermost aquifer at the site is quite good due to the influence of the American River. Background concentrations of general minerals in the shallow groundwater include total dissolved solids (TDS) at about 162 mg/L,

electrical conductivity at about 276 mg/L, chloride at about 5 mg/L, sulfate non-detect, and bicarbonate alkalinity at about 116 mg/L. See Finding 42.

39. The beneficial uses of underlying groundwater stated in the Basin Plan are municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply.
40. The Dellar Property is within the groundwater monitoring well field for the 28th Street Landfill. There are currently seven 28th Street Landfill groundwater monitoring wells completed in the uppermost aquifer relevant to the Dellar Property, including two upgradient/background wells (B-4 and B-15); three down gradient wells (C-14, D-18, D-19, and D-20); and one well subject to gradient reversals (C-13). Wells C-14 and D-18 are located along B Street about 500 feet south of the Dellar Property and contiguously monitor the Dellar Landfill and two small parcels immediately south of the Dellar Property (owned by Cannon Family Trust and Scollan Credit Trust). The latter parcels were historically landfilled about the same time as the Dellar Property. See Attachment B.
41. Title 27, section 20415(b)(1) requires that the Discharger establish a sufficient number of monitoring wells along the landfill Point of Compliance (e.g., downgradient perimeter of unit) for detection and corrective action monitoring purposes. See Monitoring Specification G.9. Currently, there is only one monitoring well (C-13) at the site along the unit perimeter, and it is down gradient of the landfill only during gradient reversals that can occur during the dry season. To comply with Title 27 requirements for Point of Compliance monitoring, these WDRs therefore require that the Discharger submit a work plan for the installation of a Point of Compliance well along the southwestern perimeter of the unit. See Provision J.6.a and Attachment B (shows the approximate location where new Point of Compliance well is needed).
42. The City of Sacramento has been monitoring wells in the Dellar Property area under the WDRs for the 28th Street Landfill since the early 1990s. Historical monitoring data for these wells shows elevated concentrations of general minerals in groundwater down gradient of the landfill, as highlighted in bold in the following summary table:

Constituent	Statistic	Concentration (mg/L, except where noted) ^{1,2}			
		Background	Sidegradient	Downgradient	
		Upper Zone		Lower Zone	
		Well B-4 ³	Well C-13 ³	Well C-14	Well D-18
Alkalinity	2013	150	400	930	380
	20-Yr Avg.	110	390	700	375
	Range	60 - 230	300 - 650	580 - 930	200 - 600

Chloride	2013	4.3	37	120	110
	20-Yr Avg.	5	175	155	180
	Range	4 - 16	20 - 405	40 - 230	40 - 320
Sulfate	2013	0.46	0.42	31	0.93
	20-Yr Avg.	<1	<1	40	<1
	Range	<1 - 4.5	<1 - 3	<1 - 140	<1
TDS	2013	170	460	920	520
	20-Yr Avg.	140	410	900	750
	Range	70 - 275	260 - 850	750 - 1,500	280 - 900
Specific Conductance (mhos/cm)	2013	280	590	1,800	880
	20-Yr Avg.	375	1,600	1,950	1,400
	Range	120 - 700	590 - 2,200	1,400 - 3,100	400 - 2,350
Dissolved Iron	2013	25	18	5.0	1.8
	20-Yr Avg.	35	15	10	<1
	Range	10 - 70	5 - 35	1 - 21	<1 - 15

1. Based on December 1993 through December 2013 semiannual monitoring data.
2. <"x" denotes non-detect where "x" is method detection limit (MDL).
3. Well upgradient, except during periods in dry season when gradient may be flat or reversed.

The highest concentrations of general minerals were detected in well C-14, directly down gradient of the Dellar Landfill and adjacent historically filled (Cannon Family Trust and Scollan Credit Trust) parcels. Lower, but still elevated concentrations of general minerals were detected further down gradient of the landfill in upper zone in wells C-19 and D-20 (not shown above); sidegradient in well C-13; and directly down gradient in lower zone well D-18 (adjacent to C-14). The lowest concentrations of general minerals were detected in the upgradient wells near the American River (B-4 and B-15). The chemistry in the above wells, including the upgradient wells, also appears to be influenced by bicarbonate alkalinity and dissolved iron, which could be artifacts of LFG migration and/or the reducing effects of waste decomposition on the groundwater chemistry.

43. Time series plots of groundwater monitoring data for the down gradient wells generally showed strong-to-moderate declining trends for chloride and TDS, and stable levels or slight declining trends for specific conductance and alkalinity, over the past 20 years. Strong declining trends were noted for chloride in wells C-13, C-14, and D-18 and TDS in well C-14, supporting evidence of an historical release from the landfill. More moderate historical declines for chloride and TDS occurred in the other down gradient wells. No clear trends were noted for sulfate or dissolved iron in any of the wells. Dissolved iron was higher in background well B-4 than in the down gradient wells and had relatively stable historical trends consistent with other wells near the American River associated with the 28th Street Landfill. It is unknown whether the dissolved iron

detected in groundwater at the site is associated with landfill impacts, natural spatial variability of the groundwater, or both.

44. Low to trace concentrations of volatile organic compounds (VOCs) have also been historically detected in wells down gradient (i.e., south and SW) of the Dellar Property, including Chlorobenzene and 1,4-Dichlorobenzene up to 1.4 mg/L and 3.5 mg/L, respectively, in well C-14; Chloroform up to 9.5 mg/L in well D-19; Trichloroethylene up to 1.8 mg/L in well D-20; and various other intermittently-detected VOCs. The historical monitoring results for the site may be summarized as follows:

Constituent	Metric	Concentration (mg/L) ^{1,2,3}			
		Upper Zone			Lower Zone
		South		SW	South
		Well C-14	Well D-19	Well D-20	Well D-18
Benzene	<i>Max 2013⁴</i>	<0.2	<0.2	<0.2	<0.2
	<i>10-Yr Avg.</i>	<0.2	<0.2	<0.2	<0.2
	<i>10-Yr Range</i>	<0.2	<0.2	<0.2	<0.2 – 0.6
Chlorobenzene	<i>Max 2013⁴</i>	1.0	<0.2	<0.2	<0.2
	<i>10-Yr Avg.</i>	0.8	<0.2	<0.2	<0.2
	<i>10-Yr Range</i>	<0.2 – 1.4	<0.2	<0.2	<0.2
Chloroform	<i>Max 2013⁴</i>	<0.2	4.0	<0.2	<0.2
	<i>10-Yr Avg.</i>	<0.2	4.0	<0.2	<0.2
	<i>10-Yr Range</i>	<0.2	<0.2 – 9.5	<0.2	<0.2
1,2-Dichlorobenzene	<i>Max 2013⁴</i>	0.30	<0.2	<0.2	<0.2
	<i>10-Yr Avg.</i>	0.5	<0.2	<0.2	<0.2
	<i>10-Yr Range</i>	<0.2 – 1.0	<0.2	<0.2	<0.2
1,4-Dichlorobenzene	<i>Max 2013⁴</i>	1.9	<0.2	<0.2	<0.2
	<i>10-Yr Avg.</i>	1.7	<0.2	<0.2	<0.2
	<i>10-Yr Range</i>	<0.2 – 3.5	<0.2	<0.2	<0.2 – 2.1
1,2-Dichloroethane	<i>Max 2013⁴</i>	< 0.44	<0.2	0.5	<0.2
	<i>10-Yr Avg.</i>	<0.2	<0.2	<0.2	<0.2
	<i>10-Yr Range</i>	<0.2	<0.2 – 0.3	<0.2 – 0.5	<0.2
Tetrachloroethylene	<i>Max 2013⁴</i>	<0.2	<0.2	<0.2	<0.2
	<i>10-Yr Avg.</i>	<0.2	<0.2	<0.2	<0.2
	<i>10-Yr Range</i>	<0.2	<0.2	<0.2 – 0.2	<0.2
Trichloroethylene	<i>Max 2013⁴</i>	<0.2	<0.2	1.4	<0.2
	<i>10-Yr Avg.</i>	<0.2	<0.2	1.2	<0.2
	<i>10-Yr Range</i>	<0.2	<0.2	<0.2 – 1.8	<0.2

1. Based on December 2003 through December 2013 semiannual monitoring data.

2. <"x" denotes non-detect where "x" is method detection limit (MDL).
3. Concentrations above practical quantitation limit (PQL) highlighted in bold.
4. Highest concentration detected in well during year.

No VOCs have been historically detected in the background wells for the site or in sidegradient well C-13. Time series plots of VOC monitoring data since 1996 do not indicate any clear trends in any of the wells.

45. Given that the Dellar Landfill accepted MSW and is unlined, it appears likely that one or more of the VOCs detected in the monitoring wells directly down gradient of the site (i.e., C-14, D-18, and D-19) came from the Dellar Landfill. The extent to which VOCs detected in other wells in the area (e.g., D-20) may have emanated from the Dellar Property, other unclassified units in the historical fill area, or the 28th Street Landfill, is unknown. Further, no VOC sampling of landfill or soil gas has ever been conducted in these areas, so that there is no direct evidence of LFG migration from the Dellar Property. The City claims that the offsite VOCs impacts detected south (D-19) and southwest (D-20) of the Dellar Property are legacy impacts from one or more industrial facilities formerly located near the area (e.g., vehicle dismantler, dry cleaner, salvage yard), not the Dellar Property. No investigation has ever been conducted to substantiate these claims, however.
46. The RWD indicates that the City of Sacramento will be providing groundwater monitoring data obtained from monitoring required by the 28th Street Landfill WDRs such that separate monitoring of the Dellar Landfill wells will not be necessary. The MRP in these WDRs allows the Discharger to obtain the monitoring data through either direct monitoring under these WDRs or by timely acquisition of data already collected by the City of Sacramento for the relevant monitoring period under the 28 Street Landfill WDRs. See MRP Sections A and D.

WATER QUALITY PROTECTION STANDARD

47. The landfill does not currently have an approved Water Quality Protection Standard (WQPS) Report or list of concentration limits. Further, the WQPS proposed in the RWD is not currently approvable for several reasons. For example, the RWD proposes to use well C-13 as the background well at the site for development of concentration limits. As noted in Finding 40, well C-13 is subject to gradient reversals during the dry season and is down gradient or side gradient of waste during these periods. The well also shows strong evidence of an historical release from the landfill. See Findings 42 and 43. Well C-13 is therefore not an appropriate well for background monitoring. See Standard Monitoring Specification I.26, SPRR. Absent approval of alternative background monitoring locations in the Water Quality Protection Standard Report submitted under Provision J.6.d, the MRP of these WDRs specifies wells B-4 and/or C-15 as background monitoring wells for the site because they are closer to the river and less subject to being degraded by gradient reversals during the dry season.

48. In addition, the site does not currently have a shallow monitoring well along the down gradient perimeter of the landfill (Point of Compliance). Such a well is needed to satisfy the performance standards for detection and corrective action monitoring per Standard Monitoring Specification I.27 and WDR Monitoring Specification G.9. These WDRs therefore require submission of a work plan for the installation of a Point of Compliance well on the southwest perimeter of the landfill. See Provision J.6.a. After development of concentration limits and installation of the new Point of Compliance well under this Order, the WDRs further require that the Discharger submit a WQPS Report for the Dellar Landfill consistent with the requirements of this Order. See Provision J.6.d.

Monitoring Data Analysis Methods

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

51. For a naturally occurring constituent of concern, the Title 27 requires concentration limits for each constituent of concern be determined as follows:
 - a. By calculation in accordance with a statistical method pursuant to Title 27, section 20415(e)(8); or
 - b. By an alternate statistical method meeting the requirements of Title 27, section 20415(e)(8)(E).

52. Title 27 specifies the prescriptive requirements and performance standards applicable to monitoring data analysis and requires that such methods be implemented as follows:
 - a. As specified in the existing MRP under the WDRs; or
 - b. In accordance with a technical report (certified by an appropriately registered professional) documenting such methods, submitted to, and approved by, the Central Valley Water Board; or
 - c. In accordance with any water quality data analysis software deemed appropriate for such use by either the Central Valley Water Board or SWRCB.

The MRP of these WDRs requires that concentration limits for naturally-occurring constituents be based on an interwell approach absent a satisfactory demonstration that an intrawell approach is justified at the site (e.g., existence of significant spatial variability not attributable to a release from the unit). As proposed in the RWD, the MRP specifies that the method of interwell Tolerance Limits be used to calculate concentration limits for naturally-occurring constituents at the site. For evaluation of corrective action progress (i.e., trends), the monitoring program specifies an intrawell statistical procedure (e.g., Sens Slope Method). See Section C.4., MRP.

53. To demonstrate that corrective action has been completed (i.e., concentrations along Point of Compliance returned to compliance with the water quality protection standard), Monitoring Specification G.11 specifies a four year "proof" period. During this period, the Discharger must demonstrate that all constituents of the release have been reduced to concentration limits for at least eight consecutive semiannual monitoring events.

LANDFILL OPERATIONS

54. Waste filling on the Dellar Property is reported to have consisted of the discharge to deep borrow pits on the east half of the site, trench and fill operations on the west half of the site, and area fill operations over the entire site. Based on the maximum estimated elevation of waste after the landfill was filled in 1963 (about 41 feet MSL) compared to undeveloped grade offsite to the west (30 feet MSL), it is estimated that area fill operations constituted up to 10 feet of the landfill waste column. See June 1987 SWAT Report (*28th Street Landfill Calderon Report*, prepared by the City of Sacramento Department of Public Works), Page 46. It is unknown whether, or to what degree, waste was compacted in these operations. Stockpiled soil excavated from the pits and trenches was used as operational cover soil.

55. Accounting for estimated settlement during the 60 year inactive period prior to closure in 2012, it is likely that the average height of the landfill column was about 25 feet on the western half of the landfill and 45 feet on the eastern half of the landfill when the landfill was abandoned in 1963.⁶ Based on the estimated waste column thickness described in Finding 54, the average depth of waste below natural grade would have been about 15 feet bgs (15 feet MSL) on the western half of the unit and 35 feet bgs (5 feet MSL) on the eastern half of the unit. It is therefore likely that waste was discharged below the high water table in some portions of the site. Such operations could possibly have been conducted during periods of low groundwater (e.g. late dry season) or if the borrow pits were pumped for de-watering purposes.

LANDFILL DESIGN AND CONSTRUCTION

56. As a "closed, abandoned, or inactive" (CAI) unit under Title 27 regulations, the landfill predated current regulatory standards for waste containment and was constructed without a base liner (e.g., compacted clay liner) or LCRS. Further, given that disposal operations consisted primarily of trench fill and disposal to deep borrow pits, it is unlikely that the base of the landfill was engineered (i.e., compacted and graded) prior to initiating waste disposal. The landfill containment system was therefore limited to side wall berms consisting of the American River levee to the north; the A Street Road embankment to the south, and berms constructed on the east and west sides of the site using soil excavated from the trenches and pits. The latter berms were constructed to a height of about 11 feet above surrounding grade.
57. Information on file indicates that the landfill top deck grade would have been relatively flat (e.g., <0.5% grade) with an average top deck elevation of about 41 feet MSL.⁷ The interior slopes of the surrounding containment berms/levees were about 3H:1V. The landfill side slope grades above the top of the containment berms are unknown. Below ground surface, the interior slopes consisted of the walls of the trenches and pits excavated during landfill construction.⁸

6. Results based on 1988 geotechnical investigation to assess the feasibility of extending Richards Avenue through the historical fill area, including the Dellar Property. As part of this investigation, four soil borings were installed along the southern portion of the Dellar Property, including two on the western half and two on the eastern half. Results indicated waste depths up to 22 feet on the western half of the property 62 feet bgs on the eastern half of the property. See 1988 *Geotechnical Investigation, Richards Boulevard Extension*, prepared by Harding Lawson Associates; 1991 *Final Environmental Impact Report, Sutter's Landing Park and Richard's Connector Between 28th Street and the Union Pacific Railroad Tracks*, prepared by STA Planning, Inc. (Page 181).

7. There is no topographic survey information on file dating back to when the landfill was abandoned, however, language in the 1957 operating agreement between the City and the property owner indicates a plan to fill up to the level of an imaginary line drawn from the top of the American River levee to the north (about 43 feet MSL) to the top of the Southern Pacific Railroad track embankment to the south (about 39 feet MSL).

8. Language in the 1957 operating agreement between the City and property owners authorized the City to excavate disposal pits on the property and use the excavated soil to construct side wall levees to buttress

INACTIVE PERIOD

58. Reports on file indicate that upon cessation of landfill operations in 1963, the landfill was left with uncompacted soil cover of varying thickness and that it did not receive an engineered final cover (i.e., was not capped and graded for drainage). It is unknown whether the cover met then-existing regulations (if any) for landfill closure, or whether the landfill was abandoned. In either case, such cover would not have met current regulatory standards under Title 27 regulations.
59. A conceptual closure plan for the Dellar Property was included in an amendment to the Final Closure Plan for the 28th Street Landfill, but never finalized or implemented. The conceptual plan envisioned grading the landfill for drainage and installation of an engineered soil cover on the landfill. See December 1995 *Final Closure Plan Amendment No. 2 City of Sacramento 28th Street Sanitary Landfill*, prepared by Harding Lawson Associates.
60. Central Valley Water Board staff inspections conducted at the Dellar Property between 1992 and 2005 (e.g., 28 September 1992, 16 January 2002, 6 February 2003, 27 May 2004, and 2 June 2005) confirmed historical information on file indicating that the landfill cover was not adequate and that the site had been abandoned. These inspections typically found that the landfill cover surface was hummocky from long term differential settlement, had desiccation cracks, and/or that it did not adequately drain. Several inspections found ponded storm water on the landfill surface and likely storm water infiltration into landfill wastes.
61. A 2003 Phase I Site Assessment conducted by a prospective purchaser of the property also found that the site had been abandoned and was not adequately drained. The report from the study recommended that the landfill be closed as a corrective action measure; a follow-up (Phase II) assessment as to of the nature and extent of any landfill impacts; and LFG testing. See July 2003 *Phase I Environmental Site Assessment Report*, prepared by SCS Engineers. A 2004 site assessment by the property owner made similar findings and recommendations, but asserted that the City was the sole responsible party for the recommended work. See December 2004 *Site Summary Report, 28th Street Landfill (Dellar Properties)*, prepared by Alisto Engineering Group.
62. The landfill also had a history of subsurface fires during its inactive period dating back to the mid-1980s. Such fires may have been attributable to trespass or spontaneous combustion associated with the waste decomposition process. Such conditions may have constituted a nuisance under the Water Code.

wastes and as final cover material. Historical aerial photos and site topographical surveys confirm that the sidewall containment berms were constructed and still exist on the property.

CORRECTIVE ACTION

63. Title 27, section 20080(g) states:

“CAI Units—Persons responsible for discharges at Units which were closed, abandoned, or inactive on or before November 27, 1984 (CAI Units), may be required to develop and implement a detection monitoring program in accordance with Article 1, Subchapter 3, Chapter 3, Subdivision 1 of this division (section 20380 et seq.). If water quality impairment is found, such persons may be required to develop and implement a corrective action program under that article.”

On 13 March 2003, Regional Water Board staff issued a letter to the property owner (Sylvia Dellar Survivor's Trust) noting that the landfill was a CAI under Title 27, section 20080(g) and that monitoring data collected by the City of Sacramento showed evidence of groundwater impacts from the landfill, including VOCs and elevated inorganic constituents. The letter requested that the Discharger submit a Corrective Action Plan (CAP) to address the impacts. A 13 June 2003 due date for submission of the CAP was ultimately extended to 2 September 2003, but the CAP was never received.⁹

64. On 4 June 2008, the Water Board's Executive Officer issued Cleanup and Abatement Order (CAO) No. R5-2008-0705 to the Discharger (Sylvia Dellar Survivor's Trust and City of Sacramento), requiring that the Discharger submit a plan for closure of the landfill as a corrective action measure under Title 27 regulations (i.e., sections 20080(g) and 20430). The CAO required that the Discharger:

- a. Submit a final closure plan for approval by 15 March 2008;
- b. Begin landfill closure construction by 1 June 2012;
- c. Complete closure construction by 30 October 2010; and
- d. Submit a final certification report by 15 December 2010.
- e. Obtain coverage under the Construction Activities General Storm Water Permit prior to initiation of closure activities and submit and implement an erosion control plan for the project.

As described in Finding 79, the Central Valley Water Board ultimately issued an Administrative Civil Liability Order to the Discharger for failing to meet project milestones under the CAO, including various due dates for submission of technical reports and completing closure construction activities.

LANDFILL CLOSURE

65. Prior to initiating landfill closure construction in 2011, the landfill surface elevation averaged about 38 feet above mean sea level (MSL), about 8 feet above natural grade to the southwest. The western side of the landfill had a 10H:1V slope, except along its north end, where it steepened to 4H:1V. The northern side slope was contiguous with

⁹. Records on file indicate that after receiving the Water Board directive, the property owner sued the City seeking a determination that the City be declared primarily responsible for compliance with Water Board orders regarding the landfill and indemnification for claims arising from operation of the landfill.

the interior slope of an old, dry sedimentation pond on the adjacent (California Almond Growers Exchange) property, the bottom of which was about 18 feet MSL.

66. Title 27 does not specify prescriptive closure requirements for an unclassified landfill. However, for CAI units, landfill closure can be required as part of a corrective action program to address water quality impairment associated with a release from the unit. See Title 27, section 20080(g). Additionally, CWC Section 13360(a)(1) allows the Regional 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.
67. On 29 October 2009, the City of Sacramento submitted a Final Closure and Postclosure Maintenance Plan (October 2009 FC/PCMP) for the landfill, including a design report, in response to the CAO. Central Valley Water Board staff subsequently approved the plan on 9 December 2009. The October 2009 FC/PCMP was never implemented, however, due to discovery of Elderberry bushes at the site during a pre-construction biological survey conducted by U.S Fish & Wildlife Service (USFWS) staff. Elderberry bushes are a known habitat for the Elderberry Beetle, a federally protected species. Grading of the landfill top deck under the City's plan would have included removal of the Elderberry bushes and destruction of this habitat. The USFWS subsequently informed the City that the City would need to prepare a full Habitat Conservation Plan (HCP) and obtain USFWS approvals prior to initiating project construction.

2011 Partial FC/PCMP

68. To avoid the need to obtain project approvals from the USFWS, a process that could take several years if a full HCP was needed, the Discharger (property owner) subsequently submitted a 22 July 2011 Closure and Post-Closure Maintenance Plan, Dellar Trust Property, prepared by Kleinfelder West, Inc. (2011 partial FC/PCMP) that included plans to work around the Elderberry bush issue. The changes incorporated into the 2011 partial FC/PCMP are summarized in the Information Sheet. The revised work scope included, but was not limited to, the following activities:
 - a. Site Preparation
 - i. Completion bid documents and selection of a construction contractor;
 - ii. Demolition and clearing;
 - iii. Importation and stockpiling of soil;
 - iv. Improvement of central access road;
 - v. Radio transmission tower and power pole repairs/improvements; and
 - vi. Abandonment of an inactive agricultural well.
 - b. Landfill Closure
 - i. Excavation of two detention basins in landfill footprint;
 - ii. Relocation of excavated wastes;

- iii. Installation of the detention basins and associated facilities (e.g., pump vaults, plumbing, electrical lines, access ramps) for storm water collection and discharge;
 - iv. Grading and placement of final cover;
 - v. Installation of cover swales and other drainage controls; and
 - vi. Establishment of vegetative cover.
- c. Project Schedule
- i. Complete site preparation by September 2011;
 - ii. Complete closure work by September 2012.

69. The 2011 partial FC/PCMP proposed installation of a non-prescriptive, engineered soil cover over the landfill (except for the Elderberry Bush, levee corridor, transmission tower, and detention basin areas) as follows, from top to bottom:

- a. Vegetative cover – Native grass mix;
- b. Engineered soil layer – 2 feet of compacted fill soil;
- c. Foundation layer -- 1 foot of existing cover soil and/or waste.

Approximately 90,000 cubic yards of cover soil, most of which was stockpiled either onsite or at the nearby 28th Street Landfill, would be used in construction of the cover. Additionally, approximately 4,000 cubic yards of lower permeability soil would need to be imported for detention basin construction. Closure of the transmission tower area would include demolishing the tower's existing concrete block base; pouring concrete in the void between the underlying support columns, which are footed in landfill waste; and once set, backfilling over the concrete to surrounding cover grade using compacted soil and other inert material (i.e., broken concrete, and/or aggregate). Additional project specifications were proposed for the lower portion of the eastern detention basin to reduce infiltration into underlying wastes. See Finding 73.d.ii.

Closure of the Elderberry bush areas would be deferred until such time as the Elderberry Beetle is delisted as a federally protected species so that the bushes could be removed. Closure of the levee corridor area was not addressed in the plan, which proposed that the cover terminate a horizontal distance of about 18 feet from the inland edge of the top of the American River levee (about 6 feet beyond the estimated base of the levee).

70. A technical report demonstrating the stability of the final cover slopes was included in the 2011 partial FC/PCMP consistent with Title 27, sections 21090(a)(6) and 21750(f)(5). The evaluation was limited to global analysis given that none of the final cover slopes exceeded 3H:1V and that the landfill is unclassified. East-west cross-sectional models were developed through each detention basin, given these areas of the cover had the steepest slopes (3H:1V) and with saturated conditions would likely have the most critical slopes. Final grading plan and site stratigraphy information were also used in developing the models. Materials parameters used in the analysis were

derived based on general site conditions and a limited number of soil borings installed as part of a 2011 geotechnical investigation of the proposed detention basin areas.

The analysis was conducted using Spencer's Method (GeoStudio 2007 software), which considers both force and moment equilibrium in failure analysis. Static and dynamic (pseudo-static) analysis was conducted on rotational slices through the 3H:1V eastern and western side slopes of each basin. A horizontal acceleration coefficient of 0.082g (equal to the estimated peak ground acceleration (0.204g) divided by 2.5) was used in the pseudo-static analysis. Results of the analysis indicated relatively stable slopes at each basin with estimated minimum static and dynamic safety factors of 1.7 and 1.3 occurring along the eastern slope of western detention basin.

71. After revisions in response to comments, on 7 September 2011, Central Valley Water Board Compliance Unit staff approved the 2011 partial FC/PCMP as an acceptable corrective action under the 2008 CAO. Site preparation work was completed by the end of June 2012 and landfill closure activities began in early July 2012.

2012 Closure Construction

72. The landfill final cover was graded to form a north-south central spine with broadly-sloping east and west flanks extending to the top of the sidewall berms. The flanks were graded to a 3% slope, except in the Elderberry bush (flatter) and detention basin (steeper) areas. Final cover elevations ranged from 47 feet MSL along the landfill spine to 42 feet MSL along the western side of the unit and 40 feet MSL along the northern, southern, and eastern sides of the unit. The southern perimeter of the final cover extended to the A Street embankment (as did underlying waste), while the northern portion perimeter of the landfill cover extended to the southern edge of the NCZ. See Attachment C.
73. Detention basins and associated facilities were also constructed within the landfill unit as part of the landfill's precipitation and drainage controls. The detention basins were generally constructed as follows:
 - a. Dimensions -- 350 feet long, 250 feet wide, and 16 feet deep.
 - b. Elevation Range - 24 feet MSL (base) to 40 feet MSL (rim)
 - c. Grading – 3H:1V interior side slopes.
 - d. Cover Construction
 - i. Western Basin
 - 1) Base and side slopes
 - A. 2 feet thick
 - B. Soil – stockpiled cover soil, 90% relative compaction¹⁰

¹⁰. Low permeability soil not specified for the western detention basin because infiltration into underlying materials less of a concern (underlying wastes removed prior to construction).

- 2) Foundation layer – native soil
 - ii. Eastern Basin
 - 1) Base and lower side slopes
 - A. 4 feet thick
 - B. Soil – clayey sand; low plasticity index ($8 \leq PI \leq 30$); low liquid limit ($LL < 45$); 30% passing #100 sieve.¹¹
 - 2) Upper side slopes (beginning 4 feet above base)
 - A. 2 feet thick
 - B. Soil - stockpiled cover soil, 90% relative compaction
 - 3) Foundation layer – landfill waste
 - e. Erosion Control
 - ii. Western Detention Basin -- Geosynthetic erosion control blanket placed on bottom and adjacent side slope where culvert discharges into the basin
 - iii. Eastern Detention Basin -- Rip rap erosion control apron placed on bottom of basin at culvert discharge point.
 - f. Plumbing –Prefabricated pump vaults, each equipped with two, remotely-activated pumps, were installed in each basin for pumping the basins. Both vaults were plumbed to the City's combined sewer system and wired to the City's SCADA system for operational control.
74. A shallow, rectangular drainage channel was constructed adjoining southern end of each basin to capture sheet flow runoff not flowing directly into the basins. These drainage channels were generally constructed as follows:
- a. Dimensions -- 150 feet long, 7 feet wide at the top, 4 feet wide at the base, and 1.5 feet deep;
 - b. Elevation Range – 30 feet MSL (base) to 42 feet MSL (rim)
 - c. Grading - Base graded 10H:1V toward detention basin, interior side slopes graded to 1H:1V.
 - d. Cover construction
 - i. Base and side slopes
 - 1) 2 feet thick
 - 2) Soil - stockpiled cover soil, 90% relative compaction
 - ii. Foundation layer – landfill waste

¹¹. Soil specifications for the eastern detention basin intended to reduce the potential for infiltration into underlying wastes. Such soil would have a relatively low permeability (e.g., $k < 10^{-4}$ cm/sec), but be more resistant to desiccation cracking than clay soil.

- e. Erosion Control/Access – Entrance to both channels lined with 4-inch layer of compacted Class 3 aggregate to serve as vehicle access road for basin maintenance.
 - f. Plumbing -- Western channel fed by V-shaped cover swale constructed to intercept sheet flow runoff from southern area of landfill.
75. The landfill cover was graded to drain in approximate quadrants, as follows:
- a. Northeast Quadrant (7.9 acres) – Drained by several unlined cover swales plumbed to the eastern detention basin via a drop inlets and culverts.
 - b. Southeast Quadrant (5.3 acres) – Drained by direct flow, and eastern drainage channel discharge into, the eastern detention basin.
 - c. Northwest Quadrant (5.8 acres) – Drained by direct flow, and cover swale discharge into, the western detention basin.
 - d. Southwest Quadrant (4.9 acres) – Drained by western drainage channel flow into the western detention basin.
76. All landfill drainage facilities, including cover swales, drop inlets, overside drains, perimeter ditches, culverts, and the storm water pond were designed to have sufficient capacity to accommodate a 24-hour, 100-year storm event.
77. On 26 October 2012, the Discharger submitted a Closure Certification Report (26 October 2012 *Construction Quality Assurance Report, Dellar Trust Property Closure*, prepared by Kleinfelder) documenting the site preparation and closure activities implemented in 2012 under the 2011 approved partial FC/PCMP. The following modifications to the closure design implemented during project construction:
- a. The final cover elevation was raised one foot to achieve a better balance between cut and fill (i.e., to accommodate the expansion volume of waste excavated during grading and excavation of the detention basins). The elevation of the sedimentation basins was raised two feet for the same reason.
 - b. The northern extent of the final cover was reduced an additional 16.8 feet to avoid the need for an encroachment permit from the American River Flood Control District (ARFCD), a process that could take several months and significantly delay the project.¹² The resulting 35-foot setback from the levee (referred to as the “No Construction Zone”), increased the area within the levee corridor not receiving final cover compared to the 2011 approved partial FC/PCMP. See Information Sheet.
 - c. Various plumbing improvements (e.g., drop inlets, swales) installed along the northeast, northwest, and Elderberry bush areas of the site to ensure these areas

¹². The ARFCD, which has jurisdiction over the levee, expressed concern that extension of the landfill cover to the levee and project construction within the levee corridor area could adversely affect the structural integrity of the levee.

are adequately drained.

- d. Installation of Supervisory Controls and Data Acquisition (SCADA) system controls for operation of detention basin pumps.
78. The total as-built cost of landfill closure, including site preparation, cover, detention basins, and other improvements, was about \$4 million in 2013 dollars. Approximately \$720,000 of the total cost was paid for using CalRecycle grant money awarded to the City for closure of the Dellar property in December 2011.
79. Notwithstanding the closure construction activities completed under the 2011 partial FC/PCMP, on 6 December 2013, the Central Valley Water Board adopted Administrative Civil Liability (ACL) Order No. R5-2013-0154, fining the Discharger \$148,904 for failing to comply with schedules in CAO R5-2008-0705 for submission of technical documents and landfill closure construction. The Sylvia Dellar Survivor's Trust and the City of Sacramento each subsequently paid half of the fine (\$74,442). The Water Board's compliance unit subsequently referred the Dellar Landfill to the Water Board's Title 27 permitting unit to prepare waste discharge requirements for the facility.

Levee Corridor Area

80. On 3 June 2014, Central Valley Water Board staff issued tentative waste discharge requirements (June 2014 tentative WDRs) for the Dellar Landfill, including proposed requirements for closure of the remaining areas of the landfill footprint (i.e., levee corridor and Elderberry Bush areas). The June 2014 tentative WDRs generally required construction of the engineered soil cover design approved under the 2011 partial FC/PCMP (see Finding 69), but allowed the discharger to propose an alternative cover design (including the existing soil cover) if the Discharger could demonstrate its equivalency to the approved cover design.
81. In response to the June 2014 tentative WDRs, the Discharger commented that the existing soil cover in the levee corridor area was adequately protective of water quality and that the proposed requirement for construction of soil cover in that area was unreasonable and should be removed from the WDRs. After discussions with the Discharger, it was agreed that the tentative WDRs would be put on hold to allow the Discharger sufficient time to make a demonstration as to the adequacy of the existing soil cover in the levee area. In a 24 October 2014 letter, Water Board staff informed the Discharger that a field investigation of the levee corridor area would be needed to characterize the nature and extent of the cover soil and waste. The letter requested that the Discharger submit the alternative closure design demonstration results as an addendum to the 2012 Closure Certification Report by 5 December 2014.
82. On 30 January 2015 (consistent with a due date extension approved by Board staff), the Discharger submitted the requested addendum to the 2012 Closure Certification Report. The report indicated that the in-place specifications of existing soil cover in the levee

corridor area (e.g., soil type, compaction, density) were substantially equivalent to the final cover installed on the main part of the landfill and that the underlying waste was inert.¹³ The report recommended that the levee corridor area be considered closed without any additional cover construction. Water Board staff concurred with the report's findings and recommendations, and in a 12 February 2015 letter, acknowledged that the levee corridor area had been closed.

Elderberry Bush Areas

83. Given the above demonstration as to the adequacy of existing cover in the levee corridor area, the only portions of the landfill not yet closed are the Elderberry Bush areas. These areas, most of which are on the eastern half of the site, collectively comprise less than one acre of the landfill footprint. See Attachment C. These WDRs require that the Discharger submit a revised FC/PCMP that includes plans for closing these remaining areas of the landfill. See Closure and Postclosure Specification E.1.b and Provision J.7.a.

POSTCLOSURE MAINTENANCE

84. The approved 2011 partial FC/PCMP did not address post-closure maintenance of the levee corridor and Elderberry Bush areas) nor issues associated with the closure design modifications implemented during project construction in 2012 (e.g., connection of the detention basin pump system to the City's SCADA network). The PCMP also did not include plans for gas and groundwater monitoring based on an assumption that the landfill is not generating significant amounts of LFG and has not caused any significant groundwater impacts.

These WDRs require that the postclosure maintenance and monitoring plan submitted as part of the amended FC/PCMP required under this Order be consistent with the existing as-built cover design, plans for closure of the remainder of the landfill, and postclosure monitoring requirements under these WDRs. See Closure and Postclosure Maintenance Specification E.1.c.i.

FINANCIAL ASSURANCES

85. Title 27 does not require the operator of an unclassified landfill to provide financial assurances for closure, postclosure maintenance, and/or corrective action. See Sections 22205(b), 22210(b), 22207(a), 22220(b) and 22222.

CEQA AND OTHER CONSIDERATIONS

86. The action to adopt WDRs is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21000, et seq.), in accordance with Title

13. Five soil borings were installed at representative locations within the levee corridor area to characterize the existing soil cover and extent and nature of underlying waste. Construction Quality Assurance (CQA) was also conducted to determine in-place specifications. Small pockets of inert debris (glass and metal) were found in two borings closest to the main landfill footprint, while the other borings indicated clean soil.

14, CCR Section 15301 for existing facilities.

87. 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 proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of discharging, or who proposes 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."
88. The technical reports and monitoring and reporting program required by this Order 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.
89. This Order implements:
- The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition;*
 - Chapters 1 through 7, Subdivision 1, Division 2, Title 27, of the California Code of Regulations, effective 18 July 1997, and subsequent revisions;*
 - The Porter-Cologne Water Quality Control Act, Division 7, California Water Code.*
 - State Water Resources Control Board Resolution No. 68-16, Statement of Policy With Respect to Maintaining High Quality of Waters in California.*
90. Facilities under WDRs are classified for the purposes of determining the annual permit fee and WDR update cycle. These classifications are based on threat to water quality and complexity associated with the discharge. The Dellar Landfill is classified as a "2C" discharge under these WDRs. The following fee criteria were used:

Threat to Water Quality:

Category "2" – Those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short-term violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance.

Complexity:

Category "C" – Any discharger for which waste discharge requirements have been prescribed pursuant to Section 13263 of the Water Code not included in Category A or Category B as described above. Included are dischargers having no waste treatment systems or that must comply with best management practices, dischargers having passive treatment and disposal systems, or dischargers having waste storage systems with land disposal.

The WDR update cycle for 2C discharges is 10 years from the date of adoption of the WDRs, or, if granted a continuance by the Executive Officer, from the continuance date. The WDR fee schedule may be found on the Central Valley Water Board's website at:

http://www.waterboards.ca.gov/resources/fees/docs/fy14_15_fee_schedule_wdr.pdf

PROCEDURAL REQUIREMENTS

91. The Regional Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
92. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.
93. Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and title 23, CCR, sections 2050 et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of the Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

or will be provided upon request.

IT IS HEREBY ORDERED, pursuant to Sections 13263 and 13267 of the California Water Code, that the City of Sacramento Department of Utilities and Sylvia Dellar Survivor's Trust, their agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

A. DISCHARGE PROHIBITIONS

1. The discharge of non-inert waste to the landfill unit, including wastes defined as "hazardous", "designated" or "nonhazardous", as defined under Title 27, is prohibited.
2. The discharge of new or additional waste to the landfill unit, or any portion thereof, is prohibited, except for the following:
 - a. Solid wastes being relocated within the landfill unit to establish the final cover grade prior to closure of the unit or a portion thereof;
 - b. The beneficial reuse of inert materials in landfill cover construction or repair

- (e.g., foundation layer, side slope buttresses, berms) consistent with Discharge Specifications B.2.a and B.2.b;
- c. The stockpiling of inert materials for beneficial reuse as described in Discharge Prohibition A.2.b;
 - d. The beneficial reuse of inert liquids consistent with Discharge Specification B.2.c; and
 - e. The temporary storage of storm water collected in onsite detention basins consistent with the approved Operations and Maintenance (O&M) plan for the facility required under Storm Water Specification I.5.
3. Except for storm water as noted above, the discharge of solid or liquid wastes (e.g., MSW, litter, and construction and demolition debris) to either of the two onsite detention basins is prohibited.
 4. Any lateral or vertical expansion of the existing landfill footprint is prohibited.
 5. The discharge of waste within 100 feet of surface waters is prohibited.
 6. The discharge of solid or liquid wastes, or waste constituents, to the unsaturated zone and/or groundwater is prohibited.
 7. The discharge of solid or liquid wastes (e.g., MSW, leachate, groundwater, storm water) to surface water, or to any surface water drainage courses, is prohibited absent an NPDES permit authorizing the discharge.
 8. The landfill shall not cause pollution or nuisance or the degradation of any water supply. See Terms and Conditions B.1 and Standard Discharge Specification D.5, SPRR.
 9. The Discharger shall comply with all Standard Prohibitions applicable to a closed/inactive, unlined MSW landfill listed in Section C of the SPRRs.

B. DISCHARGE SPECIFICATIONS

1. The discharge shall remain within the designated disposal area (i.e., landfill unit) at all times. Any solid waste from the landfill found outside of the landfill unit, either onsite or offsite, shall be removed and disposed of at an authorized offsite facility.
2. The discharge/beneficial reuse of inert wastes within the unit under Discharge Prohibition A.2 shall be subject to the following restrictions:
 - a. Inert wastes used in construction or repair of landfill final cover shall meet project specifications contained in the approved construction documents described in, or submitted under, this Order and be applied consistent with the

revised FC/PCMP submitted under this Order. See Construction Specifications F.6 and F.12.

- b. Only clean soil (i.e., soil not containing any waste) may be used in the construction/repair of the vegetative cover layer, engineered soil layer, sideslope buttresses/berms, detention basin walls, and cover drains.
 - c. Inert liquids (i.e., 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).
3. The Discharger shall comply with all Standard Discharge Specifications applicable to an inactive, unlined MSW landfill listed in Section D of the SPRRs.

C. FACILITY SPECIFICATIONS

1. The Discharger shall maintain a copy of this Order at the facility or designated field office (Solid Waste Office, City of Sacramento 28th Street Corporation Yard) and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.
2. Pursuant to Title 27, section 21760(b), the Discharger shall develop and implement approved Operations and Maintenance (O&M) plans for all landfill control systems that could affect water quality, including, but not necessarily limited to, storm water (see Storm Water Specification I.5) and, if necessary based on the results of the investigation conducted under Corrective Action Specification D.5.
3. The Discharger shall comply with all Standard Facility Specifications applicable to a closed/inactive, unlined MSW landfill listed in Section E of the SPRRs.

D. CORRECTIVE ACTION SPECIFICATIONS

1. The Discharger shall implement landfill closure as a corrective action at the site as necessary to achieve the following goals:
 - a. Remediate the existing release to groundwater from the landfill;
 - b. Return to compliance with the Water Quality Protection Standard; and
 - c. Prevent future groundwater impacts and/or degradation associated with a release from the landfill.

See Title 27, sections 20080(g) and 20430(c).

2. The Corrective Action Plan for the landfill shall include the revised FC/PCMP submitted under Closure and Postclosure Specification E.1, and any subsequent amendments or revisions thereto, as approved by the Executive Officer.

3. Any engineered alternative final cover design proposal submitted under Construction Specification F.4 less stringent than the approved design under Construction Specification F.3 shall include the following demonstration:
 - a. That construction of the approved design under Construction Specification F.3 is not feasible based on the criteria set forth in Title 27, section 20080(c);
 - b. That the proposed engineered alternative design meets the performance standards for landfill closure as a corrective action listed in Corrective Action Specification D.1;
 - c. That the wastes underlying the proposed area are inert by their nature or otherwise not a threat to groundwater water quality; and
 - d. Evidence that the proposed design complies with any outstanding enforcement order for the site issued by the Central Valley Water Board or its Executive Officer and the requirements of other agencies with jurisdiction over the project.
4. Methane and other landfill gases, if present at levels of regulatory concern, shall be adequately vented, removed from the Unit, or otherwise controlled to prevent the danger of adverse health effects, nuisance conditions, or the impairment of the beneficial uses of surface water or groundwater due to migration through the unsaturated zone.
5. By **15 July 2015**, the Discharger shall submit a work plan for the installation of in-situ gas monitoring probes within the landfill unit to investigate whether the landfill is generating LFG and the possible need for LFG controls. A sufficient number of probes (temporary or permanent) shall be installed at representative locations and depths to make this determination. Monitoring of the probes shall be conducted for **at least one year** in accordance with the schedule in the MRP under this Order. See Provision J.7.a.
6. If the results of the in situ gas investigation required under Corrective Action Specification D.5 indicate the presence of LFG that could impact or threaten groundwater at the site, the Discharger shall submit a corrective action work plan to address LFG issues at the site for Water Board staff approval. The work plan shall include the following elements:
 - a. A plan for installation of soil gas corrective action monitoring probes to define the extent of LFG migration;
 - b. A design report for the installation of LFG controls (passive or active), as warranted to remediate the gas release; and
 - c. A plan to monitor the effectiveness of the LFG controls as a corrective action measure.

Implementation of the above work plan shall be in accordance with the schedule provided in Provision J.7.

7. Installation, repairs, or modifications to LFG control systems, whether passive or active, shall be conducted so as not to damage landfill cover or expose landfill waste to the elements.

E. CLOSURE AND POSTCLOSURE SPECIFICATIONS

1. By **15 January 2016**, the Discharger shall submit revised Final Closure and Postclosure Maintenance Plan (FC/PCMP) for the landfill that describes/addresses the following items:
 - a. Existing Closed Areas
 - i. Modifications to the closure design implemented during 2012 project construction (see Finding 77);
 - ii. References to as-built documents/certification reports;
 - iii. The approved cover performance demonstration for the levee corridor area (see Finding 82);
 - b. Areas Not Yet Closed
 - i. A plan and schedule for closing the Elderberry Bush areas of the landfill, including, but not necessarily limited to:
 - (1) A proposed final cover design;
 - (2) A corrective action performance demonstration under Corrective Action Specification D.3 for any engineered alternative cover design less stringent than that specified in Construction Specification F.3; and
 - (3) A list of tasks and project schedule consistent with Provision J.8.
 - c. Landfill Postclosure Maintenance and Monitoring
 - i. An amended postclosure maintenance and monitoring plan for the partially-closed landfill (see E.1.a above) consistent with the monitoring schedules in the MRP; and
 - ii. An O&M plan for the detention basin and associated facilities per Storm Water Specification I.5.
2. The Discharger shall close the remaining areas of the landfill (i.e., Elderberry bush areas) in accordance with the revised FC/PCMP submitted above, as approved by the Executive Officer, and other requirements of this Order.
3. The final cover grade shall not be less than one percent in any area.
4. Final cover slopes shall not be steeper than a horizontal to vertical ratio of three to

one consistent with the revised FC/PCMP.

5. Any drainage layer in the final cover shall be designed and constructed to intersect with the final drainage system for the waste management unit in a manner promoting free drainage from all portions of the drainage layer [Title 27, section 20365(f)].
6. All landfill precipitation and drainage control systems shall be designed, constructed, operated and maintained to:
 - a. Convey peak flows from a 100-year, 24-hour storm event; and
 - b. Accommodate the anticipated volume of precipitation and peak flows from surface runoff under 100-year, 24-hour event conditions.
7. The landfill closure units shall be designed, constructed, and maintained to prevent inundation or washout due to floods with a 100-year return period [Title 27, section 20250(c)].
8. The landfill cover shall be designed, constructed, and maintained to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, and washout under the precipitation conditions for the unit [Title 27, section 20365(a)].
9. With the exception of storm water discharged to the onsite detention basins and connecting channels, the ponding of any liquid on the final cover of the landfill unit is prohibited.
10. Following closure of the MSW landfill unit, the Discharger shall notify the Executive Officer that the deed to the landfill facility property, or some other instrument that is normally examined during a title search, has been recorded and a copy placed in the operating record. The notation on the deed shall in perpetuity notify any potential purchaser of the property that the land has been used as a landfill facility and that use of the land is restricted to the planned use described in the post-closure maintenance plan [Title 27 section 20515(a)(4) and section 21170].
11. The post-closure maintenance period shall continue until the Central Valley Water Board determines that wastes remaining in the landfill unit(s) no longer pose a threat to water quality [Title 27, section 20950(a)(1)].
12. The Discharger shall periodically inspect and identify problems with the final cover including areas that require replanting, erosion, areas lacking free drainage, areas damaged by equipment operations, and localized areas identified in the required five-year iso-settlement survey [Title 27, section 21090(a)(4)(B)].
13. The Discharger shall repair the cover promptly in accordance with a cover repair

plan to be included in the final post-closure maintenance plan [Title 27, section 21090(a)(4)(C)].

14. Throughout the post-closure maintenance period, the Discharger shall maintain the structural integrity and effectiveness of all containment structures, maintain the final cover as necessary to correct the effects of settlement and other adverse factors, maintain the monitoring systems, prevent erosion and related damage of the final cover due to drainage, and protect and maintain surveyed monuments [Title 27, section 21090(c)].
15. By **15 November 2017**, and every 5 years thereafter, the Discharger shall complete an aerial topographic survey of the landfill unit and immediate surrounding areas. The data so obtained shall be used to produce a topographic map of the site at a scale and contour interval sufficient to depict the as-closed topography of the Unit, and to allow the early identification of any differential settlement. [Title 27 section 21090(e)(1)]. A copy of the updated topographic map produced from each survey, and (beginning with the second survey after closure) an iso-settlement map depicting the estimated total change in elevation of the final cover's engineered soil layer shall be submitted as specified in the MRP of this Order. [Title 27, section 21090(e)(2)] See MRP, Section B.6.
16. Postclosure land uses at the site under this Order shall be limited to open space; landfill postclosure maintenance and monitoring; operation and maintenance of the unmanned radio transmission tower; and use of the river levee corridor by authorized persons under applicable laws and regulations. Any proposed change in postclosure use at the site shall comply with Title 27, section 21190, and must be approved by the Central Valley Water Board through revised WDRs.
17. The Discharger shall comply with all Standard Closure and Post-Closure Specifications applicable to a closed/inactive, unlined MSW landfill listed in Section G of the SPRRs. [Note: Standard Closure and Post-Closure Specifications specifically referring to a "Class II Unit" shall not apply to this facility.]

F. CONSTRUCTION SPECIFICATIONS

1. Construction activities conducted within the landfill area or affecting landfill facilities shall be limited to completing landfill closure, conducting necessary postclosure maintenance and repairs, or be related to an authorized postclosure use under this Order and Title 27 regulations.
2. For the purposes of this Order, provisions of Title 27 and the SPRR pertaining to containment structures, features, or systems; or to WMU design or construction, shall include landfill final cover unless otherwise indicated by the provision.

3. Except as provided in Construction Specification F.4, final cover over all portions of the landfill unit shall be constructed, maintained, and repaired in accordance with the following cover design, from top to bottom:
 - a. Vegetative cover – Native grass mix.
 - b. Engineered soil layer - Two feet of compacted fill soil
 - c. Foundation layer -- One foot of existing cover soil and/or inert waste.
4. The final cover design for portions of the landfill unit not yet closed (i.e., Elderberry Bush areas) shall, at a minimum, consist of either the approved design described in Construction Specification F.3 above, or an engineered alternative design meeting Title 27 corrective action goals demonstrated under Corrective Action Specification D.3 and included in the approved revised FC/PCMP submitted under Closure and Postclosure Specification E.1.b.
5. The materials used for the foundation layer shall have appropriate engineering properties for a foundation layer in accordance with Section 21090(a)(1). The foundation layer shall be engineered to minimize the potential for differential settlement so as not to affect the structural integrity of the final cover.
6. With the exception of the onsite detention basins and associated drainage channels described in Findings 73 and 74, the foundation and engineered soil layers of the final cover shall be constructed, maintained, and repaired in accordance with the following specifications or as otherwise specified in the revised FC/PCMP, as approved:
 - a. Foundation Layer
 - 1) Materials - stockpiled fill soil, existing cover soil, and/or underlying waste
 - 2) Particle Size – none
 - 3) Compaction -- 90% of maximum dry density
 - b. Engineered Soil Layer
 - 1) Materials – stockpiled fill soil
 - 2) Particle Size – none
 - 3) Compaction -- 90% of maximum dry density

The foundation and engineered soil layers for the detention basins shall be constructed, maintained, and repaired in accordance with the specifications listed in Findings 73 and 74.
7. The soil used in the vegetative cover layer shall support growth of the vegetative cover to the extent necessary to prevent erosion.
8. The Discharger shall ensure that the vegetative cover layer receives necessary seed, binder, and nutrients to establish the vegetation proposed in the Final Closure

Plan. The Discharger shall install necessary erosion and sedimentation controls to prevent erosion and sediment in runoff from the closed landfill during the period the vegetation is being established.

9. The vegetative cover layer shall be planted with native or other suitable vegetation so as to provide effective erosion resistance. Vegetative cover shall be:
 - a. Resistant to foreseeable adverse environmental factors (*e.g., climate, disease, and pests*);
 - b. Tolerant of the vegetative layer's soil conditions;
 - c. Germinate rapidly and have a high percentage of surface coverage;
 - d. Sufficiently persistent and self-propagating to prevent surface erosion; and
 - e. Compatible and harmonize with the proposed postclosure land use.
10. Final grading plans for closure of the landfill unit shall be prepared and approved by a registered civil engineer or certified engineering geologist [Title 27, section 21090(b)(1)(C)].
11. The Discharger may propose changes to the landfill cover design before or after construction, provided that approved components are not eliminated, the engineering properties of the components are not substantially reduced, and the proposed cover system results in the protection of water quality equal to or greater than the design prescribed by this Order. The proposed changes may be made following approval by the Executive Officer. Substantive changes to the design may need to be approved by the Regional Board.
12. At least 60 days prior to initiation of any closure construction activities under the revised 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. Any proposed design modifications pertaining to closure of the unit under Construction Specification F.11.
 - b. A construction design report, including project specifications, drawings, grading and design plans; and
 - c. A Construction Quality Assurance (CQA) Plan which satisfies the requirements of Section 20324 of Title 27 as it applies to the construction of the erosion-resistant and foundation layers.

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

13. A third party independent of both the Discharger and the construction contractor shall perform all of the construction quality assurance monitoring and testing during

closure construction of the landfill.

14. After completion of closure construction, the Discharger shall submit final documentation to the Executive Officer for review and approval in accordance with Section 20324(d)(1)(C) of Title 27. The report shall be certified by a registered civil engineer or a certified engineering geologist and shall contain sufficient information and test results to verify that construction was in accordance with the approved project plans and specifications, including the design report, CQA report, and Final Closure and Post-Closure Maintenance Plan. The Discharger shall also certify that closed landfill units shall be maintained in accordance with an approved postclosure maintenance plan [Title 27, section 21710(c)(6)].
15. Notwithstanding the 180-day timeline specified in Title 27, section 21880(c) for submission of closure certification reports, the Discharger shall submit these reports to the Central Valley Water Board within 60 days of completion of closure construction per Provision J.7.f. of this Order. The closure documents shall include a final CQA report and any other documents necessary to support the certification [Title 27, section 21880].
16. The Discharger shall comply with all Standard Construction Specifications applicable to a closed/inactive, unlined MSW landfill listed in Section F of the SPRRs. [Note: Standard Construction Specifications specifically referring to a "Class II Unit" shall not apply to this facility.]

G. MONITORING SPECIFICATIONS

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, and in accordance with the MRP and SPRRs.

Water Quality Protection Standard

2. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, including the MRP and the November 2013 SPRR incorporated by reference in Finding 2.e.
3. The concentrations of the constituents of concern in waters passing the Point of Compliance (defined pursuant to Title 27, section 20164 as a vertical surface located at the hydraulically downgradient limit of the landfill unit that extends through the uppermost aquifer underlying the unit) shall not exceed the concentration limits established pursuant to the MRP.
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 the MRP and the Standard Monitoring Specifications in Section I of the SPRRs.

Background Monitoring

5. The Discharger shall implement background monitoring for the unit consistent with Title 27, section 20415, including, but not necessarily limited to, subsections 20415 (b), (e)(6), and (e)(10).
6. Alternate Background Locations — The ground water monitoring system may include Background Monitoring Points that are not hydraulically upgradient of the Unit if the Discharger demonstrates to the satisfaction of the Central Valley Water Board that sampling at other Background Monitoring Points will provide samples that are representative of the background quality of ground water or are more representative than those provided by the upgradient Background Monitoring Points. See Title 27, section 20415(b)(2). The Executive Officer may approve of such proposals.

Detection Monitoring

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 SPRR Standard Monitoring Specifications I.37 through I.45.

Corrective Action

8. Corrective action monitoring shall be conducted for the purposes of monitoring the effectiveness of corrective action measures in returning to the Water Quality Protection Standard.
9. The Corrective Action monitoring program shall include a sufficient number of Monitoring Points installed at appropriate locations and depths to yield ground water samples from the uppermost aquifer that represent the quality of ground water passing the Point of Compliance and at other locations in the uppermost aquifer to provide the data needed to evaluate the effectiveness of the corrective action program. See Title 27, section 20415(b)(1)(D).
10. Corrective action monitoring shall include one or more of the following data analysis methods, as appropriate:
 - a. Statistical and nonstatistical data analysis methods used to quantify release;
 - b. Evaluation of trends associated with release
 - i. Statistical methods (e.g., least squares fit, Sens slope)
 - ii. Graphical methods (i.e., time series plots, comparison of concentration contour maps). and
 - c. Water quality chemistry analysis
11. Prior to termination of corrective action measures required under Section 20430(c), the discharger shall demonstrate, pursuant to Section 20430(f), that the constituents of the release have been reduced to levels below concentration limits throughout the entire zone affected by the release. During this “proof period”, the Discharger shall,

for each monitoring event, demonstrate that

- a. The concentration of each constituent at each monitoring point remained at or below its concentration limit for at least four years, beginning immediately after the suspension of active corrective action measures;
- b. The individual sampling events for each monitoring point were evenly distributed throughout the proof period and consisted of at least two semiannual sampling events per year per monitoring point; and
- c. At the end of the proof period, a single data analysis method (statistical or nonstatistical, as appropriate) was used for each monitoring parameter at each monitoring point to determine whether that parameter has been reduced to levels at or below concentration limits at that monitoring point.

The Discharger shall notify the Board and obtain Executive Officer approval prior to (1) suspending active corrective action measures prior to making the above demonstration; and (2) terminating active corrective action measures after making the above demonstration.¹⁴

12. 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 Regional Water Board.
13. The Discharger shall comply with all Standard Monitoring and Response to Release specifications applicable to a closed/inactive, unlined MSW landfill listed in Sections I and J of the SPRRs. [Note: Standard Monitoring Specifications specifically referring to a "Class II Unit" shall not apply to this facility.]

H. REPORTING REQUIREMENTS

1. The Discharger or persons employed by the Discharger shall comply with all notice and reporting requirements of the State Department of Water Resources with regard to construction, alteration, destruction, or abandonment of all monitoring wells used for compliance with this Order, including MRP No. R5-201X-XXXX, as required by Water Code sections 13750 through 13755.

14. If groundwater monitoring data for the site indicates that active corrective action measures will not likely be necessary to successfully complete corrective action (e.g., passive measures sufficient or release constituents attenuating naturally), and Board staff is in agreement, the requirement for suspension of such active corrective action measures shall be inapplicable and these notification and approval requirements considered waived by the Board. In such case, the Discharger may request that the proof period be deemed to have commenced in or after the first consecutive monitoring period in which concentrations of the constituents in groundwater were reduced to non-detect or background levels).

2. **Within 90 days** of adoption of this Order, the Discharger shall establish and maintain an account with the SWRCB's GeoTracker geographic information system data base, including a full declaration of the names and locations of all waste management units and Field Points (the GeoTracker name for monitoring points), plus a declaration of all COCs, and shall begin uploading word-searchable pdf copies of all monitoring program reports and associated laboratory sheets (the latter in GeoTracker's proprietary format) required under these WDRs. The Discharger shall also upload any additional monitoring program reports or report features required by the Executive Officer beginning with the Reporting Period following notification to submit such additional reports/report-features.
3. The Discharger shall comply with all the notification and reporting requirements applicable to a partially closed, unclassified/unlined MSW landfill contained in the SPRRs, including those in Sections I (Monitoring Specifications), J (Response to Release), and K (General Provisions).

I. STORM WATER SPECIFICATIONS

1. Annually, prior to the anticipated rainy season, but no later than 31 October, any necessary erosion control measures shall be implemented and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent storm water flows from:
 - a. Contacting or percolating through wastes;
 - b. Causing erosion or inundation of the landfill cover or other areas of site;
 - c. Causing sedimentation and clogging of the storm drains; and/or
 - d. Discharging sediment loads to surface waters.
2. Discharges to the onsite sedimentation basins shall be limited to non-contact storm water.
3. A freeboard of at least two (2.0) feet shall be maintained in the storm water detention basins at all times.
4. The Discharger shall maintain coverage under the NPDES General Storm Water Permit for Industrial Activities and maintain a Storm Water Pollution Prevention Plan and monitoring and reporting program under that permit.
5. The storm water facilities O&M plan (required under Facility Specification C.2) shall address the storm water detention basins and related facilities at the site (e.g., pump vaults, pipelines, SCADA controls) consistent with these WDRs, Title 27, section 21760(b), and applicable storm water regulations.¹⁵

15. At a minimum, the plan shall describe landfill drainage areas, expected storm water flows, liquid levels and water balance; detention times; pump operations and schedules; inspection and maintenance programs; contingency plans in the event of facility breakdown or failure; seasonality issues; and coordination of discharges to the City's combined sewer system.

6. The Discharger shall comply with all the Standard Storm Water Provisions applicable to a closed/inactive, unlined MSW landfill contained in Section L of the SPRRs. [Note: Standard Storm Water Specifications specifically referring to a "Class II Unit" shall not apply to this facility.]

J. PROVISIONS

1. The Discharger shall maintain a copy of this Order at the facility, including the MRP No. R5-201X-XXXX and the SPRRs dated November 2013 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. Pursuant to Water Code section 13267, the Discharger shall comply with MRP No. R5-201X-XXXX, which is attached to and made part of this Order. A violation of the MRP is a violation of these waste discharge requirements.
3. The Discharger shall comply with the applicable portions of the November 2013 SPRR incorporated by reference in Finding 2.e.
4. 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.
5. The Discharger shall comply with all applicable provisions of Title 27 and Subtitle D that are not specifically referred to in this Order.
6. Pursuant to Section 13267 of the California Water Code, the Discharger shall submit the following reports relevant to groundwater monitoring and compliance with the Water Quality Protection Standard under Title 27:

Report		Due Date
a.	A work plan for installation of a Point of Compliance monitoring well along the southwestern perimeter of the landfill prepared consistent with monitoring well installation work plan guidelines attached to this Order. See Information Sheet, Attachment 2.	15 September 2015
b.	A proposed Sample Collection and Analysis Plan per Standard Monitoring Specification I.7, SPRR.	15 October 2015
c.	A well installation report for the monitoring well installed under the above work plan, as approved, prepared consistent with monitoring well installation report guidelines attached to this Order. See Information Sheet, Attachment 2.	15 December 2015

d.	A Water Quality Protection Standard Report, including updated monitoring data analysis methods per MRP Section C.1.	31 January 2017
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All of the reports required above shall be prepared by a California-registered civil engineer or certified engineering geologist.

7. Pursuant to Section 13267 of the California Water Code, the Discharger shall submit the following reports relevant to LFG monitoring and the possible need for implementation of LFG controls at the site as a corrective action measure:

Report		Due Date
a.	A work plan for an LFG investigation, including installation and sampling of in situ monitoring probes, per Corrective Action Specification D.5.	15 July 2015
b.	Status report(s) on implementation of the above LFG investigation and any subsequent corrective action measures per Corrective Action Specification D.6.	Quarterly beginning 15 August 2015
c.	A certification report documenting installation of the LFG monitoring probes installed under the above work plan, as approved.	15 October 2015
d.	Gas probe sampling results	Semiannually per MRP
e.	A report of the results of the LFG investigation, including the need for LFG controls and soil gas corrective action monitoring wells to define the extent of LFG impacts.	15 December 2016
f.	A corrective action work plan to address LFG issues at the site, as necessary, per Corrective Action Specification D.6 (i.e., installation of LFG controls, associated monitoring systems, and soil gas corrective action monitoring wells).	15 May 2017
g.	A certification report documenting implementation of the above corrective action work plan to address LFG issues, as approved.	15 May 2018
h.	An amendment to the revised FC/PCMP submitted under Provision J.8.a reflecting the implementation of any necessary LFG controls and monitoring systems installed under J.7.f above, including monitoring schedules consistent with the MRP of this Order.	15 September 2018

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

8. Pursuant to Section 13267 of the California Water Code, the Discharger shall submit the following technical reports relevant to completing closure of the landfill:

	Report	Due Date
a.	A revised FC/PCMP addressing Elderberry Bush areas per Closure and Postclosure Maintenance Specification E.1.	15 January 2016
b.	Closure Status Report for Elderberry Bush areas (e.g., delisting; permitting/approvals; project schedule; site preparation and construction progress).	Quarterly beginning 15 February 2016
c.	Closure construction plans per Construction Specification F.12.	Within 30 days of VELB delisting
d.	Report showing initiation of project construction	Within 90 days of approval of construction plans
e.	Report showing completion of project construction	Within 120 days of initiation of project construction
f.	Closure Certification Report addendum documenting closure of Elderberry Bush areas.	Within 60 days of completion of project construction

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

9. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1. As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.
10. The Central Valley Water Board will review this Order periodically and may revise requirements when necessary.
11. This Order shall take effect upon the date of adoption.

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-201X-XXXX
CITY OF SACRAMENTO UTILITIES DEPARTMENT
SYLVIA DELLAR SURVIVOR'S TRUST
DELLAR LANDFILL
SACRAMENTO COUNTY

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I, PAMELA C. CREEDON, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on _____.

PAMELA C. CREEDON, Executive Officer

JDM: 17 March 2015