

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2004-0023

WASTE DISCHARGE REQUIREMENTS
FOR
COUNTY OF SACRAMENTO, PUBLIC WORKS AGENCY
AND
U.S. ARMY CORPS OF ENGINEERS
GRAND ISLAND CLASS III LANDFILL
POST CLOSURE MAINTENANCE
SACRAMENTO COUNTY

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

1. The Grand Island Class III Landfill is a closed 10.4-acre disposal site, comprised of Assessor Parcel Number 142-013-013. The land was leased to and operated by the County of Sacramento, Public Works Agency and is owned by the U.S. Army Corps of Engineers (jointly hereafter referred to as Discharger). The site is located at the western end of Grand Island, in Section 21, T4N, R3E, MDB&M, as shown in Attachment A, which is incorporated herein and made part of this Order.
2. The landfill operated from 1971 to 1979 serving the communities of Walnut Grove, Locke, Isleton, and the surrounding county area. The landfill received final closure in 1998.
3. The landfill is subject to the requirements of Title 23 California Code of Regulations (CCR), Division 3, Chapter 15 (Chapter 15). As of 18 July 1997, the Chapter 15 regulations that apply to the landfill are found in Title 27, CCR. The requirements of Title 40, Code of Federal Regulations (CFR) Part 258, Subtitle D do not apply to the landfill since it did not receive waste after 9 October 1991 (per 40 CFR Part 258.1(c)).
4. On 5 November 2003, the Discharger submitted an amended Report of Waste Discharge (RWD) requesting a reduction in the frequency of landfill gas monitoring from monthly to semi-annually. The frequency of landfill gas monitoring is as required in Monitoring and Reporting Program (MRP) No. R5-2004-0023, which is incorporated herein and made part of this Order. Other revisions of this Order have been made based on new information available since the adopted on previous Waste Discharge Requirements (WDRs) Order No. 89-017 as part of a required 15-year update.

WASTES AND THEIR CLASSIFICATION

5. The landfill used a trench disposal operation to receive ordinary household and commercial waste (municipal solid waste) that is classified as 'nonhazardous solid waste' using the criteria set forth in Title 27, CCR. The Regional Board classified the disposal site as Class III landfill in previous WDRs Order No. 89-017.

SITE DESCRIPTION

6. Land within 1000 feet of the site is used for agriculture, recreation and residential housing.
7. Rainfall and evaporation data was reported by the Discharger in a 1988 report as follows: the maximum annual precipitation is 27.34 inches recorded at Rio Vista in 1941, three miles west-southwest of the landfill; the 100-year, 24-hour storm event is 5.52 inches for the Georgiana Slough Bridge, five miles northeast of the site; normal annual precipitation is 17.10 inches per year (1951 to 1980) at the Sacramento Weather Station 30 miles north-northeast of the site; isohyetal maps indicate that the normal annual precipitation for the site is approximately 17 inches; the mean Pan A evaporation is 79.53 inches recorded at Brannan Island, two miles south of the site; the Sacramento area receives 90% of its precipitation between November and April.
8. The nearest reported earthquake epicenter of magnitude of 4.0 or greater is 22 miles west of Sacramento. The Midland Fault is located (inferred) approximately 3,000 feet west of the landfill, and is reported to be capable of producing an earthquake of up to magnitude 7 on the Richter Scale.
9. The first water-bearing formation consists of a narrow layer of silty sand and begins at an elevation of approximately 2 feet above mean sea level (MSL), residing above an organic clay layer. A second water-bearing zone consisting of silty sand resides below the clay layer beginning at an elevation of approximately 18 feet below MSL (roughly 25 feet below surface grade). Groundwater measurements in monitoring wells screened in these formations indicate the piezometric groundwater elevations typically reside between 2 feet above and 3 feet below MSL.
10. The landfill is underlain by alluvial deposits associated with the Sacramento River system. These deposits consist primarily of peat and sand with lesser amounts of unconsolidated gravel, silt, and clay.
11. The beneficial uses of ground water are domestic, municipal, agricultural, and industrial supply.
12. The landfill is in the floodplain of the Sacramento River and is protected from flooding by levees. These levees form the outer edge of Grand Island and are maintained by the U.S. Army Corps of Engineers and/or Reclamation District No. 3.
13. Following final closure in 1998, surface water drainage from the landfill area is to the surrounding wooded areas adjacent to the landfill. The Discharger has reported that surface water from the landfill area does not drain to any surface water bodies.

14. Groundwater at the site is greatly influenced by the Sacramento River located adjacent to the landfill, separated by the levee. The Discharger is required to conduct surface water monitoring in the adjacent Sacramento River to assess water quality in the river relative to groundwater quality at the landfill.
15. The beneficial uses of surface water are domestic, municipal, agricultural, and industrial supply; groundwater recharge; recreation; esthetic enjoyment; navigation; fresh water replenishment; and preservation and enhancement of fish, wildlife, and other aquatic resources.

LANDFILL CLOSURE AND FINAL COVER CONSTRUCTION

16. Previous WDRs Order No. 89-017 required the landfill to receive a final cover that consists of a two-foot thick foundation layer, overlain by a one-foot thick clay layer with hydraulic conductivity less than 1×10^{-6} cm/s, and a one-foot thick vegetative soil layer. Order No. 89-017 also allowed an engineered alternative final cover, pursuant to Subchapter 15 (now Title 27).
17. The landfill is not lined; however, a final cover was constructed over the landfill in 1998 to provide drainage away from the surface of the landfill and to reduce percolation of rainwater into the waste and the formation of leachate. The final cover consists of one foot of compacted low permeability soil having hydraulic conductivity less than 1×10^{-5} cm/s, and vegetation. The final cover design was approved in a 23 March 1993 Regional Board staff letter following a demonstration by the Discharger that regrading the landfill surface to drain and installation of the proposed soil cover would provide adequate protection for groundwater by reducing infiltration by 80 percent. The approval was based, in part, in that groundwater monitoring indicated that the landfill had not impacted water quality during the period since it had ceased accepting waste in 1979, and the Discharger's argument that the higher cost to import low permeability soil for the clay layer was economically infeasible relative to the threat to water quality.
18. Final cover was placed over 10.4 acres of the site during August through October 1998. According to the 5 March 1999 *Final Construction Quality Assurance Report* (Final CQA Report), pertinent activities conducted during the final closure included:
 - Excavation of refuse located outside of the limits of the cover;
 - Excavation and placement of general fill borrow soil;
 - Testing and importation of low permeability cover soil;
 - Placement and compaction of excavated refuse, general fill soil and low permeability cover soil;
 - Installation of drainage ditches, survey monuments and bollards;
 - Revegetation of the low permeability cover layer; and
 - Installation of landfill gas monitoring probes.

19. Testing results reported by the Discharger in the Final CQA Report indicate that the actual permeability of the one-foot thick soil cover ranges from 2.2×10^{-6} cm/s to 1.3×10^{-8} cm/s.

GROUNDWATER, SURFACE WATER AND UNSATURATED ZONE MONITORING

20. The groundwater monitoring network consists of three monitoring wells (MW-1 through MW-3) completed in the shallow water bearing zone, and five monitoring wells (MW-4 through MW-6) completed in the deeper water bearing zone, as shown on Attachment B. As requested by the Discharger, monitoring wells MW-7 and MW-8 have been eliminated from the groundwater monitoring network.. Monitoring well MW-7 is located generally cross-gradient to the landfill, and MW-8 is located 1,600 feet downgradient from the landfill beyond other down-gradient monitoring wells. This Order requires monitoring wells MW-7 and MW-8 to be maintained for possible future characterization of groundwater in the event of a release from the landfill.
21. Measurements of depth to groundwater in the monitoring wells indicates that groundwater flow direction is generally to the northeast, away from the Sacramento River.
22. Following the issuance of revised MRP No. 89-017 in December 1999, concentration limits for constituents-of-concern have been calculated for the deeper water bearing zone using an intra-well statistical analysis. The revised MRP approved this analysis method based on information submitted by the Discharger indicating that there is spatial variability for sulfate, magnesium, calcium and sodium in groundwater around the landfill. The information presented by the Discharger also indicated that the landfill was not impacting groundwater at that time. MRP No. R5-2004-0023 continues to require intra-well analysis for calculation of concentration limits for the deeper water-bearing zone. This and other monitoring requirements can be changed with Executive Officer approval if MRP No. R5-2004-0023 is revised in the future.
23. Surface water monitoring is required at the downstream location R-1 in the Sacramento River, as shown on Attachment B. This requirement is necessary to assess any influence the landfill may have on the river via groundwater flow beneath the levee.
24. The Discharger installed three landfill gas monitoring probes (LFG-1 through LFG-3) in the unsaturated zone during closure in 1998. Revised MRP No. 89-017 required monthly monitoring of the landfill gas for methane, carbon dioxide and oxygen. These measurements have not indicated the presence of landfill gas. The Discharger requested a reduction in frequency of landfill gas monitoring in the 5 November 2003 amended RWD. MRP No. R5-2004-0023 requires semi-annual monitoring of landfill gas.

FINANCIAL ASSURANCE

25. Section 22222 of Title 27, CCR requires the Discharger to establish an irrevocable fund for corrective action to address a known or reasonably foreseeable release from the landfill. This Order requires the Discharger to submit a cost estimate and proposed financial assurance mechanism for corrective action of a reasonably foreseeable release from the landfill.
26. Section 22212 of Title 27, CCR requires the Discharger to establish an irrevocable fund to ensure post-closure maintenance at the landfill. This Order requires the Discharger to submit a cost estimate and proposed financial assurance mechanism for 30-years of post-closure maintenance.

CEQA AND OTHER CONSIDERATIONS

27. The action to revise waste discharge requirements (WDRs) for this facility is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21000, et seq.), in accordance with Section 15301, Title 14, CCR.
28. This Order implements:
 - a. The Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin, Fourth Edition; and
 - b. The prescriptive standards and performance goals of Chapters 1 through 7, Subdivision 1, Division 2, Title 27 of the California Code of Regulations, and subsequent revisions.
29. Section 13267(b) of California Water Code 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 discharging, or who proposed to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who had discharged, discharges, or is suspected of discharging, or who proposed to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports." The monitoring and reporting program required by this Order and the attached Monitoring and Reporting Program No. ____ are necessary to assure compliance with these waste discharge requirements. The Discharger operates the facility that discharges the waste subject to this Order.

PROCEDURAL REQUIREMENTS

30. The Regional Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
31. In a public hearing, the Board heard and considered all comments pertaining to this facility and discharge.
32. Any person affected by this action of the Regional Board may petition the State Water Resources Control Board to review the action in accordance with Sections 2050 through 2068, Title 23, California Code of Regulations. The petition must be received by the State Water Resources Control Board, Office of Chief Counsel, P.O. Box 100, Sacramento, California 95812, within 30 days of the date of issuance of this Order. Copies of the laws and regulations applicable to the filing of a petition are available on the Internet at http://www.swrcb.ca.gov/water_laws/index.html and will be provided on request.

IT IS HEREBY ORDERED that Order No. 78-252 and Order No. 89-017 are rescinded and Sacramento County, its agents, assigns, and successors, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

A. DISCHARGE PROHIBITIONS:

1. The discharge of any new waste at the Grand Island Class III Landfill facility is prohibited.
2. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses or to ground water, is prohibited.

B. FACILITY SPECIFICATIONS:

Protection from Storm Events

1. The Class III landfill shall be maintained to prevent inundation or washout due to floods with a 100-year return period. The Class III landfill unit and related containment structures shall be constructed and maintained to prevent, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping under 100-year, 24-hour precipitation conditions.
2. Precipitation and drainage control systems shall be designed and constructed to accommodate the anticipated volume of precipitation and peak flows from surface runoff under 100-year, 24-hour precipitation conditions.

3. Surface drainage from tributary areas and internal site drainage from surface or subsurface sources shall not contact or percolate through wastes.
4. Annually, prior to the anticipated rainy season, any necessary erosion control measures shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent erosion or flooding of the site and to prevent surface drainage from contacting or percolating through wastes.
5. Each facility groundwater monitoring well shall be locked to prevent unauthorized access and shall be equipped with a watertight well cap at the top of the well casing to prevent surface water infiltration in the event that the well is submerged during periods of flooding.

Post-Closure Maintenance

6. During the closure and post-closure maintenance period, the Discharger shall conduct routine maintenance of the final cover, areas with interim cover, the precipitation and drainage control facilities, and the groundwater and landfill gas monitoring systems.
7. The Discharger shall, in a timely manner, repair any areas of the final cover that have been damaged by erosion, cracking, differential settlement, subsidence or any other causes that could allow ponding of surface water or percolation of surface water into the wastes.
8. Prior to and during the rainy season, the Discharger shall perform any and all necessary reseeding of the final cover to maintain adequate vegetation.
9. Each facility monitoring well and landfill gas probe shall be maintained to prevent surface water infiltration and unauthorized access until such time that it is properly abandoned following Regional Board staff approval of a work plan for monitoring well or landfill gas probe abandonment.

Unsaturated Zone Monitoring

10. As an alternate method of unsaturated zone monitoring allowed under §20415(d)(4) of Title 27, CCR, the Discharger shall monitor landfill gas probes for the presence of methane, carbon dioxide, oxygen, and volatile organic compounds as required by MRP No. R5-2004-0023.

C. FINANCIAL ASSURANCE

1. The Discharger shall submit a cost estimate for corrective action of all known or reasonably foreseeable releases from the landfill by **1 April 2004**. Following Regional Board staff approval of the cost estimate, the Discharger shall obtain and maintain adequate assurances of financial responsibility for initiating and completing corrective action for all known and reasonably foreseeable releases from a waste management unit at the facility in accordance with Sections 20380(b) and 22222 of Title 27, CCR.
2. The Discharger shall submit a cost estimate for 30-years of post-closure maintenance of the landfill by **1 April 2004**. Following Regional Board staff approval of the cost estimate, the Discharger shall obtain and maintain adequate assurances of financial responsibility for post-closure maintenance at the facility in accordance with Section 22212 of Title 27, CCR.

D. PROVISIONS:

1. The Discharger shall comply with the Standard Provisions and Monitoring Requirements, dated August 1997, which are hereby incorporated into and made part of this Order. A violation of any of the standard Provisions and Reporting Requirements is a violation of these WDRs.
2. The Discharger shall comply with Monitoring and Reporting Program No. R5-2004-0023. A violation of any of the provisions of the MRP is a violation of these WDRs.
3. The Discharger shall, in a timely manner, remove and relocate any waste discharged at this facility in violation of this order.
4. A copy of this Order shall be kept at the administrative offices of the Waste Management & Recycling Division for reference by operations and maintenance personnel, who shall be familiar with its contents.
5. In the event of any change in ownership of this waste management facility, the Discharger shall notify the succeeding owner or operator in writing of the existence of this Order. A copy of that notification shall be sent to the Board.
6. The Discharger shall maintain engineering drawings of the topography of the site at the completion of final closure, October 1998. Further, the Discharger shall create and maintain records of modifications and repairs to the surface of the cover and related drainage facilities throughout the post closure maintenance period. Such records shall also include documentation of proper disposal of any waste material removed from the site as a consequence of repairs. Such records shall be maintained at the office of the Solid Waste Management Division, Sacramento County, until the

- end of the post-closure maintenance period. These records shall be available for review by representatives of the Board at any time during normal business hours. At the end of the post-closure maintenance period, copies of these records shall be sent to the Regional Board.
7. The Discharger shall immediately notify the Board of any flooding, equipment failure, slope failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or of precipitation and drainage control structures.
 8. The post-closure maintenance period shall continue until the Board determines that remaining waste in the WMU(s) will not threaten water quality.
 9. The Discharger shall maintain waste containment facilities and precipitation and drainage controls, and shall continue to monitor ground water, the vadose zone, and surface waters, per MRP No. R5-2004-0023 throughout the post-closure maintenance period.
 10. The Discharger has the continuing responsibility to assure protection of usable waters from discharged wastes and gases and leachate generated by discharged waste during the active life, closure, and post-closure maintenance period of the Class III Landfill and during subsequent use of the property for other purposes.
 11. The Discharger shall comply with all applicable provisions of Title 27 CCR that are not specifically referred to in this Order.
 12. The Board will review this Order periodically and will revise the WDRs when necessary.

I, THOMAS R. PINKOS, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 30 January 2004.

Original signed by

THOMAS R. PINKOS, Executive Officer

Attachments
WLB

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2004-0023
FOR
COUNTY OF SACRAMENTO, PUBLIC WORKS AGENCY
AND
U.S. ARMY CORPS OF ENGINEERS
GRAND ISLAND CLASS III LANDFILL
POST CLOSURE MAINTENANCE
SACRAMENTO COUNTY

The Discharger shall maintain water quality monitoring systems that comply with the provisions of Title 27, California Code of Regulations (CCR), Division 2, Subdivision 1, Chapter 3, Subchapter 3, and are appropriate for detection monitoring, evaluation monitoring, and corrective action monitoring.

Monitoring and Reporting Program (MRP) No. R5-2004-0023, including Attachments A, B and C, and the Standard Provisions and Reporting Requirements (Standard Provisions), dated August 1997, are part of Waste Discharge Requirements (WDRs) Order No. R5-2004-0023. WDRs No. R5-2004-0023 and the Standard Provisions require compliance with this MRP. Failure to comply with this MRP, or with the Standard Provisions, constitutes non-compliance with the WDRs and with the Water Code, which can result in the imposition of civil monetary liability.

A. MONITORING

1. Groundwater Monitoring

The Discharger shall sample groundwater from shallow monitoring wells MW-2, MW-3; from deeper monitoring wells MW-4, MW-5 and MW-6, and from any other monitoring wells currently at the facility; and from any other monitoring wells (deep or shallow) that are installed after the effective date of this MRP. Locations of each of the monitoring wells are illustrated on Attachment B. The Discharger shall collect samples from the groundwater monitoring wells as specified in Table 1, except that monitoring wells MW-2 and MW-3 shall be sampled and analyzed for Field Parameters and volatile organic compounds only unless additional Constituents-of-Concern are required to be sampled pursuant to an indication of a release from the landfill. Sample collection shall follow standard EPA protocol.

For each monitored groundwater body, the Discharger shall measure the water level in each shallow and deep monitoring well (in feet and hundredths, MSL) and determine groundwater gradient and direction at least semi-annually, including the times of expected highest and lowest water level elevations for the respective groundwater body. Groundwater elevations shall be measured for a given groundwater body within a period of time short enough to avoid temporal groundwater flow variations which could preclude accurate determination of groundwater gradient and direction.

The Discharger shall sample each Monitoring Point for annual Monitoring Parameters and five-year Constituent of Concern during the second half of 2005. Subsequent monitoring of five year Constituents-of-Concern for groundwater shall be completed every fifth year after the year 2000, alternating the first and second half of the year beginning with the first half of 2010.

TABLE 1 - GROUNDWATER MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Test Method</u>	<u>Frequency</u>
Field Parameters			
Temperature	°F	Field Measure	Semi-Annual
Groundwater Elevation	Feet (100ths), MSL	Field Measure	Semi-Annual
Specific Conductance	µmhos/cm	Field Measure	Semi-Annual
pH	Number	Field Measure	Semi-Annual
Monitoring Parameters			
Bicarbonate	mg/l	EPA 310.1	Semi-Annual
Calcium	mg/l	EPA 6010	Semi-Annual
Chloride	mg/l	EPA 300.0	Semi-Annual
Chemical Oxygen Demand	mg/l	EPA 410.4	Semi-Annual
Dissolved Iron	mg/l	EPA 6010	Semi-Annual
Magnesium	mg/l	EPA 6010	Semi-Annual
Manganese	mg/l	EPA 601 0	Semi-Annual
Nitrate-Nitrogen	mg/l	EPA 300.0	Semi-Annual
Sodium	mg/l	EPA 6010	Semi-Annual
Sulfate	mg/l	EPA 300.0	Semi-Annual
Sulfides	mg/l	EPA 9030	Semi-Annual
Total Dissolved Solids	mg/l	EPA 160.1	Semi-Annual
Volatile Organic Compounds (See Attachment C)	µg/l	EPA 8260B	Semi-Annual
Metals/General Mineral ¹	mg/l	Footnotes 1	Annually
Constituents-of-Concern			
Total Organic Carbon	mg/l	EPA 415.1	5 years
Metals/General Mineral ²	mg/l	Footnotes 2	5 years
¹ Metals/General Mineral (by EPA 6010 except where noted): Aluminum, Arsenic (EPA 7061), Cadmium, Chromium (Total), Chromium 6+ (EPA 7197), Copper, Lead (EPA 7421), Mercury (EPA 7470), Nickel (EPA 7520), Potassium, Selenium (EPA 7741), Silver, and Zinc.			
² Metals/General Mineral (by EPA 6010 except where noted): Antimony, Barium, Beryllium, Thallium (EPA 7841), Tin, and Vanadium.			

2. Landfill Gas Monitoring

The Discharger shall monitor landfill gas monitoring probes LFG-1, LFG-2 and LFG-3 **semi-annually** for methane, carbon dioxide, and oxygen. Locations of the landfill gas monitoring probes are illustrated on Attachment B. If methane is detected in a landfill gas monitoring probe at a concentration of greater than or equal to 1% methane, the Discharger shall collect a landfill gas sample in a summa canister for analysis of VOCs using Method TO-14. If VOCs are detected in the landfill gas sample, the Discharger shall collect a groundwater sample from the nearest shallow monitoring well (MW-1, MW-2, or MW-3) for analysis of VOCs. Any detection of VOCs in landfill gas or groundwater shall be reported to the Board upon receipt of the laboratory results.

B. REPORTING

The Discharger shall report monitoring data and information as required in this MRP and as required in the Standard Provisions. Reports which do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in non-compliance with the WDRs.

1. Semi-Annual Reports

The Discharger shall report field and laboratory test results in semi-annual monitoring reports. The Discharger shall submit the semi-annual monitoring reports to the Board by the **15 July** for monitoring conducted between 1 January and 30 June of each year, and by **31 January** of the following year for monitoring data collected between 1 July and 31 December of each year. The Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The Discharger shall summarize the data to clearly illustrate compliance with waste discharge requirements or the lack thereof. A short discussion of the monitoring results, including notations of any water quality violations, shall precede the tabular summaries. As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all reports shall be prepared by a registered professional or their subordinate and signed by the registered professional.

Each semi-annual report is to include the following minimum information:

- (a) tabulated cumulative monitoring data including depth to groundwater measurements, groundwater elevations above mean sea level, groundwater analytical data, Concentration Limits from the most recent annual report, and landfill gas monitoring data;
- (b) a groundwater contour map for the current quarter's groundwater elevation data showing hydraulic gradient and flow direction;
- (c) a copy of the laboratory analytical reports; and
- (d) if applicable, the status of any ongoing remediation, including all applicable data.

2. Annual Report

The semi-annual report for the second half of each year shall also constitute the annual report for that year. The annual report shall contain both tabular and graphical summaries of the monitoring data, so as to show historical trends, and shall propose Concentration Limits for each Constituent of Concern in each monitored medium. The Discharger shall report to the Board the results of any monitoring done more frequently than specified herein.

Each annual report is to include the following minimum information:

- (a) tabular and graphical summaries of all data obtained during the previous year;
- (b) groundwater contour maps for the previous year's groundwater elevation data showing hydraulic gradients and flow directions;
- (c) a discussion of the long-term trends in the concentrations of any pollutants in groundwater;
- (d) if applicable, a description of all remedial activities including effectiveness and proposed changes or modifications in remedial action;
- (e) an updated Water Quality Protection Standard including proposed Concentration Limits for all Constituents-of-Concern and Monitoring Parameters; and
- (f) a trend analysis for each monitored parameter in each well such that gradually increasing concentrations are not missed by annually updated Concentration Limits.

C. WATER QUALITY PROTECTION STANDARD

The Water Quality Protection Standard (Standard) shall consist of the following elements:

1. Constituents-of-Concern;
2. Concentration Limits;
3. Monitoring Points;
4. Point of Compliance; and
5. Compliance Period.

Each of these is described as follows:

1. Constituents-of-Concern

The list of Constituents-of-Concern shall include all parameters listed in Table 1 of this MRP.

2. Concentration Limits

The Discharger has demonstrated that spatial variability for various constituents exists in groundwater underlying the landfill, and that this spatial variability may be associated with the distance of each monitoring well from the Sacramento River. Therefore, the Discharger shall use intrawell comparisons for determining Concentration Limits for each Constituent of Concern or Monitoring Parameter in each groundwater monitoring well.

As required by revised MRP No. 89-017, the Discharger selected a statistical method for determining intrawell Concentration Limits for each naturally occurring Constituent of Concern. The statistical method selected by the Discharger is the Tolerance Interval Method using the 95 percent upper tolerance limit. The Discharger also uses the Coefficient of Variation test to test the normality of the data set. For data sets that contain non-detects, the Discharger performs the following:

- (a) if the proportion of non-detects is less than 15 percent, each non-detect is replaced with one-half the detection limit;
- (b) if the proportion of non-detects is between 15 and 50 percent, Cohen's adjustment is used; and
- (c) if the proportion of non-detects exceeds 50 percent, the Test of Proportions is applied.

On an annual basis, updated Concentration Limits shall be calculated for all Constituents-of-Concern for which there is sufficient data using the selected methods summarized above. Additionally, a trend analysis shall also be performed for each parameter in each well to check for gradual increases in concentrations that might indicate a release that would otherwise be overlooked due to use of the more recent data in calculating the updated limits.

If the Discharger finds that the concentration of one or more of the Monitoring Parameters or Constituents-of-Concern have exceeded the approved Concentration Limit(s), the Discharger shall perform the tasks outlined in the Standard Provisions.

3. Monitoring Points

Deep Water Bearing Zone

The detection groundwater Monitoring Points for the deep water bearing zone shall be groundwater monitoring wells MW-4, MW-5 and MW-6 and any future groundwater monitoring wells that may be installed for purposes of detection monitoring in the deep zone. Monitoring wells MW-7 and MW-8 shall be maintained for possible future characterization of groundwater in the event of a release from the landfill and for additional piezometric monitoring of groundwater elevations.

Shallow Water Bearing Zone

The detection groundwater Monitoring Points for the shallow water bearing zone shall be monitoring wells MW-2, MW-3, and any future groundwater monitoring wells that may be installed for purposes of detection monitoring in the shallow zone. For the purposes of semi-

annual monitoring, monitoring well MW-1 shall be used as a piezometer, unless VOCs are detected in landfill gas monitoring probe LFG-2.

Landfill Gas

The detection landfill gas Monitoring Points shall be landfill gas monitoring probes LFG-1, LFG-2, LFG-3, and any future landfill gas monitoring probes that may be installed for purposes of detection of landfill gas.

Surface Water

Surface water monitoring is no longer required at the site, except at location R-1 in the Sacramento River as shown on Attachment B. Surface water drainage from the landfill final cover does not flow to any surface water bodies.

4. Point of Compliance

The Point of Compliance for groundwater and for landfill gas shall be the vertical surface located at the hydraulically downgradient limit of the waste management units that extends through the uppermost aquifer underlying the units.

5. Compliance Period

The Compliance Period is the number of years equal to the active life of the waste management unit plus at least three consecutive years of compliance with the Water Quality Protection Standard (as described in Title 27, Section 20410).

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

Original signed by
Ordered by: _____
THOMAS R. PINKOS, Executive Officer

30 January 2004
Date

WLB

INFORMATION SHEET

ORDER NO. R5-2004-0023
COUNTY OF SACRAMENTO, PUBLIC WORKS AGENCY
AND U.S. ARMY CORPS OF ENGINEERS
GRAND ISLAND CLASS III LANDFILL
POST CLOSURE MAINTENANCE
SACRAMENTO COUNTY

Grand Island Class III Landfill is a closed 10.4-acre disposal site located at the western end of Grand Island. The land was leased the County of Sacramento, Public Works Agency (the Operator) and is owned by the U.S. Army Corps of Engineers (jointly hereafter referred to as Discharger). The landfill operated from 1971 to 1979 serving the communities of Walnut Grove, Locke, Isleton, and the surrounding county area. The landfill received final closure in 1998, and is subject to the solid waste regulations of Title 27 California Code of Regulations (CCR).

The landfill closure consisted of grading the surface of the landfill to drain, and the installation of a final cover consisting of one foot of compacted low permeability soil having hydraulic conductivity less than 1×10^{-5} cm/s, and vegetation. Actual permeability testing performed during closure indicates the cover soil has permeability ranging from 2.2×10^{-6} cm/s to 1.3×10^{-8} cm/s. Three landfill gas monitoring probes were also installed during closure.

The landfill is located immediately adjacent to the Sacramento River, separated by the outer levee of Grand Island. The first water-bearing formation consists of a narrow layer of silty sand and begins at an elevation of approximately 2 feet above mean sea level (MSL), residing above an organic clay layer. A second water-bearing zone consisting of silty sand resides below the clay layer beginning at an elevation of approximately 18 feet below MSL (roughly 25 feet below surface grade). Groundwater measurements in monitoring wells screened in these formations indicate the piezometric groundwater elevations typically reside between 2 feet above and 3 feet below MSL. Groundwater monitoring is conducted at the landfill on a semi-annual basis. The groundwater monitoring network consists of three monitoring wells (MW-1 through MW-3) completed in the shallow water bearing zone, and five monitoring wells (MW-4 through MW-8) completed in the deeper water bearing zone. Groundwater monitoring has not indicated impacts from the landfill. This Order requires continued semi-annual monitoring of groundwater at wells MW-2 through MW-6; the Sacramento River downstream of the landfill; and monitoring for landfill gas as provided in the Monitoring and Reporting Program.

Following final closure in 1998, surface water drainage from the landfill area is to the surrounding wooded areas adjacent to the landfill. The Discharger has reported that surface water from the landfill area does not drain to any surface water bodies.

30 January 2004
WLB

ATTACHMENT C

Volatile Organic Compounds (by 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)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans-1,4-Dichloro-2-butene
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
Ethylbenzene
2-Hexanone (Methyl butyl ketone)
Methyl bromide (Bromomethane)
Methyl chloride (Chloromethane)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Methyl ethyl ketone (MEK; 2-Butanone)
Methyl iodide (Iodomethane)
4-Methyl-2-pentanone (Methyl isobutylketone)
Methyl tertiary butyl ether
Styrene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
Toluene
1,1,1-Trichloroethane (Methylchloroform)
1,1,2-Trichloroethane

ATTACHMENT C - Continued

Trichloroethylene (Trichloroethene)

Trichlorofluoromethane (CFC-11)

1,2,3-Trichloropropane

Vinyl acetate

Vinyl chloride

Xylenes