

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER NO. R5-2014-0086

WASTE DISCHARGE REQUIREMENTS  
FOR  
KINGS WASTE AND RECYCLING AUTHORITY  
HANFORD MUNICIPAL SOLID WASTE LANDFILL  
POSTCLOSURE MAINTENANCE AND CORRECTIVE ACTION  
KINGS COUNTY

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

1. The Kings Waste and Recycling Authority (hereinafter Discharger) owns and maintains the Hanford Municipal Solid Waste Landfill (facility) about 2.5 miles southwest of the City of Hanford, in the NE  $\frac{1}{4}$  of Section 4, T19S, R22E, MDB&M, as shown in Attachment A, which is incorporated herein and made part of this Order by reference. The facility is a municipal solid waste (MSW) landfill regulated under authority given in Water Code section 13000 et seq.; California Code of Regulations, title 27 ("Title 27"), section 20005 et seq.; and 40 Code of Federal Regulations section 258 (a.k.a, "Subtitle D") in accordance with State Water Resources Control Board (State Water Board) Resolution 93-62.
2. The facility is on a 96.4 acre property at the intersection of State Highway 43 and the Hanford-Armona Road, Hanford. The facility consists of one closed unlined waste management unit covering 79 acres. The existing permitted landfill area is shown in Attachment B, which is incorporated herein and made part of this Order by reference. The facility is comprised of Assessor's Parcel Numbers (APN) 016-013-051.
3. The Discharger submitted a revised corrective action program (CAP) which served as an amended Report of Waste Discharge (ROWD) to update the CAP for the landfill. The information in the revised CAP has been used in revising these waste discharge requirements (WDRs). The revised CAP contains the applicable information required in Title 27.
4. On 26 October 2007, the Central Valley Water Board adopted Order No. R5-2007-0154 in which the landfill waste management unit at the facility was classified as a Class III unit for the discharge of non-hazardous waste, municipal solid waste. This Order continues to classify the landfill unit as a Class III unit in accordance with Title 27.
5. The Discharger accepted wastes for disposal from 1973 through 1998. The facility was closed in 1999 with an engineered alternative composite cover system that is comprised of the following (in ascending order): a 12-inch thick foundation layer placed over an existing six to 12-inch thick intermediate cover; a non-reinforced geosynthetic clay layer; and an 18-inch thick vegetative layer.

6. On 19 November 1996, the Central Valley Water Board issued Cleanup and Abatement Order 96-706 (Order 96-706) for a release of waste constituents to groundwater. This order required the Discharger, in part, to complete an evaluation monitoring program (EMP), submit an engineering feasibility study (EFS) for a corrective action program (CAP), submit a time schedule to establish a CAP, and implement the CAP in accordance with the time schedule as approved.
7. On-site facilities at the Hanford Municipal Solid Waste Landfill include: an active landfill gas extraction system, a landfill gas flare, and a groundwater remediation system.
8. On 9 October 1991, the United States Environmental Protection Agency (USEPA) promulgated federal MSW regulations under the Resource Conservation and Recovery Act (RCRA), Subtitle D. These regulations are under 40 Code of Federal Regulations section 258, and are hereafter referred to as either "Subtitle D" in reference to the RCRA federal law that required the regulations or "40 C.F.R. section 258.XX". These regulations apply to all California Class II and Class III landfills that accept MSW. State Water Board Resolution 93-62 requires the Central Valley Water Board to implement in WDRs for MSW landfills the applicable provisions of the federal MSW regulations that are necessary to protect water quality, and in particular the containment provisions and the provisions that are either more stringent or that do not exist in Title 27.
9. This Order implements the applicable regulations for discharges of solid waste to land through Prohibitions, Specifications, Provisions, and monitoring and reporting requirements. Prohibitions, Specifications, and Provisions are listed in Sections A through H of these WDRs below, and in the Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Subtitle D and/or Title 27 (SPRRs), dated January 2012, which are attached hereto and made part of this Order by reference. Monitoring and reporting requirements are included in the Monitoring and Reporting Program (MRP) No. R5-2014-0086 and in the SPRRs. In general, requirements that are either in regulation or otherwise apply to all MSW landfills are considered to be "standard" and are therefore in the SPRRs. Any site-specific changes to a requirement in the SPRRs are included in the applicable section (A through H) of these WDRs, and the requirement in the WDRs supersedes the requirement in the SPRRs.
10. Title 27 contains regulatory standards for discharges of solid waste promulgated by the State Water Board and the California Department of Resources Recovery and Recycling (CalRecycle). In certain instances, this Order cites CalRecycle regulatory sections. Title 27, section 20012 allows the Central Valley Water Board to cite CalRecycle regulations from Title 27 where necessary to protect water quality provided it does not duplicate or conflict with actions taken by the Local Enforcement Agency in charge of implementing CalRecycle's regulations.

## WASTE AND UNIT CLASSIFICATION

11. The Discharger previously disposed of MSW, which is defined in §20164 of Title 27.

## SITE DESCRIPTION

12. The facility lies within the southern portion of the San Joaquin Valley, which taken together with the Sacramento Valley to the north, forms the Central Valley. The Central Valley is a large, northwest-trending structural trough that is bounded by the Sierra Nevada Mountains to the east and the Coast Ranges to the west. The facility and the surrounding area are on relatively flat terrain.
13. Land uses within one mile of the facility consist of agriculture, an unused tire disposal site, a meat packing plant, a hide skinning facility, and a cement plant.
14. Based on information in the Solid Waste Assessment Test, there are approximately 35 domestic, 23 agricultural, and one domestic/agricultural supply wells that are within one mile of the site. No surface springs have been observed. The Keverline residence, shown on Attachment A, has a domestic well that is approximately 1,050 feet west and hydraulically downgradient of the facility and the Martinez residence has a domestic well that is approximately 1,300 feet west/southwest and hydraulically downgradient of the facility. Due to volatile organic compound (VOC) impacts to groundwater addressed by Order 96-706, the Discharger installed activated carbon water filtration systems for the domestic wells serving the Keverline and Martinez residences.
15. The closest Holocene faults are the San Andreas Fault, which is approximately 55 miles to the southwest of the facility, and the Coalinga and Nunez Faults, which are approximately 45 miles to the west of the facility. Recorded magnitudes of seismic events along the San Andreas Fault near Parkfield range between 4.0 and 6.5 on the Richter scale and recorded magnitudes for the Coalinga and Nunez Faults are 6.5 and 6.0. The maximum credible acceleration for the site is estimated at 0.04 g.
16. The measured mean hydraulic conductivity of the native soils underlying the Unit range between approximately  $2 \times 10^{-3}$  and  $5 \times 10^{-8}$  centimeters/second (cm/sec).
17. Deposits of the Central Valley consist of both continental and marine materials ranging from Jurassic to Holocene age. Valley-fill sediments in the Hanford area exceed 6,000 feet in thickness and result from alluvial, fluvial, lacustrine, and marine depositional processes. These processes have combined to form a heterogeneous mixture of clays, silts, sands, and gravels.
18. The facility receives an average of 8.29 inches of precipitation per year as measured at the Hanford Station. The mean pan evaporation is 78.98 inches per year as measured at the Corcoran El Rio Station.

19. The 100-year, 24-hour precipitation event is estimated to be 2.55 inches, based on Department of Water Resources' bulletin entitled *Rainfall Depth-Duration-Frequency for California*, revised November 1982, updated August 1986.
20. The facility is not within a 100-year flood plain based on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, Community-Panel Number 060086 0075B for Kings County.
21. Storm water percolation/evaporation basins are located immediately southwest (Area A1 SW Basin) and southeast (Area A5 SE Basin) of the Unit, and another (Area A6 SE Basin) is located south of the SE Basin as shown on Attachment B. The storm water percolation/evaporation basins capture storm water runoff from the facility and retain it on-site. Additionally, the percolation/evaporation basins will be utilized for the discharge of treated effluent from the facility's groundwater extraction/aeration system.

### **SURFACE WATER AND GROUNDWATER CONDITIONS**

22. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition* (hereafter Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Tulare Lake Basin.
23. Surface drainage is southward toward Tulare Lake, which is in the Hanford-Lemoore Hydrologic Area (551.90) of the Tulare Lake Hydrologic Basin. There are no perennial streams in the immediate vicinity of the facility. The Settlers Ditch passes from north to south along the eastern margin of the facility
24. The facility is on the floor of the southern San Joaquin Valley. The designated beneficial uses of surface waters on the valley floor, as specified in the Basin Plan, are agricultural supply, industrial service and process supply, water contact and non-contact water recreation, warm fresh water habitat, wildlife habitat, preservation of rare, threatened, and endangered species, and groundwater recharge.
25. The first encountered groundwater beneath the facility ranges between 120 feet and 131 feet below ground surface (bgs) depending on location at the facility (Second Semiannual 2013 Detection Monitoring Report). Groundwater elevations range between 120 feet and 108 feet above mean sea level (MSL). The first encountered groundwater is above the E clay and considered to be unconfined. However, due to intermittent clay layers (such as the A or C clay layer) in the overlying alluvial deposits, local perched and semi-confined groundwater zones may occur above the E clay. The depth to groundwater fluctuates seasonally as much as 25 to 30 feet depending on location.
26. Based on the Second Semiannual 2013 Detection Monitoring Report, monitoring data indicate that background groundwater quality for first encountered groundwater has an electrical conductivity (EC) of 1,032 micromhos/cm, with total dissolved solids (TDS) of 780 milligrams per liter (mg/L).

27. The direction of groundwater flow is generally toward the west, but varies seasonally and periodically toward the southwest. The average groundwater gradient is approximately 0.004 feet per foot. Based on the Second Semiannual 2013 Detection Monitoring Report, the groundwater flow velocity is approximately 297 feet per year.
28. The facility is in Detailed Analysis Unit (DAU) 238 of the Tulare Lake Basin Plan. The designated beneficial uses of the groundwater, as specified in the Basin Plan are municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply.

### **GROUNDWATER AND UNSATURATED ZONE MONITORING**

29. The existing groundwater monitoring network for the facility consists of background monitoring well HL-12; point of compliance detection monitoring wells HL-6, HL-7, HL-8, HL-9, HL-10, HL-11 and HL-15. Point of compliance detection monitoring wells HL-7 and HL-9 are currently dry. Monitoring well HL-5 is utilized only for groundwater elevation monitoring. Monitoring well HL-5 is currently dry. Groundwater monitoring wells MW-1, HL-13, and HL-14 are corrective action monitoring wells. With exception to point of compliance detection monitoring well HL-7, which is completed in a perched groundwater zone, all other point of compliance detection monitoring and corrective action monitoring wells are completed in the unconfined groundwater zone. Five other wells, EX-1 through EX-5, have been installed along the point of compliance and are utilized for groundwater extraction. All wells are shown on Attachment B.
30. The Discharger's detection monitoring program (DMP) for groundwater does not satisfy the requirements contained in Title 27 due to the fact that point of compliance detection monitoring well HL-9 is currently dry and has been dry for at least two years. As a result, groundwater monitoring at the central location of the point of compliance (see Attachment B) cannot be conducted and waste constituents may potentially migrate west of the point of compliance without being detected. The Discharger, in a 25 June 2011 meeting, stated that point of compliance detection monitoring well HL-9 could possibly be modified to make it operational, or be replaced with a new detection monitoring well. In an 18 July 2012 letter and memorandum, Central Valley Water Board staff requested the Discharger to submit a plan and time schedule for the repair or replacement of point of compliance detection monitoring well HL-9 following approval of the proposed CAP.
31. Volatile organic compounds (VOCs) are often detected in a release from a MSW landfill and are often associated with releases of landfill gas rather than leachate. Since volatile organic compounds are not naturally occurring and thus have no background value, they are not amenable to the statistical analysis procedures contained in Title 27 for the determination of a release of wastes from a landfill unit. Title 27, sections 20415(e)(8) and (9) allows the use of a non-statistical evaluation of monitoring data that will provide the best assurance of the earliest possible detection of a release from a landfill unit in accordance with Title 27, sections 20415(b)(1)(B)2.-4. However, Title 27 does not specify a specific method for non-statistical evaluation of monitoring data.

32. 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.
33. 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.
34. 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).
35. The Discharger submitted a Water Quality Protection Standard (WQPS) plan in 1997. The WQPS report proposed statistical data analysis methods to calculate concentration limits for each monitored constituent in accordance with Title 27. After some minor revisions, the Discharger's WQPS plan was approved by Central Valley Water Board staff in 2001. The WQPS and approved data evaluation methods are included in MRP R5-2014-0086.
36. The Unit is unlined without a leachate collection and removal system (LCRS), therefore, unsaturated zone detection monitoring for leachate is not being conducted at the facility. Installing an unsaturated zone monitoring system for leachate (i.e., lysimeters) beneath the Unit at this time would not be practical based on the fact the existing Unit is closed, unlined without an LCRS, and has already leaked waste constituents to groundwater. The Discharger is conducting semiannual landfill gas (LFG) monitoring around the perimeter of the facility. The LFG monitoring system consists of nine wells, VW-1 through VW-9, which are shown on Attachment B. The LFG monitoring wells contain two or three

nested probes that are installed at depths ranging from seven to 60 feet below grade. Samples from the wells are analyzed for methane.

### **GROUNDWATER DEGRADATION AND CORRECTIVE ACTION**

37. The Unit has released volatile organic compounds (VOCs) including: acetone; benzene, cis-1,2-dichloroethene (cis-1,2-DCE); trichlorofluoromethane (CFC-11); dichlorodifluoromethane (CFC-12); tetrachloroethene (PCE); trichloroethene (TCE); 1,1-dichloroethane (1,1-DCA); 1,1-dichloroethene (1,1-DCE); methylene chloride; trans-1,2-dichloroethene (trans-1,2-DCE); vinyl chloride; and 1,1,1-trichloroethane to groundwater. The latest self-monitoring report (Second Semiannual 2013 Detection Monitoring Report) detected: CFC-12; 1,1-DCA; 1,1-DCE; cis-1,2-DCE; TCE; PCE; CFC-11; toluene, ethylbenzene, xylenes, and vinyl chloride in point of compliance and corrective action groundwater monitoring wells. Based on analytical results from samples collected from LFG monitoring wells, degradation by VOCs in groundwater beneath the Unit, especially the northwestern corner of the Unit where VOC concentrations are the highest, is attributed to LFG migration.
38. Inorganic waste constituents detected in point of compliance groundwater monitoring wells at concentrations statistically exceeding their respective background concentrations include: bicarbonate; carbonate; sulfate; total dissolved solids (TDS); calcium; magnesium; and potassium. The latest self-monitoring report (Second Semiannual 2013 Detection Monitoring Report) detected: calcium, chloride, sulfate, and TDS in point of compliance groundwater monitoring wells at levels statistically exceeding their respective background concentrations. No inorganic waste constituent exceedences of background concentrations occurred at corrective action groundwater monitoring wells.
39. Order 96-706, adopted on 19 November 1996, directed the Discharger, in part, to complete an EMP and establish a CAP in accordance with a time schedule. The Discharger adequately determined the nature and lateral and vertical extent of the release. Total VOC concentrations at the point of compliance and off-site locations ranged upward to 55 micrograms/liter. However, either PCE, TCE, and/or vinyl chloride exceeded their respective Maximum Contaminant Levels at detection monitoring wells HL-7 and HL-8, and evaluation monitoring well HL-13. Currently (Second Semiannual 2013 Detection Monitoring Report), PCE exceeds its MCL at monitoring wells HL-6, HL-13, HL-15, and extraction well EX-2. The EMP was deemed complete on 15 May 2002 in compliance with Order 6 and Task 19.e. of Order 96-706. Analytical data from evaluation groundwater monitoring determined that the lateral extent of the VOC plume was approximately 1,500 feet west of the Unit, 750 feet southwest of the Unit; approximately 200 feet north of the Unit; and approximately 100 feet east and south of the Unit. The vertical extent of the VOC plume appeared to be approximately 202 feet bgs. The lateral and vertical extent of inorganic waste constituents in groundwater fell within the VOC plume boundary.
40. The VOC plume impacted two domestic supply wells at residences (Keverline and Martinez residences) west of the Unit. The residences have been provided with activated-carbon filtration systems by the Discharger.

41. The Discharger submitted an updated EFS for a CAP on 23 December 2002. The feasibility study proposed extracting groundwater from extraction wells along the hydraulically downgradient point of compliance. Extracted groundwater was proposed to be utilized to moisten compost wind-rows as a part of the facility's composting operations. Excess extracted groundwater was proposed to be stored in five above ground storage tanks until it could be used in the composting operations. The updated EFS for a CAP proposed testing the corrective action measures for a period of five years. Revisions by the Discharger were made to the updated EFS for a CAP and in a March 2004 letter and memorandum, Central Valley Regional Water Quality Control Board staff concurred with the Discharger's updated EFS for a CAP proposal and informed the Discharger that it could proceed with corrective action. The corrective action program was implemented on 9 June 2005 in compliance with Order 10. and Task 19.h. of Order 96-706.
42. The Discharger submitted a report on 21 February 2006 summarizing the results of installation, testing, and initial operation of the groundwater extraction system. After reviewing the report, Central Valley Water Board staff, in a 10 March 2006 letter and memorandum, determined that the groundwater extraction system was not achieving complete capture of degraded groundwater along the Unit's western point of compliance and requested revisions to the groundwater extraction system. In a letter dated 6 April 2006, the Discharger stated that revisions would not be made to the groundwater extraction system since the Central Valley Water Board had already approved a five-year test for the corrective action measures. In 2007, the Discharger terminated composting operations, which suspended the extraction of degraded groundwater as well as corrective action.
43. The Discharger submitted a subsequent revised CAP on 27 July 2009. After revisions were made to the 27 July 2009 revised CAP, a final revised CAP was submitted on 19 February 2013. The Discharger's final revised CAP proposes a five-year pilot test utilizing a groundwater extraction/aeration system to remediate VOCs in groundwater and control the hydraulically downgradient migration of VOCs in groundwater. Proposed is that groundwater would initially be extracted from extraction well EX-2, where the most significant concentrations of total VOCs in groundwater have been detected, and pumped into four 10,000-gallon above ground tanks for aeration. The aeration system would consist of a float-based aerator, and possibly more, placed inside each of the above-ground tanks to volatilize VOCs to nondetectable concentrations. Once it is determined that the extraction/aeration system is removing VOCs from the extracted groundwater, the Discharger shall evaluate whether additional site groundwater extraction wells should be added to the CAP. Following aeration, the treated groundwater would be discharged to one or more on-site evaporation/percolation basins (see basins A1, A5, and A6 in Attachment 2). Additionally, the Discharger proposes increasing LFG extraction in the northwestern portion of the Unit where VOC concentrations are the highest to control VOC migration to groundwater.
44. The Discharger proposes to monitor the influent to and effluent from the aeration system, for VOCs. The combined stormwater runoff and effluent from the aeration system within the evaporation/percolation basins are proposed to be monitored for inorganic waste

constituents. Additionally, semiannual monitoring of point of compliance and corrective action groundwater monitoring wells for inorganic waste constituents and VOCs will continue. Monitoring of the influent to the aeration system is proposed to be conducted bi-weekly for the first 90 days from start-up and thereafter on a quarterly basis to:

1) determine the time frame required for the groundwater extraction system to reach steady-state conditions with respect to VOC concentrations; and 2) estimate pump shut-off periods to allow groundwater containing higher VOC concentrations to reach the capture zone of the extraction wells before commencing a new pump cycle. Effluent monitoring for VOCs is proposed to be conducted bi-weekly for the first 90 days from start-up and thereafter on a quarterly basis.

45. The revised CAP proposes to conduct the extraction/aeration system for a period of five years to allow the opportunity to run the groundwater extraction/aeration system to:
- 1) evaluate its effectiveness in remediating VOCs in groundwater and creating a barrier to limit down gradient migration of VOCs to off-site locations; 2) make adjustments to the system as needed to ensure that VOCs in groundwater are being remediated to comply with the WQPS; and 3) to demonstrate that the proposed on-site percolation/evaporation basins have the capacity to accommodate aeration system effluent discharges in addition to stormwater runoff during a worst case scenario precipitation event.
46. The Discharger proposes to submit: 1) monthly status reports on the effectiveness of the proposed groundwater extraction/aeration system in remediating groundwater for one year after its implementation; 2) annual status reports for each year of the five-year pilot test that evaluates the progress of the proposed groundwater extraction/aeration system; and 3) a technical report on the performance of the proposed groundwater extraction/aeration system at the end of the five-year pilot test period.
47. The Discharger proposes appropriate modifications to the CAP, or submission of a new CAP proposal, within 90 days of the determination by the Discharger or Central Valley Water Board staff that the proposed extraction/aeration system does not remediate VOCs to levels at or below their respective concentration limits established with the WQPS. Although a five-year pilot test of the CAP was proposed, modifications to the CAP, or the submission of a new CAP proposal could be required prior to the end of the five-year pilot test period if it is determined by the Discharger or Central Valley Water Board staff that the proposed CAP is not effective.
48. In a 6 February 2014 letter and memorandum, Central Valley Water Board staff determined that the revised CAP has potential to remediate VOCs in groundwater without creating additional water quality impacts to down gradient receptors and concurred with the Discharger's CAP proposal.

#### **LANDFILL POST-CLOSURE MAINTENANCE**

49. The Discharger submitted a final closure and postclosure maintenance plan in May 1992. After several revisions, the final closure and postclosure maintenance plan was approved on 25 October 1996 with the adoption of Waste Discharge Requirements Order 96-706.

50. The approved final closure and postclosure maintenance plan includes inspections, maintenance, and monitoring of the landfill during the postclosure maintenance period, and includes a postclosure maintenance cost estimate for the entire facility. Inspection and maintenance will include the condition of the final cover, drainage features, groundwater monitoring wells, access roads, landfill gas monitoring system, groundwater corrective action system, and site security. The plan will be implemented for a minimum period of 30 years or until the waste no longer poses a threat to water quality, whichever is greater.
51. Pursuant to Title 27, section 21090(e)(1), an initial survey of the final cover generating a baseline topographic map was completed in May 1999 following closure activities and is to be used for later comparison with iso-settlement surveys. A file review indicates that the five-year iso-settlement maps for the facility for 2004 and 2009 have not been submitted. Pursuant to Title 27, section 21090(e)(2), once every five years following final closure and during the postclosure maintenance period, iso-settlement maps shall be prepared to determine the amount of differential settlement occurring over the previous five years. This Order requires the Discharger to submit the required iso-settlement maps.
52. The completed final cover will be monitored for performance and for damage or defects by visual inspection pursuant to California Code of Regulations, Title 27, Section 21090(a)(4)(A). Defects will be repaired and tested for adequacy based on the closure Construction Quality Assurance Plan.

### **FINANCIAL ASSURANCES**

53. Title 27, Sections 21840 and 22211 requires a cost estimate for landfill postclosure maintenance. The mechanism utilized for the generation of postclosure maintenance funds is a pledge of revenue agreement. This Order requires that the Discharger maintain financial assurance with CalRecycle in at least the amount of the post-closure maintenance cost estimate adjusted annually for inflation. As of 27 April 2012, the balance of the post-closure maintenance fund was \$2.7 million.
54. Title 27, Section 22221 requires a cost estimate for corrective action of all known or reasonably foreseeable releases. The mechanism utilized for the generation of corrective action funds is a pledge of revenue agreement. This Order requires that the Discharger maintain financial assurance with the CalRecycle in at least the amount of the cost estimate adjusted annually for inflation. As of 27 April 2012, the balance of the corrective action fund was \$ 0.35 million.

### **CEQA AND OTHER CONSIDERATIONS**

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

56. This order implements:

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

57. Based on the threat and complexity of the discharge, the facility is determined to be classified 1B as defined below:

- a. Category 1 threat to water quality, defined as, "Those discharges of waste that could cause the long-term loss of a designated beneficial use of the receiving water. Examples of long-term loss of a beneficial use include the loss of drinking water supply, the closure of an area used for water contact recreation, or the posting of an area used for spawning or growth of aquatic resources, including shellfish and migratory fish."
- b. Category B complexity, defined as, "Any discharger not included in Category A that has physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal) or any Class 2 or Class 3 waste management units."

58. Water Code section 13267(b) provides that: "In conducting an investigation specified in subdivision (a), the Regional Board may require that any person who has discharged, discharges, or is suspected of having discharge or discharging, or who proposed to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who had discharged, discharges, or is suspected of having discharged or discharging, or who proposed to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports.

59. The technical reports required by this Order and the attached "Monitoring and Reporting Program No. R5-2014-0086" are necessary to assure compliance with these waste discharge requirements. The Discharger owns the facility that discharged the waste subject to this Order.

## PROCEDURAL REQUIREMENTS

60. All local agencies with jurisdiction to regulate land use, solid waste disposal, air pollution, and to protect public health have approved the use of this site for the discharges of waste to land stated herein.
61. The Central Valley Water Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
62. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to California Water Code Sections 13263 and 13267, that Order R5-2007-0154 is rescinded except for purposes of enforcement, and that the Kings Waste and Recycling Authority its agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

### A. PROHIBITIONS

1. The discharge of any additional waste is prohibited.
2. The Discharger shall comply with all Standard Prohibitions listed in Section C of the SPRRs.

### B. DISCHARGE SPECIFICATIONS

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

### C. FACILITY SPECIFICATIONS

1. The Discharger shall comply with all Standard Facility Specifications listed in Section E of the SPRRs.

### D. POST-CLOSURE MAINTENANCE SPECIFICATIONS

1. The **By 31 October 2014**, the Discharger shall submit, pursuant to Title 27, Section 21090(e)(2), an iso-settlement map accurately depicting the estimated total change in elevation of each portion of the final cover's low-hydraulic conductivity layer. This map shall show the total lowering of the surface elevation of the final cover relative to the baseline topographic map and shall indicate all areas where visually noticeable differential settlement may have been obscured by grading operations. The map shall be drawn to the same scale and contour interval as the baseline topographic map.

2. The Discharger shall comply with all Standard Closure and Post-Closure Specifications listed in Section G of the SPRRs.

## **E. FINANCIAL ASSURANCE SPECIFICATIONS**

1. The Discharger shall obtain and maintain assurances of financial responsibility with CalRecycle for post-closure maintenance for the landfill in at least the amounts described in Finding 53, adjusted for inflation annually. A report regarding financial assurances for post-closure maintenance shall be submitted to the Central Valley Water Board by **1 October of each year**. This may be the same report that is submitted to CalRecycle for this purpose. If CalRecycle determines that either the amount of coverage or the mechanism is inadequate, then within 90 days of notification, the Discharger shall submit an acceptable mechanism to CalRecycle and the Central Valley Water Board for at least the amount of the approved cost estimate.
2. The Discharger shall obtain and maintain assurances of financial responsibility with CalRecycle for initiating and completing corrective action for all known or reasonably foreseeable releases from the landfill in at least the amount of the annual inflation-adjusted cost estimate described in Finding 54. A report regarding financial assurances for corrective action shall be submitted to the Central Valley Water Board by **1 October of each year**. This may be the same report that is submitted to CalRecycle for this purpose. If CalRecycle determines that either the amount of coverage or the mechanism is inadequate, then within 90 days of notification, the Discharger shall submit an acceptable mechanism to CalRecycle and the Central Valley Water Board for at least the amount of the approved cost estimate.
3. The Discharger shall comply with all Standard Financial Assurance Specifications listed in Section H of the SPRRs.

## **F. MONITORING SPECIFICATIONS**

1. **By 31 October 2014**, the Discharger shall submit a plan and time schedule to either repair or replace point of compliance detection monitoring well HL-9.
2. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, and in accordance with Monitoring and Reporting Program (MRP) No. R5-2014-0086, and the Standard Monitoring Specifications listed in Section I of the SPRRs.
3. The Discharger shall, for any landfill unit in a corrective action monitoring program, comply with the corrective action monitoring program provisions of Title 27, MRP No. R5-2014-0086, and the Standard Monitoring Specifications listed in Section I of SPRRs.
4. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, MRP No. R5-2014-0086, and the SPRRs.

5. The concentrations of the constituents of concern in waters passing the Point of Compliance (defined pursuant to Title 27, section 20164 as a vertical surface located at the hydraulically downgradient limit of the landfill unit that extends through the uppermost aquifer underlying the unit) shall not exceed the concentration limits established pursuant to MRP No. R5-2014-0086.
6. For each monitoring event, the Discharger shall determine whether the landfill is in compliance with the Water Quality Protection Standard using procedures specified in MRP No. R5-2014-0086 and the Standard Monitoring Specifications in Section I of the SPRRs.
7. The Discharger shall comply with all Standard Monitoring Specifications and Response to a Release specifications listed in Sections I and J of the SPRRs.

## **G. CORRECTIVE ACTION SPECIFICATIONS**

1. The Discharger shall initiate groundwater extraction from extraction well EX-2 adjacent to the northwestern area of the Unit where the highest concentration of total VOCs have been detected to verify that the extraction/aeration system is removing VOCs from the extracted groundwater. Once it is determined that the extraction/aeration system is removing VOCs from the extracted groundwater, the Discharger shall evaluate whether additional site groundwater extraction wells should be added to the extraction CAP.
2. The Discharger shall monitor the influent to the aeration system on a bi-weekly basis for the first 90 days from start-up and thereafter on a quarterly basis to: 1) determine the time frame required for the groundwater extraction system to reach steady-state conditions with respect to VOC concentrations; 2) estimate pump shut-off periods to allow groundwater containing higher VOC concentrations to reach the capture zone of the extraction wells before commencing a new pump cycle, and 3) monitor the total VOC concentrations. The bi-weekly analytical results of influent shall be submitted in the monthly status reports for the first three months from start-up (see Corrective Action Specification G.6) and the quarterly analytical results of influent shall be submitted in the semiannual monitoring reports. The rate and volume of extracted groundwater shall be monitored on a monthly basis and be submitted in the semiannual monitoring reports.
3. The Discharger shall collect and analyze effluent from the groundwater extraction/aeration system on at least a bi-weekly basis for the first 90 days from start-up of the groundwater extraction/aeration system and then on a quarterly basis thereafter. The bi-weekly analytical results of effluent shall be submitted in the monthly status reports for the first three months from start-up (see Corrective Action Specification G.6) and the quarterly analytical results of effluent shall be submitted in the semiannual monitoring reports.

4. The groundwater extraction/aeration system shall successfully remediate VOCs to nondetect prior to discharging the aeration system effluent to an on-site evaporation/percolation basin.
5. **By 31 March 2015**, the Discharger shall submit a plan for sampling water (combined aeration system effluent and stormwater runoff) in the evaporation/percolation basins. The sampling plan needs to provide a periodic sampling schedule and analyses for the inorganic waste constituents listed in Table 1 of Monitoring and Reporting Program R5-2014-0086.
6. The Discharger shall submit monthly status reports on the effectiveness of the proposed extraction/aeration system in remediating ground water for the first 90 days from start-up and thereafter on a quarterly basis. The quarterly status reports shall be submitted in the semiannual monitoring reports.
7. **By 30 November 2014**, the Discharger shall submit a plan for modifying the LFG extraction system to increase LFG extraction in the northwestern portion of the Unit where VOC concentrations in LFG, especially PCE, are the highest.
8. **By 31 October 2014**, the Discharger shall submit a plan for removing algae and/or fine silt from the base and side-walls of the evaporation/percolation basins to maintain infiltration of aeration system effluent and stormwater runoff.
9. **By 30 April 2015**, the groundwater extraction and aeration system shall be operating and fully functional as described in the CAP and pursuant to Section 20430 of Title 27, to remediate the release of waste constituents from the Unit and to ensure compliance with the WQPS.
10. The Discharger shall submit an annual status report that evaluates and summarizes the progress of the proposed corrective action measures. The annual corrective action program status report needs to contain tables showing the concentrations of detected VOCs at groundwater monitoring wells MW-1, HL-13, and HL-14 for each monitoring event beginning with the VOC concentrations at the implementation of the groundwater extraction/aeration system, and time/plot graphs showing stability, decreases, or increases in VOC concentrations at groundwater monitoring wells MW-1, HL-13, and HL-14. Additionally, the annual status report shall evaluate whether inorganic waste constituents are increasing in groundwater and/or spreading to off-site locations as a result of discharging aeration system effluent to the percolation/evaporation basins and evaluate whether mounding beneath the percolation/evaporation basins is impacting the monitoring effectiveness of nearby groundwater monitoring wells. The annual status report shall be included in the Annual Monitoring Summary Report.
11. **By 30 November 2019**, The Discharger shall submit a technical report that evaluates the performance of the proposed groundwater extraction/aeration system and whether it should continue, be modified, or replaced with an alternative corrective action method.

12. **Within 90 days** of making a determination or of receiving written notification from the Executive Officer of such a determination based on the technical report (see Corrective Action Specification G.11), that the groundwater extraction/aeration system is unsuccessful in remediating VOCs to levels at or below their respective concentration limits established with the WQPS, the Discharger shall submit an amended ROWD for Executive Officer approval, to make appropriate modifications to the CAP or propose alternative corrective action methods to remediate VOCs.
13. If at any time, either the Discharger or the Executive Officer determines that the groundwater extraction/aeration system is unsuccessful in remediating VOCs in groundwater, the Discharger shall, **within 90 days of making the determination, or of receiving written notification from the Executive Officer of such determination**, submit an amended ROWD for Executive Officer approval, to make appropriate modifications to the CAP, or that proposes an alternative correction action method to remediate VOCs in groundwater.

The amended ROWD shall include the following:

- 1) A discussion as to why existing corrective action measures have been ineffective or insufficient.
  - 2) A revised evaluation monitoring plan if necessary to further assess the nature and extent of the release.
  - 3) A discussion of corrective action needs and alternatives.
  - 4) Proposed alternative corrective action measures, as necessary, for:
    - a) Groundwater cleanup, and/or
    - b) Landfill gas control.
  - 5) A plan to monitor the progress of corrective action measures consistent with MRP R5-2014-0086.
  - 6) Cost estimates for implementing additional corrective action, including monitoring.
14. **Within one year** of Executive Officer approval of the amended ROWD to make appropriate modifications to the CAP or an alternative corrective action method, the Discharger shall implement the modified CAP or an alternative corrective action method to remediate VOCs.
  15. **Upon completion of corrective action**, the Discharger shall certify, in writing, that corrective action has been completed in compliance with Title 27 and the WDRs. The certification shall be signed by a California Registered Civil Engineer or Professional

Geologist. Corrective action shall continue to be implemented until such time that the Discharger receives written notification of concurrence from the Executive Officer that corrective action has been completed in compliance with Title 27 and this Order.

## H. PROVISIONS

1. The Discharger shall maintain a copy of this Order at the facility, including the MRP No. R5-2014-0086 and the SPRRs, and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.
2. The Discharger shall comply with all applicable provisions of Title 27 and Subtitle D that are not specifically referred to in this Order.
3. The Discharger shall comply with MRP No. R5-2014-0086, which is incorporated into and made part of the Order by reference.
4. The Discharger shall comply with the applicable portions of the Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Subtitle D and/or Title 27 (SPRRs), dated January 2012, which are attached hereto and made part of this Order by reference.
5. If there is any conflicting or contradictory language between the WDRs, the MRP, or the SPRRs, then language in the WDRs shall supersede either the MRP or the SPRRs, and language in the MRP shall supersede the SPRRs.
6. All reports required by this Order shall be submitted pursuant to Water Code section 13267.
7. The Discharger shall complete the tasks contained in these waste discharge requirements in accordance with the following time schedule:

<u>Task</u>	<u>Compliance Date</u>
<b>A. Postclosure Maintenance</b>	
1. Submit an iso-settlement map (see (Postclosure Maintenance Specification D.1)	<b>By 31 October 2014</b>
<b>B. Detection Monitoring</b>	
1. Submit a plan and time schedule to either repair or replace point of compliance detection monitoring well HL-9. (see Monitoring Specification F.1)	<b>By 31 October 2014</b>

### **C. Corrective Action**

1. Submit a plan for sampling water in the in the evaporation/percolation basins. The plan needs to provide a periodic sampling schedule and analyses for the inorganic waste constituents listed in Table 1 of Monitoring and Reporting Program R5-2014-0086.  
(see Corrective Action Specification G.5)  
**By 31 March 2015**
  
2. Submit a plan for modifying the LFG extraction system to increase LFG extraction in the northwestern portion of the Unit.  
(see Corrective Action Specification G.7)  
**By 30 November 2014**
  
3. Submit a plan for removing algae and/or fine silt from the base and side-walls of the percolation basins.  
(see Corrective Action Specification G.8)  
**By 31 October 2014**
  
4. The groundwater aeration and extraction system shall be operating and fully functional as described in the approved CAP.  
(see Corrective Action Specification G.9)  
**By 30 April 2015**
  
5. Submit a technical report on the performance of the of the proposed groundwater extraction/aeration system in remediating VOCs.  
(see Corrective Action Specification G.11)  
**By 30 November 2019**
  
6. Submit an amended ROWD for Executive Officer approval, to make appropriate changes to the CAP and/or propose alternative correction action methods to remediate VOCs, if it is determined in the technical report (see Corrective Action Specification G.11) that the groundwater extraction/aeration system is unsuccessful.  
(see Corrective Action Specification G.12)  
**Within 90 days of making a determination or of receiving written notification from the Executive Officer of such a determination**

7. Submit an amended ROWD for Executive Officer approval, to make appropriate modifications to the CAP or propose alternative correction action methods to remediate VOCs, if at any time it is determined by either the Discharger or the Executive Officer, that the groundwater extraction/aeration system is unsuccessful. (see Corrective Action Specification G.13)

**Within 90 days of making a determination or of receiving written notification from the Executive Officer of such a determination**

8. Implement the modified CAP or an alternative correction method action to remediate VOCs in groundwater. (see Corrective Action Specification G. 14)

**Within one year of Executive Officer approval of the amended ROWD to make appropriate modifications to the CAP or propose an alternative corrective action method**

9. Certify, in writing, that corrective action has been completed in compliance with Title 27 and the WDRs. (see Corrective Action Specification G. 15)

**Upon completion of corrective action**

#### **D. Financial Assurance Review**

1. Annual Review of Financial Assurance for Post-closure maintenance. (see Financial Assurance Specification E.1).

**1 October of each year**

2. Annual Review of Financial Assurance for initiating and completing corrective action. (see Financial Assurance Specification E.2).

**1 October of each year**

8. The Discharger shall comply with all General Provisions listed in Section K of the SPRRs.

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

[http://www.waterboards.ca.gov/public\\_notices/petitions/water\\_quality](http://www.waterboards.ca.gov/public_notices/petitions/water_quality)

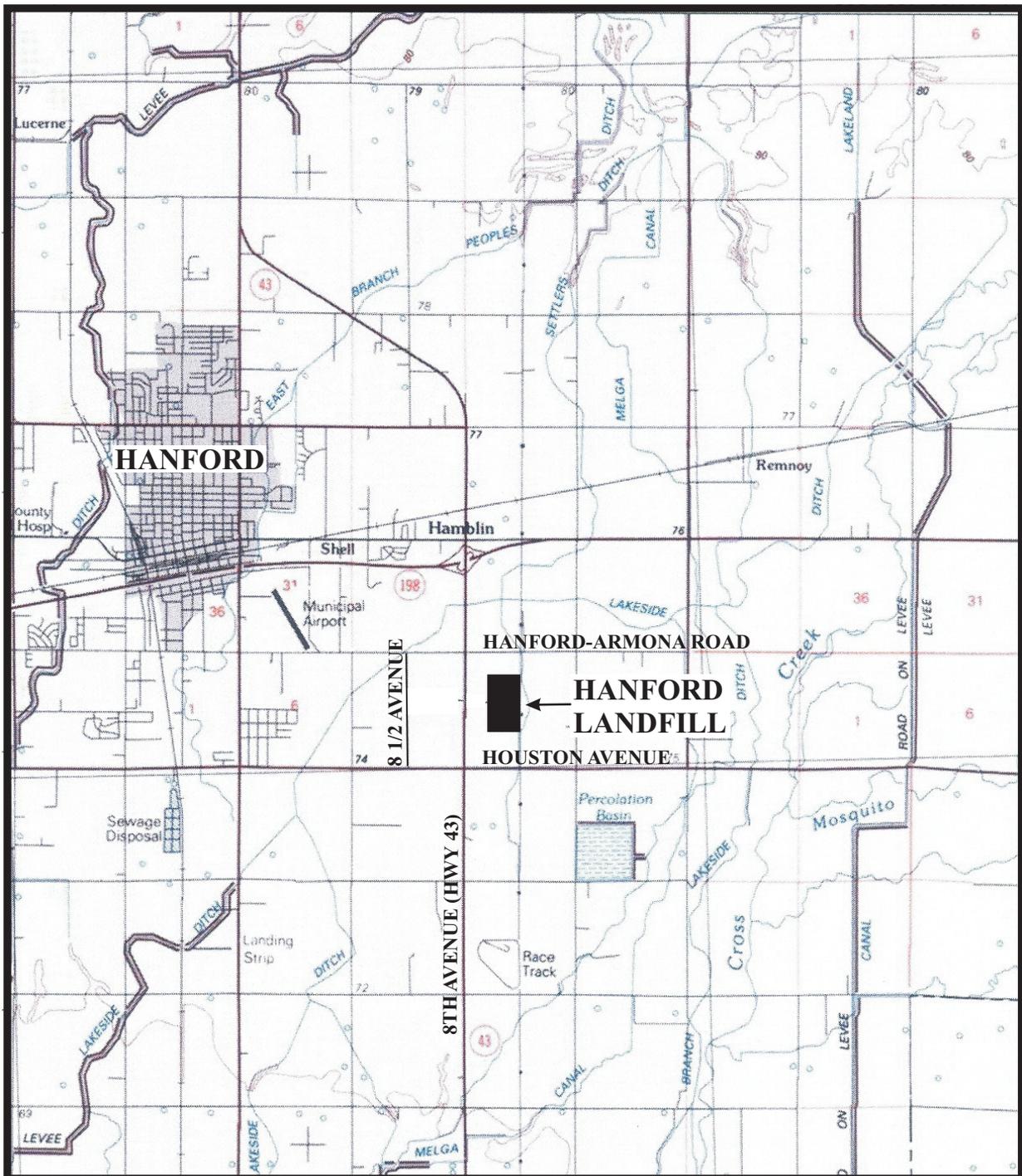
or will be provided upon request.

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 6 June 2014.

*Original signed by:*

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PAMELA C. CREEDON, Executive Officer



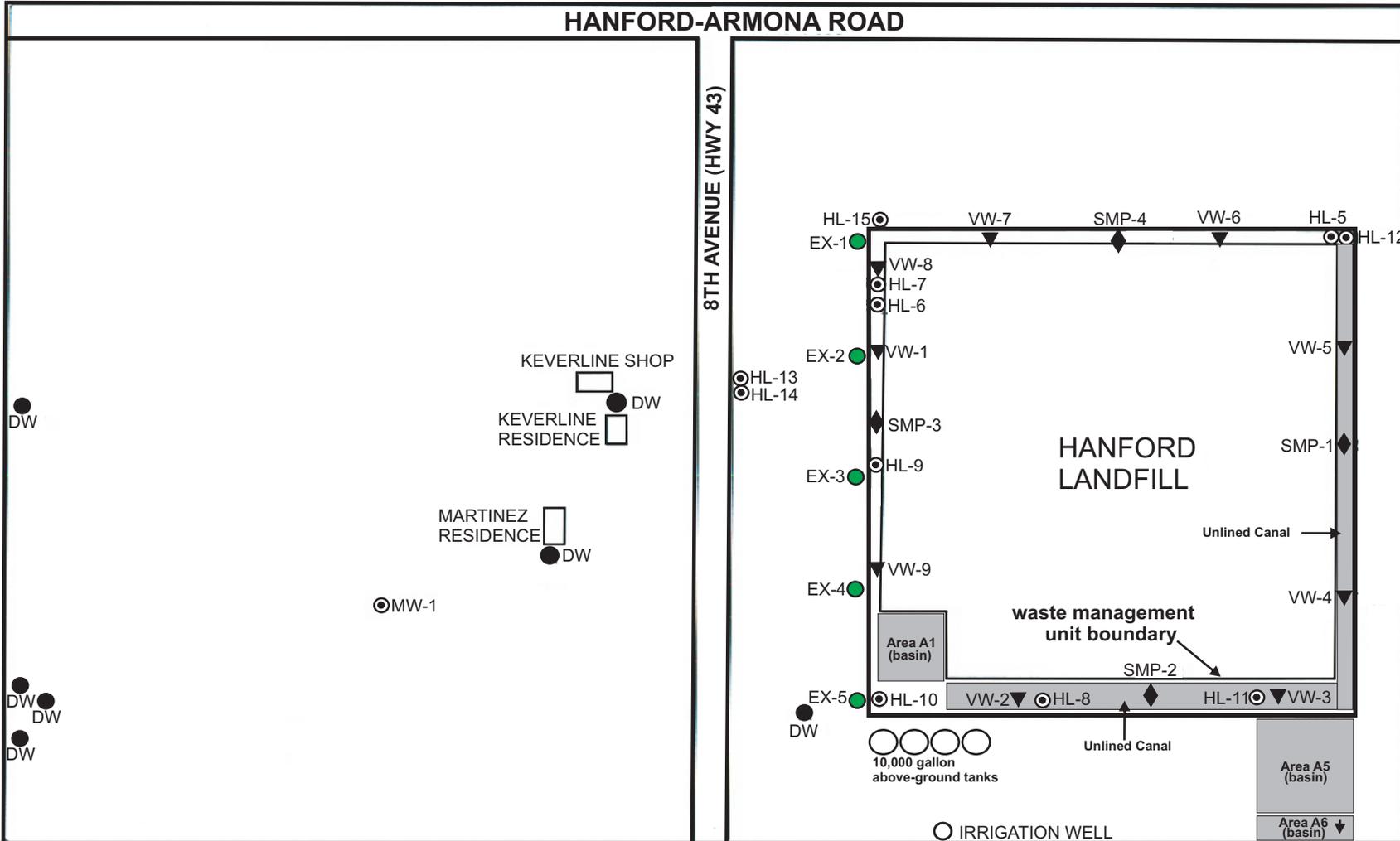
**ATTACHMENT A**  
 ORDER NO. R5-2014-0086  
 WASTE DISCHARGE REQUIREMENTS  
 FOR  
 KINGS WASTE AND RECYCLING AUTHORITY  
 FOR  
 POSTCLOSURE MAINTENANCE AND CORRECTIVE ACTION  
 HANFORD MUNICIPAL SOLID WASTE LANDFILL  
 KINGS COUNTY  
 NE1/4 OF SECTION 4, T19S, R22E, MDB&M



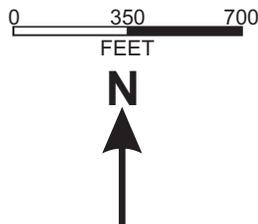
**REGIONAL MAP**

HANFORD-ARMONA ROAD

8TH AVENUE (HWY 43)



- ⊙ GROUNDWATER MONITORING WELL
- ◆ SOIL MOISTURE SENSOR
- ▼ SOIL VAPOR MONITORING WELL
- IRRIGATION WELL
- DOMESTIC WATER WELL
- EXTRACTION WELL



**ATTACHMENT B**

ORDER NO. R5-2014-0086  
 WASTE DISCHARGE REQUIREMENTS  
 FOR  
 KINGS WASTE AND RECYCLING AUTHORITY  
 FOR  
 POSTCLOSURE MAINTENANCE AND CORRECTIVE ACTION  
 HANFORD MUNICIPAL SOLID WASTE LANDFILL  
 KINGS COUNTY

NE 1/4 OF SECTION 4, T19S, R22E, MDB7M. KINGS COUNTY

**SITE MAP**

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2014-0086  
FOR  
KINGS WASTE AND RECYCLING AUTHORITY  
HANFORD MUNICIPAL SOLID WASTE LANDFILL  
POSTCLOSURE MAINTENANCE AND CORRECTIVE ACTION  
KINGS COUNTY

This monitoring and reporting program (MRP) is issued pursuant to California Water Code section 13267 and incorporates requirements for groundwater monitoring and reporting; facility monitoring, maintenance, and reporting; and financial assurances reporting contained in California Code of Regulations, title 27, section 20005, et seq. (hereafter Title 27), Waste Discharge Requirements (WDRs) Order No. R5-2014-0086, and the Standard Provisions and Reporting Requirements (SPRRs) dated January 2012. Compliance with this MRP is ordered by the WDRs and the Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Central Valley Water Board or the Executive Officer.

**A. MONITORING**

The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater in accordance with Standard Monitoring Specifications in Section I of the SPRRs and the Monitoring Specifications in Section F of the WDRs. All monitoring shall be conducted in accordance with the approved November 2002 detection monitoring plan, which includes quality assurance/quality control standards.

All compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard. All detection monitoring program groundwater monitoring wells shall be sampled and analyzed for monitoring parameters and constituents of concern (COCs) as indicated and listed in Tables I, III, and IV.

The Discharger may use alternative analytical test methods, including new USEPA approved methods, provided the methods have method detection limits equal to or lower than the analytical methods specified in this Monitoring and Reporting Program, and are identified in the approved detection monitoring plan.

The monitoring program of this MRP includes:

<u>Section</u>	<u>Monitoring Program</u>
A.1	Groundwater Monitoring
A.2	Unsaturated Zone Monitoring
A.3	Leachate Seep Monitoring
A.4	Facility Monitoring
A.5	Corrective Action Monitoring

### 1. **Groundwater Monitoring**

The Discharger shall operate and maintain a groundwater detection monitoring system that complies with the applicable provisions of Title 27, sections 20415 and 20420. The detection monitoring system shall be certified by a California-licensed professional civil engineer or geologist as meeting the requirements of Title 27. The current groundwater detection monitoring system meets the applicable requirements of Title 27.

The current groundwater monitoring network shall consist of the following:

<u>Well</u>	<u>Status</u>
HL-12	Background
HL-6	Detection
HL-7	Detection
HL-8	Detection
HL-9	Detection
HL-10	Detection
HL-11	Detection
HL-15	Detection
MW-1	Corrective Action
HL-13	Corrective Action
HL-14	Corrective Action

Groundwater samples shall be collected from the background wells, detection monitoring wells, corrective action monitoring wells, and any additional wells added as part of the approved groundwater monitoring system. The collected samples shall be analyzed for the parameters and constituents listed in Table I in accordance with the specified methods and frequencies. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the approved detection monitoring plan. The results of groundwater monitoring shall be reported semiannually as required in Section B.1 of this MRP, below.

**Once per quarter**, the Discharger shall measure the groundwater elevation in each well, determine groundwater flow direction, and estimate groundwater flow rates in the uppermost aquifer and in any zones of perched water and in any

additional portions of the zone of saturation monitored. The results shall be reported semiannually, including the times of expected highest and lowest elevations of the water levels in the wells, pursuant to Title 27, section 20415(e)(15).

Samples collected for the COC monitoring specified in Table I shall be collected and analyzed in accordance with the methods listed in Table IV every five years. Five-year COCs were last monitored in 2010 and shall be monitored again in **2015**. The results shall be reported in the Annual Monitoring Report for the year in which the samples were collected (see B.2 of Reporting of this MRP below).

## **2. Unsaturated Zone Monitoring**

The facility was permitted and in operation before 1 July 1991; therefore, it qualifies for exemption of unsaturated zone monitoring pursuant to Section 20415(d) of Title 27. The Discharger demonstrated that there is no monitoring device or method designed to operate under the existing subsurface conditions and installation of unsaturated zone monitoring devices would require unreasonable dismantling or relocating of permanent structures. Unsaturated zone monitoring is not required.

## **3. Leachate Seep Monitoring**

Leachate that seeps to the surface from a landfill unit shall be sampled and analyzed for the Field and Monitoring Parameters listed in Table II upon detection. The quantity of leachate shall be estimated and reported as Leachate Flow Rate (in gallons/day). Reporting for leachate seeps shall be conducted as required in Section B.3 of this MRP, below.

## **4. Facility Monitoring**

### **a. Annual Facility Inspection**

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess repair and maintenance needed for drainage control systems, cover systems, and groundwater monitoring wells; and shall assess preparedness for winter conditions (including but not limited to erosion and sedimentation control). The Discharger shall take photos of any problems areas before and after repairs. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. Annual facility inspection reporting shall be submitted as required in Section B.4 of this MRP.

b. **Major Storm Events**

The Discharger shall inspect all precipitation, diversion, and drainage facilities and all landfill side slopes for damage **within 7 days** following major storm events capable of causing damage or significant erosion. The Discharger shall take photos of any problems areas before and after repairs. Necessary repairs shall be completed **within 30 days** of the inspection. Notification and reporting requirements for major storm events shall be conducted as required in Section B.5 of this MRP.

c. **Five-Year Iso-Settlement Survey for Closed Units**

For closed landfill units, the Discharger shall conduct a five-year iso-settlement survey and produce an iso-settlement map accurately depicting the estimated total change in elevation of each portion of the final cover's low-hydraulic-conductivity layer. For each portion of the landfill, this map shall show the total lowering of the surface elevation of the final cover, relative to the baseline topographic map [Title 27, section 21090(e)(1 & 2)]. Reporting shall be in accordance with Section B.6 of this MRP. An initial survey was completed in May 1999. Iso-settlement maps for 2004 and 2009 have not been submitted.

d. **Standard Observations**

The Discharger shall conduct Standard Observations at the landfill in accordance with this section of the MRP. Standard observations shall be conducted in accordance with the following schedule:

<u>Frequency</u>	<u>Season</u>
Monthly	Wet: 1 October to 30 April
Quarterly	Dry: 1 May to 30 September

The Standard Observations shall include:

- 1) For the landfill units:
  - a) Evidence of ponded water at any point on the landfill outside of any contact storm water/leachate diversions structures on the active face (show affected area on map); and
  - b) Evidence of erosion and/or of day-lighted refuse.
- 2) Along the perimeter of the landfill units:
  - a) Evidence of leachate seeps, estimated size of affected area, and flow rate (show affected area on map); and
  - b) Evidence of erosion and/or of day-lighted refuse.

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

## **5. Corrective Action Monitoring**

The Discharger shall conduct corrective action monitoring to demonstrate the effectiveness of corrective action in accordance with Title 27, Section 20430 and this MRP. Groundwater monitoring wells that are in a corrective action program (CAP) shall be monitored in accordance with the groundwater monitoring requirements in Section A.1 of this MRP.

Corrective action monitoring data analysis shall include the following:

- a. Nature and Extent:
  - 1) Comparisons with concentration limits to identify any new or previously undetected constituents at a monitoring point.
- b. Effectiveness of Corrective Action:
  - 1) Preparation of time series plots for representative waste constituents.
  - 2) Trend analysis for each waste constituent.
  - 3) The need for additional corrective action measures and/or monitoring wells.

The results of the above analysis, including a narrative discussion, shall be included in each semiannual monitoring report and summarized in the Annual Monitoring Report, as specified under reporting Sections B.1 and B.2 of this MRP below. The semiannual monitoring reports shall also include a discussion of the progress of corrective action toward returning to compliance with the WQPS, as specified in Section 20430(h) of Title 27.

The Discharger shall monitor the influent to the aeration system on a bi-weekly basis for the first 90 days from start-up of the groundwater extraction/aeration system and thereafter on a quarterly basis for the purposes stated in Corrective Action Specification G.2. of the WDRs. The bi-weekly analytical results of influent shall be submitted in the monthly status reports for three months after start-up and the quarterly analytical results of influent shall be submitted in the semiannual monitoring reports. The rate and volume of extracted groundwater shall be monitored on a monthly basis and submitted in the semiannual monitoring reports.

The Discharger shall collect and analyze effluent from the aeration system for VOCs on at least a bi-weekly basis for the first 90 days from start-up of the groundwater extraction/aeration system and then on a quarterly basis thereafter (see Corrective Action Specification G.3. of the WDRs). The bi-weekly analytical results of effluent shall be submitted in the monthly status reports for

the first three months after start-up and the quarterly analytical results of effluent shall be submitted in the semiannual monitoring reports.

The Discharger shall submit monthly status reports on the effectiveness of the proposed extraction/aeration system in remediating ground water for the first 90 days from start-up and thereafter on a quarterly basis (see Corrective Action Specification G.6. of the WDRs). Monthly status reports shall be submitted for the first three months after start-up and the quarterly status reports shall be submitted in the semiannual monitoring reports.

The Discharger shall submit an annual status report that evaluates and summarizes the progress of the proposed corrective action measures (see Corrective Action Specification G.10. of the WDRs). The annual corrective action program status report needs to contain tables showing the concentrations of detected VOCs at groundwater monitoring wells MW-1, HL-13, HL-14, and the Keverline and Martinez domestic wells for each monitoring event beginning with the VOC concentrations at the implementation of the groundwater extraction/aeration system, and time/plot graphs showing stability, decreases, or increases in VOC concentrations at groundwater monitoring wells MW-1, HL-13, HL-14, and the Keverline and Martinez domestic wells. Additionally, the annual status report shall evaluate whether inorganic waste constituents are increasing in groundwater and/or spreading to off-site locations as a result of discharging aeration system effluent to the percolation/evaporation basins, and evaluate whether mounding beneath the percolation/evaporation basins is impacting the monitoring effectiveness of nearby groundwater monitoring wells. The annual status report shall be included in the Annual Monitoring Report.

## B. REPORTING

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

<u>Section</u>	<u>Report</u>	<u>End of Reporting Period</u>	<u>Due Date</u>
B.1	Semiannual Monitoring Report	30 June, 31 December	<b>31 August, 28 February</b>
B.2	Annual Monitoring Report	31 December	<b>28 February</b>
B.3	Seep Reporting	Continuous	<b>Immediately &amp; 7 Days</b>
B.4	Annual Facility Inspection Report	31 October	<b>15 November</b>

<u>Section</u>	<u>Report</u>	<u>End of Reporting Period</u>	<u>Due Date</u>
B.5	Major Storm Event Reporting	Continuous	<b>7 days from damage discovery</b>
B.6	Survey and Iso-Settlement Map for Closed Landfills	Every Five Years	<b>2014 and Every Five Years</b>
B.7	Financial Assurances Report	31 December	<b>1 October</b>

### Reporting Requirements

The Discharger shall submit monitoring reports **semiannually** with the data and information as required in this Monitoring and Reporting Program and as required in WDRs Order No. R5-2014-0086 and the SPRRs (particularly Section I: "Standard Monitoring Specifications" and Section J: "Response to a Release"). In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Data shall also be submitted in a digital format, such as a computer disk.

Field and laboratory tests shall be reported in each monitoring report. Semiannual and annual monitoring reports shall be submitted to the Central Valley Water Board in accordance with the above schedule for the calendar period in which samples were taken or observations made. In addition, the Discharger shall enter all monitoring data and monitoring reports into the online Geotracker database as required by Division 3 of Title 27.

The results of **all monitoring** conducted at the site shall be reported to the Central Valley Water Board in accordance with the reporting schedule above for the calendar period in which samples were taken or observations made.

The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained throughout the life of the facility including the post-closure period. Such records shall be legible and shall show the following for each sample:

- a) Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;

- b) Date, time, and manner of sampling;
- c) Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;
- d) Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
- e) Calculation of results; and
- f) Results of analyses, and the MDL and PQL for each analysis. All peaks shall be reported.

### Required Reports

1. **Semiannual Monitoring Report:** Monitoring reports shall be submitted semiannually and are due on **31 August** and **28 February**. Each semiannual monitoring report shall contain at least the following:
  - a) For each groundwater monitoring point addressed by the report, a description of:
    - 1) The time of water level measurement;
    - 2) The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;
    - 3) The method of purging used to stabilize water in the well bore before the sample is taken including the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; results of pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water;
    - 4) The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and
    - 5) A statement that the sampling procedure was conducted in accordance with the approved Sample Collection and Analysis Plan.
  - b) A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.
  - c) The estimated quarterly groundwater flow rate and direction in the uppermost aquifer, in any zones of perched water, and in any additional zone of saturation monitored based upon water level elevations taken prior to the collection of the water quality data submitted in the report [Title 27, section 20415(e)(15)].
  - d) Cumulative tabulated monitoring data for all monitoring points and constituents for groundwater, unsaturated zone, leachate, and surface water. Concentrations below the laboratory reporting limit shall not be reported as

“ND” unless the reporting limit is also given in the table. Otherwise they shall be reported “<” the reporting limit (e.g., <0.10). Units shall be as required in Tables I through IV unless specific justification is given to report in other units. Refer to the SPRRs Section I “Standard Monitoring Specifications” for requirements regarding MDLs and PQLs.

- e) Laboratory statements of results of all analyses evaluating compliance with requirements.
  - f) An evaluation of the concentration of each monitoring parameter (or 5-year COC when five year COC sampling is conducted) as compared to the current concentration limits, and the results of any required verification testing for constituents exceeding a concentration limit. Report any actions taken under Section J: Response to a Release for verified exceedances of a concentration limit.
  - g) An evaluation of the effectiveness of the run-off/run-on control facilities.
  - h) A summary of all Standard Observations for the reporting period required in Section A.4.d of this MRP.
  - i) A summary of inspection, leak search, and repair of final covers on any closed landfill units in accordance with an approved final post-closure maintenance plan as required by Standard Closure and Post-Closure Maintenance Specifications G.26 through G.29 of the SPRRs.
2. **Annual Monitoring Report:** The Discharger shall submit an Annual Monitoring Report to the Central Valley Water Board by **28 February** covering the reporting period of the previous monitoring year. If desired, the Annual Monitoring Report may be combined with the second semiannual report, but if so, shall clearly state that it is both a semi-annual and annual monitoring report in its title. Each Annual Monitoring Report shall contain the following information:
- a) All monitoring parameters shall be graphed to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous five calendar years. If a 5-year COC event was performed, then these parameters shall also be graphically presented. Each such graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
  - b) An evaluation of the monitoring parameters with regards to the cation/anion balance, and a graphical presentation using a Stiff diagram, a Piper graph, or a Schoeller plot.

- c) All historical monitoring data for which there are detectable results, including data for the previous year, shall be submitted in tabular form in a digital file format such as a computer disk. The Central Valley Water Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [Title 27, section 20420(h)], that facilitates periodic review by the Central Valley Water Board.
  - d) Hydrographs of each well showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be prepared quarterly and submitted annually.
  - e) A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.
  - f) A written summary of the monitoring results, indicating any changes made or observed since the previous Annual Monitoring Report.
  - g) Updated concentration limits for each monitoring parameter at each monitoring well based on the new data set.
  - h) A comprehensive discussion of any Corrective Action Program required by this MRP under Section A.5.
3. **Seep Reporting:** The Discharger shall report by telephone any seepage from the disposal area **immediately** after it is discovered. A written report shall be filed with the Central Valley Water Board **within seven days**, containing at least the following information:
- a) A map showing the location(s) of seepage;
  - b) An estimate of the flow rate;
  - c) A description of the nature of the discharge (e.g., all pertinent observations and analyses);
  - d) Verification that samples have been submitted for analyses of the Field Parameters and Monitoring Parameters listed in Table III of this MRP, and an estimated date that the results will be submitted to the Central Valley Water Board; and
  - e) Corrective measures underway or proposed, and corresponding time schedule.
4. **Annual Facility Inspection Reporting:** By **15 November** of each year, the Discharger shall submit a report describing the results of the inspection and the repair measures implemented, preparations for winter, and include photographs of any problem areas and the repairs. Refer to Section A.4.a of this MRP, above.

5. **Major Storm Event Reporting:** Following major storm events capable of causing damage or significant erosion, the Discharger **immediately** shall notify Central Valley Water Board staff of any damage or significant erosion upon discovery and report subsequent repairs within **14 days** of completion of the repairs, including photographs of the problem and the repairs. Refer to Section A.4.b of this MRP, above.
6. **Survey and Iso-Settlement Map for Closed Landfills:** The Discharger shall conduct a survey and submit an iso-settlement map for each closed area of the landfill every five years pursuant to Title 27, section 21090(e). Refer to Section A.4.c of this MRP, above. The next report is due by **31 October 2014**.
7. **Financial Assurances Report:** By **1 October** of each year, the Discharger shall submit a copy of the annual financial assurances report due to CalRecycle that updates the financial assurances for post-closure maintenance and corrective action. Refer to Financial Assurances Specifications E.1 through E.3 of the WDRs.

## **C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD**

### **1. Water Quality Protection Standard Report**

For each waste management unit, the Water Quality Protection Standard shall consist of all COCs, the concentration limit for each constituent of concern, the verification retesting procedure to confirm measurably significant evidence of a release, the point of compliance, and all water quality monitoring points for each monitored medium.

The Water Quality Protection Standard for naturally occurring waste constituents consists of the COCs, the concentration limits, and the point of compliance and all monitoring points. Any proposed changes to the Water Quality Protection Standard other than annual update of the concentration limits shall be submitted in a report for review and approval.

The report shall:

- a. Identify **all distinct bodies of surface and ground water** that could be affected in the event of a release from a waste management unit or portion of a unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.
- b. Include a map showing the monitoring points and background monitoring points for the groundwater monitoring program. The map shall include the point of compliance in accordance with Title 27, section 20405.

- c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).
- d. Include a proposed statistical method for calculating concentration limits for monitoring parameters and constituents of concern that are detected in 10% or greater of the background data (naturally-occurring constituents) using a statistical procedure from Title 27, section 20415(e)(8)(A-D)] or section 20415(e)(8)(E).
- e. Include a retesting procedure to confirm or deny measurably significant evidence of a release pursuant to Title 27, section 20415(e)(8)(E) and section 20420(j)(1-3).

The Water Quality Protection Standard shall be certified by a California-registered civil engineer or geologist as meeting the requirements of Title 27. If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the site, the Discharger may request modification of the Water Quality Protection Standard.

The Discharger proposed the methods for calculating concentration limits in the 1997 *Water Quality Protection Standard Report Update*. The *Water Quality Protection Standard Report Update* was concurred with by Central Valley Water Board staff in 2001. Pursuant to Title 27 CCR Section 20415(e)(10)(B), for each naturally occurring inorganic COC, the concentration limit (applicable suite of background data) for that constituent shall be redetermined each semiannual monitoring period according to the following "moving window" formula. For each reporting period subsequent to the initial reporting period, the Discharger shall create the new concentration limit, for that constituent, by taking the prior reporting period's background data, adding the newest datum, for that constituent, from background monitoring wells and removing the oldest datum. Monitoring well HL-12 is currently being used for the collection of background data.

The WQPS shall be updated, at a minimum, every five years; or as required by natural changes in background water quality.

The concentration limits for each constituent of concern are as follows:

- a. For anthropogenic (not naturally occurring) constituents, which have no natural, and therefore, no background values, the concentration limit (water quality protection standard) shall be the detection limit of the analytical method(s) used.
- b. For each naturally occurring inorganic waste constituent of concern, the concentration limit (applicable suite of background data) for that

constituent shall be determined utilizing the inter-well tolerance limit method and groundwater statistical analysis computer program by Sanitas™. The upper tolerance limit shall be calculated from inorganic monitoring data obtained from background monitoring well HL-12 and the concentrations of inorganic constituents from downgradient compliance wells compared to the upper tolerance levels. The analytical data from each sampling event shall be used to update the tolerance limits.

## **2. Monitoring Parameters**

Monitoring parameters are a select group of constituents that are monitored during each monitoring event that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a waste management unit. The monitoring parameters for all waste management units are those listed in Tables I through III for the specified monitored medium.

## **3. Constituents of Concern (COCs)**

The COCs include a larger group of waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the waste management unit, and are required to be monitored every five years [Title 27, sections 20395 and 20420(g)]. The COCs for all waste management units at the facility are those listed in Tables I, III and Table IV for the specified monitored medium. The Discharger shall monitor all COCs every five years, or more frequently as required in accordance with a Corrective Action Program. The last 5-year COC report was submitted to the Central Valley Water Board in the 2010 *Annual Monitoring Report*, and 5-year COCs are due to be monitored again in **2015**.

## **4. Concentration Limits**

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

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

## **5. Retesting Procedures for Confirming Evidence of a Release**

If monitoring results indicate measurably significant evidence of a release, as described in Standard Monitoring Specification I.45 of the SPRRs, then:

- a. For analytes that are detected in less than 10% of the background samples (such as non-naturally occurring constituents), the Discharger shall use the non-statistical retesting procedure required in Standard Monitoring Specification I.46 of the SPRRs.
- b. For analytes that are detected in 10% or greater of the background samples (naturally occurring constituents), the Discharger shall use one of the statistical retesting procedure as required in Standard Monitoring Specification I.47 of the SPRRs.

## **6. Point of Compliance**

The point of compliance for the water standard at each waste management unit is a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the unit.

## **7. Compliance Period**

The compliance period for each waste management unit shall be the number of years equal to the active life of the unit plus the closure period. The compliance period is the minimum period during which the Discharger shall conduct a water quality monitoring program subsequent to a release from the waste management unit. The compliance period shall begin anew each time the Discharger initiates an evaluation monitoring program [Title 27, section 20410].

## **8. Monitoring Points**

A monitoring point is a well, device, or location specified in the waste discharge requirements, which monitoring is conducted and at which the water quality protection standard applies. The monitoring points for each monitored medium are listed in Section A of this MRP.

## **D. TRANSMITTAL LETTER FOR ALL REPORTS**

A transmittal letter explaining the essential points shall accompany each report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted, and if the violations were corrected. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter. The transmittal letter shall also state that a discussion of any violations found since the last report was submitted, and a description of the actions taken or planned for correcting those violations, including any references to previously submitted time schedules, is contained in the accompanying report. The transmittal letter shall contain a statement by the discharger, or the discharger's authorized agent, under penalty of perjury, that to the best of the signer's knowledge the report is true, accurate, and complete.

The Discharger shall implement the above monitoring program on the effective date of this Program.

*Original signed by:*

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

\_\_\_\_\_ 6 June 2014  
(Date)

**TABLE I**  
**GROUNDWATER DETECTION MONITORING PROGRAM**

<u>Parameter</u>	<u>Units</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
<b>Field Parameters</b>			
Groundwater Elevation	Ft. & 100ths, M.S.L.	Quarterly	Semiannual
Temperature	°F	Semiannual	Semiannual
Electrical Conductivity	µmhos/cm	Semiannual	Semiannual
pH	pH units	Semiannual	Semiannual
Turbidity	Turbidity units	Semiannual	Semiannual
<b>Monitoring Parameters</b>			
Total Dissolved Solids (TDS)	mg/L <sup>1</sup>	Semiannual	Semiannual
Chloride	mg/L	Semiannual	Semiannual
Carbonate	mg/L	Semiannual	Semiannual
Bicarbonate	mg/L	Semiannual	Semiannual
Nitrate - Nitrogen	mg/L	Semiannual	Semiannual
Sulfate	mg/L	Semiannual	Semiannual
Calcium	mg/L	Semiannual	Semiannual
Magnesium	mg/L	Semiannual	Semiannual
Potassium	mg/L	Semiannual	Semiannual
Sodium	mg/L	Semiannual	Semiannual
Volatile Organic Compounds (USEPA Method 8260B, short list, see Table V)	µg/L <sup>2</sup>	Semiannual	Semiannual
<b>5-Year Constituents of Concern (see Table VI)</b>			
Total Organic Carbon	mg/L	5 years	5 years
Inorganics (dissolved)	µg/L	5 years	5 years
Volatile Organic Compounds (USEPA Method 8260, extended list)	µg/L	5 years	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years	5 years

<sup>1</sup> Milligrams per liter

<sup>2</sup> Micrograms per liter

**TABLE II**  
**SEEP MONITORING <sup>1</sup>**

<u>Parameter</u>	<u>Units</u>
<b>Field Parameters</b>	
Total Flow	Gallons
Flow Rate	Gallons/Day
Electrical Conductivity	µmhos/cm
pH	pH units
<b>Monitoring Parameters</b>	
Total Dissolved Solids (TDS)	mg/L
Chloride	mg/L
Carbonate	mg/L
Bicarbonate	mg/L
Nitrate - Nitrogen	mg/L
Sulfate	mg/L
Calcium	mg/L
Magnesium	mg/L
Potassium	mg/L
Sodium	mg/L
Volatile Organic Compounds (USEPA Method 8260, short list, see Table III)	µg/L

<sup>1</sup> Leachate seeps shall be sampled and analyzed for the Field and Monitoring Parameters in this table upon detection. The quantity of leachate shall be estimated and reported in gallons/day. Also, refer to Section B.3

### TABLE III

## MONITORING PARAMETERS FOR DETECTION MONITORING

### Surrogates for Metallic Constituents:

pH  
Total Dissolved Solids  
Electrical Conductivity  
Chloride  
Sulfate  
Nitrate nitrogen

### Volatile Organic Compounds, short list:

#### **USEPA Method 8260B**

Acetone  
Acrylonitrile  
Benzene  
Bromochloromethane  
Bromodichloromethane  
Bromoform (Tribromomethane)  
Carbon disulfide  
Carbon tetrachloride  
Chlorobenzene  
Chloroethane (Ethyl chloride)  
Chloroform (Trichloromethane)  
Dibromochloromethane (Chlorodibromomethane)  
1,2-Dibromo-3-chloropropane (DBCP)  
1,2-Dibromoethane (Ethylene dibromide; EDB)  
o-Dichlorobenzene (1,2-Dichlorobenzene)  
m-Dichlorobenzene (1,3-Dichlorobenzene)  
p-Dichlorobenzene (1,4-Dichlorobenzene)  
trans-1,4-Dichloro-2-butene  
Dichlorodifluoromethane (CFC-12)  
1,1-Dichloroethane (Ethylidene chloride)  
1,2-Dichloroethane (Ethylene dichloride)  
1,1 -Dichloroethylene (1,1 -Dichloroethene; Vinylidene chloride)  
cis-1,2-Dichloroethylene (cis-1,2-Dichloroethene)  
trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene)  
1,2-Dichloropropane (Propylene dichloride)  
cis-1,3-Dichloropropene  
trans-1,3-Dichloropropene  
Di-isopropylether (DIPE)  
Ethanol  
Ethyltertiary butyl ether  
Ethylbenzene  
2-Hexanone (Methyl butyl ketone)  
Hexachlorobutadiene  
Methyl bromide (Bromomethene)  
Methyl chloride (Chloromethane)

**TABLE III**  
**MONITORING PARAMETERS FOR DETECTION MONITORING**

**Continued**

Methylene bromide (Dibromomethane)  
Methylene chloride (Dichloromethane)  
Methyl ethyl ketone (MEK: 2-Butanone)  
Methyl iodide (Iodomethane)  
Methyl t-butyl ether  
4-Methyl-2-pentanone (Methyl isobutylketone)  
Naphthalene  
Styrene  
Tertiary amyl methyl ether  
Tertiary butyl alcohol  
1,1,1,2-Tetrachloroethane  
1,1,2,2-Tetrachloroethane  
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)  
Toluene  
1,2,4-Trichlorobenzene  
1,1,1-Trichloroethane (Methylchloroform)  
1,1,2-Trichloroethane  
Trichloroethylene (Trichloroethene)  
Trichlorofluoromethane (CFC- 11)  
1,2,3-Trichloropropane  
Vinyl acetate  
Vinyl chloride  
Xylenes

**TABLE IV**  
**5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS**

<b><u>Inorganics (dissolved):</u></b>	<b><u>USEPA Method</u></b>
Aluminum	6010
Antimony	7041
Barium	6010
Beryllium	6010
Cadmium	7131A
Chromium	6010
Cobalt	6010
Copper	6010
Silver	6010
Tin	6010
Vanadium	6010
Zinc	6010
Iron	6010
Manganese	6010
Arsenic	7062
Lead	7421
Mercury	7470A
Nickel	7521
Selenium	7742
Thallium	7841
Cyanide	9010C
Sulfide	9030B

**Volatile Organic Compounds, extended list:**

**USEPA Method 8260B**

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

**TABLE IV**

**5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS**

**Continued**

m-Dichlorobenzene (1,3-Dichlorobenzene)  
p-Dichlorobenzene (1,4-Dichlorobenzene)  
trans- 1,4-Dichloro-2-butene  
Dichlorodifluoromethane (CFC 12)  
1,1 -Dichloroethane (Ethylidene chloride)  
1,2-Dichloroethane (Ethylene dichloride)  
1,1 -Dichloroethylene (1, I-Dichloroethene; Vinylidene chloride)  
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)  
trans- 1,2-Dichloroethylene (trans- 1,2-Dichloroethene)  
1,2-Dichloropropane (Propylene dichloride)  
1,3-Dichloropropane (Trimethylene dichloride)  
2,2-Dichloropropane (Isopropylidene chloride)  
1,1 -Dichloropropene  
cis- 1,3-Dichloropropene  
trans- 1,3-Dichloropropene  
Di-isopropylether (DIPE)  
Ethanol  
Ethyltertiary butyl ether  
Ethylbenzene  
Ethyl methacrylate  
Hexachlorobutadiene  
2-Hexanone (Methyl butyl ketone)  
Isobutyl alcohol  
Methacrylonitrile  
Methyl bromide (Bromomethane)  
Methyl chloride (Chloromethane)  
Methyl ethyl ketone (MEK; 2-Butanone)  
Methyl iodide (Iodomethane)  
Methyl t-butyl ether  
Methyl methacrylate  
4-Methyl-2-pentanone (Methyl isobutyl ketone)  
Methylene bromide (Dibromomethane)  
Methylene chloride (Dichloromethane)  
Naphthalene  
Propionitrile (Ethyl cyanide)  
Styrene  
Tertiary amyl methyl ether  
Tertiary butyl alcohol  
1,1,1,2-Tetrachloroethane  
1,1,2,2-Tetrachloroethane  
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene; PCE)  
Toluene  
1,2,4-Trichlorobenzene  
1,1,1 -Trichloroethane (Methylchloroform)  
1,1,2-Trichloroethane

## TABLE IV

### 5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

#### Continued

Trichloroethylene (Trichloroethene; TCE)  
Trichlorofluoromethane (CFC- 11)  
1,2,3-Trichloropropane  
Vinyl acetate  
Vinyl chloride (Chloroethene)  
Xylene (total)

#### Semi-Volatile Organic Compounds:

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

Acenaphthene  
Acenaphthylene  
Acetophenone  
2-Acetylaminofluorene (2-AAF)  
Aldrin  
4-Aminobiphenyl  
Anthracene  
Benzo[a]anthracene (Benzanthracene)  
Benzo[b]fluoranthene  
Benzo[k]fluoranthene  
Benzo[g,h,i]perylene  
Benzo[a]pyrene  
Benzyl alcohol  
Bis(2-ethylhexyl) phthalate  
alpha-BHC  
beta-BHC  
delta-BHC  
gamma-BHC (Lindane)  
Bis(2-chloroethoxy)methane  
Bis(2-chloroethyl) ether (Dichloroethyl ether)  
Bis(2-chloro-1-methylethyl) ether (Bis(2-chloroisopropyl) ether; DCIP)  
4-Bromophenyl phenyl ether  
Butyl benzyl phthalate (Benzyl butyl phthalate)  
Chlordane  
p-Chloroaniline  
Chlorobenzilate  
p-Chloro-m-cresol (4-Chloro-3-methylphenol)  
2-Chloronaphthalene  
2-Chlorophenol  
4-Chlorophenyl phenyl ether  
Chrysene  
o-Cresol (2-methylphenol)  
m-Cresol (3-methylphenol)  
p-Cresol (4-methylphenol)  
4,4'-DDD  
4,4'-DDE

**TABLE IV**

**5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS**

**Continued**

4,4'-DDT  
Diallate  
Dibenz[a,h]anthracene  
Dibenzofuran  
Di-n-butyl phthalate  
3,3'-Dichlorobenzidine  
2,4-Dichlorophenol  
2,6-Dichlorophenol  
Dieldrin  
Diethyl phthalate  
p-(Dimethylamino)azobenzene  
7,12-Dimethylbenz[a]anthracene  
3,3'-Dimethylbenzidine  
2,4-Dimethylphenol (m-Xylenol)  
Dimethyl phthalate  
m-Dinitrobenzene  
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)  
2,4-Dinitrophenol  
2,4-Dinitrotoluene  
2,6-Dinitrotoluene  
Di-n-octyl phthalate  
Diphenylamine  
Endosulfan I  
Endosulfan II  
Endosulfan sulfate  
Endrin  
Endrin aldehyde  
Ethyl methanesulfonate  
Famphur  
Fluoranthene  
Fluorene  
Heptachlor  
Heptachlor epoxide  
Hexachlorobenzene  
Hexachlorocyclopentadiene  
Hexachloroethane  
Hexachloropropene  
Indeno(1,2,3-c,d)pyrene  
Isodrin  
Isophorone  
Isosafrole  
Kepone  
Methapyrilene  
Methoxychlor  
3-Methylcholanthrene  
Methyl methanesulfonate  
2-Methylnaphthalene

**TABLE IV**

**5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS**

**Continued**

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

**TABLE IV**

**5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS**

**Continued**

**Chlorophenoxy Herbicides:**

**USEPA Method 8151A**

2,4-D (2,4-Dichlorophenoxyacetic acid)

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

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

2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)

**Organophosphorus Compounds:**

**USEPA Method 8141B**

Atrazine

Chlorpyrifos

0,0-Diethyl 0-2-pyrazinyl phosphorothioate (Thionazin)

Diazinon

Dimethoate

Disulfoton

Methyl parathion (Parathion methyl)

Parathion

Phorate

Simazine

## INFORMATION SHEET

ORDER R5-2014-0086  
KINGS WASTE AND RECYCLING AUTHORITY  
POSTCLOSURE MAINTENANCE AND CORRECTIVE ACTION  
HANFORD MUNICIPAL SOLID WASTE LANDFILL  
KINGS COUNTY

The Kings Waste and Recycling Authority (hereafter Discharger) owns and maintains a closed, unlined, municipal solid waste landfill (facility) about 2.5 miles southwest of the City of Hanford in Kings County.

The California Regional Water Quality Control Board (Central Valley Water Board) adopted Waste Discharge Requirements (WDRs) Order No. R5-2007-0154 (Order R5-2007-0154) on 26 October 2007, which classified the waste management unit (Unit) as a Class III landfill as defined in Title 27, California Code of Regulations, section 20005 et seq. (hereafter Title 27), that accepts or accepted municipal solid waste. The proposed Order revises the existing WDRs to provide for postclosure maintenance and to implement a corrective action program.

The 96.4-acre facility contains one closed unlined Unit that covers 79 acres. The Discharger does not propose expansion. The facility accepted waste from 1973 through 1998.

The facility is located within the southern portion of the San Joaquin Valley approximately 2.5 miles southwest of the City of Hanford. The facility is underlain by 6,000 of valley-fill sediments that result from alluvial, fluvial, lacustrine, and marine depositional processes.

The first encountered groundwater beneath the facility ranges between 121 and 131 feet below ground surface (bgs) depending on location at the facility. Groundwater elevations range between 123 and 116 feet above mean seas level (MSL) depending on location at the facility. The first encountered groundwater is unconfined. The depth to groundwater fluctuates seasonally as much as 25 to 30 feet. Background, detection, and corrective action groundwater monitoring wells are screened in the unconfined groundwater zone.

Unsaturated zone detection monitoring for leachate is not being conducted at the facility. Installing an unsaturated zone monitoring system for leachate (i.e., lysimeters) beneath the Unit at this time would not be practical based on the fact the existing Unit is closed, unlined without a leachate collection and removal system (LCRS), and has already released waste constituents to groundwater.

Volatile organic compounds (VOCs) have been detected in unconfined groundwater along the southern, western, and northwestern point of compliance. The VOCs detected in groundwater are: acetone; benzene, cis-1,2-dichloroethene (cis-1,2-DCE); trichlorofluoromethane (CFC-11); dichlorodifluoromethane (CFC-12); tetrachloroethene (PCE); trichloroethane (TCE); 1,1-dichloroethane (1,1-DCA); 1,1-dichloroethene (1,1-DCE); methylene chloride; trans-1,2-dichloroethene (trans-1,2-DCE); vinyl chloride; and 1,1,1-trichloroethane to groundwater. The latest self-monitoring report (Second Semiannual Monitoring Report, 2012) detected: CFC-12; 1,1-DCA; 1,1-DCE; cis-1,2-DCE; TCE; PCE; CFC-11; and vinyl chloride in point of compliance and corrective action groundwater monitoring wells. Based on analytical results from

samples collected from LFG monitoring wells, degradation by VOCs in groundwater beneath the Unit, especially the northwestern corner of the Unit where VOC concentrations are the highest, is attributed to LFG migration.

Inorganic waste constituents detected in point of compliance groundwater monitoring wells at concentrations statistically exceeding their respective background concentrations include: bicarbonate; carbonate; sulfate; total dissolved solids (TDS); calcium; magnesium; and potassium. The latest self-monitoring report (Second Semiannual Monitoring Report, 2012) detected: calcium; sulfate; and TDS in point of compliance groundwater monitoring wells at levels statistically exceeding their respective background concentrations. No inorganic waste constituent exceedences of background concentrations occurred at corrective action groundwater monitoring wells.

The Discharger's evaluation monitoring program (EMP) adequately determined the nature and lateral and vertical extent of the release and the EMP was deemed complete on 15 May 2002. Total VOC concentrations at the point of compliance and off-site locations ranged upward to 55 micrograms/liter. However, either PCE, TCE, and/or vinyl chloride exceeded their respective Maximum Contaminant Level (MCL) at point of compliance wells HL-7 and HL-8 and evaluation monitoring well HL-13. Currently, PCE exceeds its MCL at point of compliance well HL-6 and extraction well EX-2 near the Unit's northwestern point of compliance. Analytical data from evaluation groundwater monitoring determined that the lateral extent of the VOC plume was approximately 1,500 feet west of the Unit, 750 feet southwest of the Unit; approximately 200 feet north of the Unit; and approximately 100 feet east and south of the Unit. The vertical extent of the VOC plume appeared to be approximately 202 feet bgs. The lateral and vertical extent of inorganic waste constituents in groundwater fell within the VOC plume boundary.

A revised corrective action program (CAP) was submitted on 19 February 2013. The Discharger's revised CAP proposes a five-year pilot test utilizing a groundwater extraction/aeration system to remediate VOCs in groundwater and control the hydraulically downgradient migration of VOCs in groundwater. Proposed is that groundwater would initially be extracted from extraction well EX-2, which is located along the western point of compliance and pumped into four 10,000-gallon above-ground tanks for aeration. However, the number of extraction wells is subject to change. Once it is determined that the extraction/aeration system is removing VOCs from the extracted groundwater, the Discharger will evaluate whether additional site groundwater extraction wells should be added to the CAP. The aeration system would consist of a float-based aerator, and possibly more, placed inside each of the above-ground tanks to volatilize VOCs to nondetectable concentrations. Initiation of groundwater extraction was proposed for extraction well EX-2 where the most significant concentrations of total VOCs in groundwater have been detected. Following aeration, the treated groundwater would be discharged to one or more on-site evaporation/percolation basins. Additionally, the Discharger proposes increasing LFG extraction in the northwestern portion of the Unit where VOC concentrations in groundwater and LFG are the highest to control VOC migration to groundwater.

The Discharger completed construction of an engineered alternative composite final cover system in October 1999. The final cover system is comprised, in ascending order: of a 12-inch thick foundation layer placed over an existing six-to-12-inch thick intermediate cover; a non-reinforced geosynthetic clay layer; and an 18-inch thick vegetative layer. Additionally, a landfill gas (LFG) extraction system was installed to remove and thermally destroy LFG. Postclosure maintenance includes inspection, maintenance, and monitoring of the landfill during the postclosure maintenance period, and includes a postclosure maintenance cost estimate for the entire facility.

This order requires full containment of wastes and does not permit degradation of surface water or groundwater. Further, antidegradation analysis is therefore not needed. The discharge is consistent with the antidegradation provisions of State Water Resources Control Board Resolution 68-16.