

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2003-0046

FOR  
COUNTY OF SACRAMENTO, PUBLIC WORKS AGENCY  
ELK GROVE CLASS III LANDFILL  
POST CLOSURE MAINTENANCE AND CORRECTIVE ACTION  
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.

Revised Monitoring and Reporting Program (MRP) No. R5-2003-0046, including Attachments A, B C and D and the Standard Provisions and Reporting Requirements (Standard Provisions), dated August 1997, are part of Waste Discharge Requirements (WDRs) Order No. R5-2003-0046. WDRs Order No. R5-2003-0046 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 each groundwater Monitoring Point listed in Section C.3 of this MRP (locations shown on Attachment B), and any other monitoring wells installed after adoption of these WDRs. The Discharger shall collect samples from the groundwater Monitoring Points as specified in Table 1. Sample collection shall follow standard EPA protocol.

For each monitored groundwater body, the Discharger shall measure the water level in each well (in feet and hundredths, MSL) and determine groundwater gradient and direction at least quarterly, 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.

Monitoring of five year Constituents of Concern for groundwater shall be completed every fifth year, alternating the first and third quarters. The next five-year monitoring event shall be conducted during third quarter of 2005.

**2. Surface Water Monitoring**

The Discharger shall sample Laguna Creek at surface water Monitoring Points R-1, R-2, R-3 and R-4 (as shown on Attachment B). The Discharger shall collect surface water samples after the first storm of the rainy season which produces significant flow and during at least one other storm event in the wet season. The Discharger shall collect samples from each station as specified in Table 2. Sample collection shall follow standard EPA procedures.

Monitoring of five year Constituents of Concern for groundwater shall be completed every fifth year during the first quarter. The next five-year monitoring event shall be conducted during the first quarter of 2005.

**3. Groundwater Extraction Well Monitoring**

The Discharger shall monitor extraction wells EW-5 and EW-6 in accordance with Table 3. Samples shall be collected and analyzed both prior to and after treatment for each extraction well at the specified frequencies. Any future extraction wells that are installed shall also be monitored as specified in Table 3.

**4. Unsaturated Zone Monitoring**

The Discharger shall monitor on-site and off-site landfill gas probes for the presence of methane and carbon dioxide.

**TABLE 1 – GROUNDWATER MONITORING PROGRAM**

<u>Parameter</u>	<u>Units</u>	<u>Test Method</u>	<u>Frequency</u>
<b>Field Parameters</b>			
Temperature	°F	Field Measure	Quarterly
Groundwater Elevation	Feet (100ths), MSL	Field Measure	Quarterly
Specific Conductance	µmhos/cm	Field Measure	Quarterly
pH	Number	Field Measure	Quarterly
Turbidity	NTU	Field Measure	Quarterly
<b>Monitoring Parameters</b>			
Bicarbonate	mg/l	EPA 310.1	Quarterly
Carbonate	mg/l	EPA 403	Quarterly
Chloride	mg/l	EPA 300.0	Quarterly
Chemical Oxygen Demand	mg/l	EPA 410.4	Quarterly
Dissolved Iron	mg/l	EPA 6010	Quarterly
Magnesium	mg/l	EPA 6010	Quarterly
Manganese	mg/l	EPA 6010	Quarterly
Nitrate-Nitrogen	mg/l	EPA 300.0	Quarterly
Sulfate	mg/l	EPA 300.0	Quarterly
Total Dissolved Solids	mg/l	EPA 160.1	Quarterly
Volatile Organic Compounds (See Attachment C)	µg/l	EPA 8260B	Quarterly <sup>1</sup>
Semi-Volatile Organic Compounds (See Attachment D)	µg/l	EPA 8270B	Annually
Metals/General Mineral <sup>2</sup>	µg/l	Footnote 2	Annually
<b>Constituents of Concern</b>			
Total Organic Carbon	mg/l	EPA 415.1	5 years
Metals/General Mineral <sup>3</sup>	mg/l	Footnote 3	5 years

<sup>1</sup> VOCs **Monthly** for monitoring well MW-6 and MW-10. Piezometer MW-5 is required to be sampled only for VOCs on a quarterly basis and is not required to be sampled for other constituents.

<sup>2</sup> Metals/General Mineral (by EPA 6010 except where noted): Arsenic (EPA 7061), Cadmium, Chromium (Total), Chromium 6+ (EPA 7197), Copper, Lead (EPA 7421), Mercury (EPA 7470), Nickel (EPA 7520), Selenium (EPA 7741), Silver, and Zinc.

<sup>3</sup> Metals/General Mineral (by EPA 6010 except where noted): Aluminum, Antimony, Barium, Beryllium, Calcium, Potassium, Sodium, Sulfides (9030), Thallium (EPA 7841), Tin, and Vanadium.

**TABLE 2 - SURFACE WATER MONITORING PROGRAM**

<u>Parameter</u>	<u>Units</u>	<u>Test Method</u>	<u>Frequency</u>
<b>Field Parameters</b>			
pH	Number	Field Measure	Each Winter <sup>1</sup>
Specific Conductance	µmhos/cm	Field Measure	Each Winter <sup>1</sup>
Temperature	°F	Field Measure	Each Winter <sup>1</sup>
Turbidity	NTU	Field Measure	Each Winter <sup>1</sup>
<b>Monitoring Parameters</b>			
Chloride	mg/l	EPA 300.0	Each Winter <sup>1</sup>
Chemical Oxygen Demand	mg/l	EPA 410.4	Each Winter <sup>1</sup>
Dissolved Iron	mg/l	EPA 6010	Each Winter <sup>1</sup>
Nitrate-Nitrogen	mg/l	EPA 300.0	Each Winter <sup>1</sup>
Manganese	mg/l	EPA 6010	Each Winter <sup>1</sup>
Magnesium	mg/l	EPA 6010	Each Winter <sup>1</sup>
Sulfate	mg/l	EPA 300.0	Each Winter <sup>1</sup>
Total Dissolved Solids	mg/l	EPA 160.1	Each Winter <sup>1</sup>
Total Suspended Solids	mg/l	EPA 160.2	Each Winter <sup>1</sup>
<b>Constituents of Concern</b>			
Total Organic Carbon	mg/l	EPA 415.1	5 years
Metals/General Mineral <sup>2</sup>	µg/l	Footnote 2	5 years

<sup>1</sup> The first storm of the rainy season and at least one other storm event during the wet season.

<sup>2</sup> Metals/General Mineral (by EPA 6010 except where noted): Aluminum, Antimony, Arsenic (EPA 7061), Barium, Beryllium, Cadmium, Calcium, Chromium (Total), Chromium 6+ (EPA 7197), Cobalt, Copper, Cyanide, Iron, Lead (EPA 7421), Manganese, Mercury (EPA 7470), Nickel (EPA 7520), Potassium, Selenium (EPA 7741), Silver, Sodium, Sulfides (9030), Thallium (EPA 7841), Tin, Vanadium, and Zinc.

**TABLE 3 – GROUNDWATER EXTRACTION WELL MONITORING PROGRAM**

<u>Parameter</u>	<u>Units</u>	<u>Test Method</u>	<u>Frequency</u>
<b>Field Parameters</b>			
pH	Number	Field Measure	Quarterly <sup>1</sup>
Specific Conductance	µmhos/cm	Field Measure	Quarterly <sup>1</sup>
Temperature	°F	Field Measure	Quarterly <sup>1</sup>
<b>Monitoring Parameters</b>			
Bicarbonate	mg/l	EPA 310.1	Quarterly <sup>1</sup>
Chloride	mg/l	EPA 300.0	Quarterly <sup>1</sup>
Sulfate	mg/l	EPA 300.0	Quarterly <sup>1</sup>
Total Dissolved Solids	mg/l	EPA 160.1	Quarterly <sup>1</sup>
Volatile Organic Compounds (See Attachment C)	µg/l	EPA 8260B <sup>4</sup>	Various <sup>1,2,5</sup>
Semi-Volatile Organic Compounds (See Attachment D)	µg/l	EPA 8270B	Various <sup>1,3</sup>

<sup>1</sup> Pre-treatment samples from each active extraction well shall be monitored **monthly** for the first three months after the extraction well is brought on-line and **quarterly** thereafter.

<sup>2</sup> The treated effluent from each active extraction well shall be monitored for VOCs **weekly** for the first 3 months after the extraction well is brought on-line and sampling may be reduced to **twice monthly** after three months of weekly data have been collected. If any VOC exceeds the Practical Quantitation Limit (PQL) for a sample of treated groundwater, weekly monitoring shall be resumed until two consecutive samples are below the PQL. Trace detections below the PQL must be flagged.

<sup>3</sup> The treated effluent from each active extraction well shall be monitored for SVOCs **weekly** for the first 2 weeks after the extraction well is brought on-line and sampling may be reduced to **quarterly** after two weeks data have been collected. If any SVOC exceeds the Practical Quantitation Limit (PQL) for a sample of treated groundwater, weekly monitoring shall be resumed until two consecutive samples are below the PQL. Trace detections below the PQL must be flagged.

<sup>4</sup> EPA Method 502.2 may be substituted for Method 8260B.

<sup>5</sup> Extraction wells EW-1 and EW-4 shall be monitored **quarterly** for VOCs only unless groundwater extraction is initiated in these wells.

## 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. Quarterly Reports

The Discharger shall report field and laboratory test results in quarterly monitoring reports. The Discharger shall submit the quarterly monitoring reports to the Board by the **15th day of the month** following the calendar quarter in which the samples were collected or observations made, with the exception of the annual report due by 31 January (**i.e., by 15 April, 15 July, 15 October, and 31 January 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 quarterly report is to include the information listed in the Standard Provisions as well as:

- (a) tabulated cumulative monitoring data including depth to groundwater measurements, groundwater elevations above mean sea level, groundwater, surface water, and unsaturated zone analytical data, and Concentration Limits;
- (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) the status of any ongoing remediation, including all applicable data.

### 2. Annual Report

The fourth quarter report shall also constitute the annual report for the previous calendar year. The annual report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous twelve months, 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 information listed in the Standard Provisions as well as:

- (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 and/or surface water;
- (d) a description of all remedial activities including effectiveness and proposed changes or modifications in remedial action; and
- (e) if applicable, an updated Water Quality Protection Standard including proposed Concentration Limits for all Constituents of Concern.

### **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 (groundwater and surface water);
- 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 Tables 1, 2 and 3 of this MRP.

#### **2. Concentration Limits**

##### Groundwater:

The Concentration Limits for **groundwater** shall be those calculated by the Discharger from historical data at former background monitoring well MW-1. Groundwater at monitoring well MW-1 has been impacted by the landfill and is therefore no longer representative of background groundwater quality. The Concentration Limits for groundwater shall be as follows:

<u>Constituent</u>	<u>Units</u>	<u>Concentration Limit</u>
Bicarbonate	mg/L	287

Carbonate	mg/L	20
Chloride	mg/L	9.9
Chemical Oxygen Demand	mg/L	20
Magnesium	mg/L	17.5
Manganese	mg/L	0.050
Nitrate	mg/L	1.5
Sulfate	mg/L	6.8
Total Dissolved Solids	mg/L	290
Arsenic	µg/L	6
Cadmium	µg/L	10
Chromium	µg/L	20
Hexavalent Chromium	µg/L	10
Copper	µg/L	230
Lead	µg/L	100
Mercury	µg/L	0.2
Nickel	µg/L	20
Selenium	µg/L	5
Silver	µg/L	10
Zinc	µg/L	160
Acetone	µg/L	10
2-Butanone	µg/L	10
Dichlorodifluoromethane	µg/L	1
Tetrachloroethene	µg/L	0.06
Vinyl Chloride	µg/L	0.05
All other VOCs	µg/L	0.5
All SVOCs	µg/L	Practical Quantitation Limit

If the Discharger finds that the concentration of one or more Constituents of Concern have exceeded the above Concentration Limit(s) for groundwater, the Discharger shall perform the tasks outlined under the heading “**RESPONSE TO A RELEASE**” in the Standard Provisions.

Surface Water:

The Discharger shall determine the Concentration Limit for each Constituent of Concern or Monitoring Parameter for surface water. The Discharger shall use the Concentration Limits as the basis of comparison with data from the detection Monitoring Point for surface water (R-2). Background surface water Monitoring Point (R-1) shall be used to establish Concentration Limits for each naturally occurring Constituent of Concern.

On an annual basis, surface water Concentration Limits shall be updated for all Constituents of Concern for which there is sufficient data.

If the Discharger finds that the concentration of one or more Constituents of Concern have exceeded the Concentration Limit(s) for surface water, the Discharger shall perform



the tasks outlined under the heading “**RESPONSE TO A RELEASE**” in the Standard Provisions.

### 3. **Monitoring Points**

The **groundwater** Monitoring Points shall be:

Background: Former background groundwater monitoring well MW-1 has been impacted and is no longer representative of background groundwater quality. Historical data from MW-1, prior to impacts, is now used to establish background groundwater quality for the facility.

Detection Monitoring: The detection monitoring wells for groundwater shall be monitoring wells MW-9 (deep), MW-10, MW-11, MW-12 and any other detection monitoring wells installed after the adoption of this Order.

Corrective Action Monitoring: The corrective action monitoring wells for groundwater shall be MW-1 through MW-6, MW-7R and MW-8. These wells shall remain in the corrective action monitoring program until such time as monitoring data indicates that they are no longer impacted (all constituents of concern fall below concentration limits established by this Order) at which time they will move to the detection monitoring program.

The **surface water** Monitoring Points shall be:

Background:

R-1 In the Laguna Creek channel 20 feet downstream from the crossing of Laguna Creek under Waterman Road. R-1 shall be the background surface water Monitoring Point.

Detection:

R-2 In the Laguna Creek channel 2,500 feet downstream from the crossing of Laguna Creek under Waterman Road. R-2 shall be the detection surface water Monitoring Point.

Drainage Outfall:

R-3 The southern landfill surface drainage outfall adjacent to Laguna Creek.

R-4 The northern landfill surface drainage outfall adjacent to Laguna Creek.

### 4. **Point of Compliance**

The Point of Compliance for groundwater and the unsaturated zone 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. The Point of Compliance for surface water shall be the site property line.

**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.

Ordered by: \_\_\_\_\_  
THOMAS R. PINKOS, Executive Officer

14 March 2003

\_\_\_\_\_  
Date

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER NO. R5-2003-0046

WASTE DISCHARGE REQUIREMENTS  
FOR  
COUNTY OF SACRAMENTO, PUBLIC WORKS AGENCY  
ELK GROVE CLASS III LANDFILL  
POST CLOSURE MAINTENANCE AND CORRECTIVE ACTION  
SACRAMENTO COUNTY

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

1. The Elk Grove Class III Landfill is a closed 37-acre disposal site, comprised of Assessor Parcel Numbers 127-160-12 and 127-160-14, and is owned by the County of Sacramento, Public Works Agency (hereafter referred to as Discharger). The site is located in Elk Grove, in Section 31, T7N, R6E, MDB&M, as shown in Attachment A, which is incorporated herein and made part of this Order.
2. The Elk Grove Landfill was previously known as the Waterman Disposal site. The landfill received final closure in 1992, under the requirements of Title 23 California Code of Regulations (CCR), Division 3, Chapter 15 (Chapter 15). As of 18 July 1997, these regulations are found in Title 27, CCR. Since the landfill received final closure prior to 10 October 1993, only the closure requirements of Title 40, Code of Federal Regulations (CFR) Part 258, Subtitle D apply to the landfill.
3. The landfill was operated by Independent Disposal Service for approximately 17 years until 1978, when the site was deactivated. Approximately 930,000 cubic yards of waste have been disposed of at the site.
4. The Service Area included the communities of Elk Grove, Galt, Walnut Grove, Thornton, Locke, and the general public in the surrounding County area south of Calvine Road.
5. On 27 November 2002, the Discharger submitted an amended Report of Waste Discharge (RWD). The amended RWD provides data and information regarding corrective action for impacts to groundwater at the site, and requests formal Regional Board approval to discharge treated groundwater into the vadose zone at groundwater extraction well locations. Corrective action and discharge to the vadose zone are described in later findings of this Order.

**WASTES AND THEIR CLASSIFICATION**

6. The Class III 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 discharge consisted of residential and

commercial waste, white goods, street sweepings, tires, woodwastes, construction demolition, and dead animals.

### **SITE DESCRIPTION**

7. Land within 1000 feet of the site is used for agriculture, residential housing, grazing, and a cemetery.
8. The surface soils in the area of the Elk Grove Landfill are predominantly Arroyo Seco Gravel, which extend to a maximum depth of 20 feet. Regional geology consists of the erosional ridge of exposed Laguna formation surrounded by the adjacent plains and stream channels underlain by younger unconsolidated alluvium and Riverbank formation. Information on geology directly beneath the landfill is outlined in the *Ground Water Monitoring Facilities and Baseline Water Quality Results* report dated September 1989. Four test borings beneath the landfill encountered solely the Laguna formation, below the landfill waste or cover soil. The report designated three members within the Laguna formation. The uppermost Laguna member consists of reddish clayey sand and gravel to a depth of up to 40 feet below surface grade (bsg). The underlying middle member extends to a depth of about 180 feet bsg and consists of weakly compacted silty clays with interbedded thin sandy beds. The sandy beds of this member are less than 15 feet thick and are variable in their sand size distribution. Below a depth of about 180 feet bsg, a more massive, silty clay is found, which has been informally referred to as the lower member of the Laguna formation.
9. No major seismic faults transect Sacramento County. The nearest reported earthquake epicenter of magnitude 4.0 or greater is 22 miles west of Sacramento.
10. The first water-bearing formation is approximately 100 feet below the base of the landfill. The direction of ground water flow is generally to the west and southwest at an average hydraulic gradient of approximately 0.004. The ground water is semi-confined by the silty clays. Seasonal fluctuations in ground water elevation average about 8 feet and range from 1 to 14 feet.
11. The beneficial uses of ground water are domestic, municipal, agricultural, and industrial supply.
12. A portion of the site is within the 100-year floodplain. However, rock slope protection has been placed along a portion of the Class III Landfill to prevent inundation or washout of the waste management unit due to floods with a 100-year return period.
13. The Landfill is at an elevation of 57 feet MSL with average annual precipitation of approximately 17 inches (Isohyetal map (1966)); the 100-year, 24-hour storm is 4.32 inches; the maximum annual precipitation recorded at the Sacramento City National

Weather Station was 35.54 in 1862; 90% of the precipitation falls in this area between November and April.

14. The nearest evaporation station is approximately two miles west of the Landfill site at an elevation of 23 feet MSL. Data gathered for this evaporation station indicates a mean annual Pan A evaporation of 57.08 inches; maximum mean monthly evaporation of 9.33 inches occurs in July; the minimum mean monthly evaporation of 0.79 inches occurs in December; however, these figure represent only two years of data. The data from an evaporation station located 30 miles west-northwest of the site, providing 54 years of data, indicate a mean annual Pan A evaporation of 73.43 inches; maximum mean monthly evaporation of 11.69 inches during July; and minimum mean monthly evaporation of 1.30 inches during December.
15. Surface drainage is to Laguna Creek, which is tributary to Morrison Creek, which flows into the Sacramento River and the Sacramento-San Joaquin Delta.
16. The beneficial uses of surface waters are domestic, municipal, agricultural, and industrial supply; ground water recharge; recreation; esthetic enjoyment; navigation; fresh water replenishment; and preservation and enhancement of fish, wildlife, and other aquatic resources.

#### **WASTE MANAGEMENT UNIT CONSTRUCTION**

17. The landfill is not lined; however, a final cover was constructed over the landfill to prevent rainwater from percolating through the waste and forming leachate.
18. Final cover was placed over 32.3 acres of the site during September 1992. According to the *Report of Compliance* the final cover consists of a two-foot thick foundation layer, a one-foot thick low permeability layer ( $<1 \times 10^{-6}$  cm/second), a vapor barrier (10 mil PVC), a one-foot thick soil cover sloped at a minimum of 3 percent, and vegetation.
19. A paved bicycle/horse trail was subsequently constructed adjacent to the western edge of the landfill next to Laguna Creek at the request of the Elk Grove Community Services District. The vegetative soil layer was removed from a 1.1-acre area at the northern end of the landfill and replaced with a layer of compacted soil to accommodate a parking lot for access to the trail. Following an inspection during 2001, Regional Board staff requested that the Discharger take measures to protect the cover soil in this area due to erosion. The Discharger submitted a request for an amendment of post-closure land use to the Local Enforcement Agency and portions of the parking lot area were paved while other portions were vegetated.
20. A landfill gas control system became operational at the site during January 1993, and was expanded during 1994. The landfill gas control system consists of 23 in-fill landfill gas

extraction wells, underground piping and a flare located at the County Sheriff's station next to the landfill. Landfill gas is extracted from the landfill waste and routed to the flare where it is burned using supplemental natural gas. Perimeter landfill gas probes are monitored for the presence of methane and carbon dioxide.

### **GROUNDWATER, SURFACE WATER AND UNSATURATED ZONE MONITORING**

21. The groundwater monitoring network consists of corrective action monitoring wells MW-1 through MW-6, MW-7R and MW-8, and detection monitoring wells MW-9 through MW-12, as shown on Attachment B, which is hereby incorporated and made part of this Order. Monitoring well MW-1 was formerly the background monitoring well for the landfill, but has since become impacted with elevated concentrations of salt constituents and low levels of VOCs. There is a large amount of historical data from this well prior to it becoming impacted. The historical data has been used by the Discharger to determine concentration limits for the constituents of concern at the facility that are listed in the attached Monitoring and Reporting Program (MRP) No. R5-2003-0046.
22. Surface water monitoring locations are R-1 through R-4, as shown on Attachment B.
23. Three unsaturated zone monitoring points (1U, 2US, and 2UN) are located adjacent to the landfill. Monitoring of soil-pore liquid in the unsaturated zone monitoring is required by Title 27, CCR and has been conducted at the Elk Grove Landfill for a number of years yielding very little useful data. Considering that there are known groundwater impacts at the landfill from both leachate and landfill gas, the usefulness of continued monitoring of soil-pore liquid in an already impacted unsaturated zone is not apparent. The Discharger is also monitoring numerous probes for the presence of landfill gas that provides much more useful data on conditions in the unsaturated zone, and §20415(d)(4) of Title 27, CCR allows the use of an alternate method for unsaturated zone monitoring. Therefore, this Order waives the requirement for continued monitoring of soil-pore liquid in the unsaturated zone during the period that the facility is in corrective action for groundwater impacts. The unsaturated zone monitoring points will remain in place so that unsaturated zone monitoring can resume, if determined to be necessary, after corrective action is completed.

### **EVALUATION OF GROUNDWATER IMPACTS AND PILOT TESTING**

24. Prior to 2000, the groundwater monitoring network consisted of one upgradient background monitoring well (MW-1), and three downgradient detection monitoring wells (MW-2, MW-3, and MW-4). During 1999, the Board adopted updated WDRs Order No. 99-104. Quarterly monitoring data at that time indicated that groundwater downgradient from the landfill contained elevated concentrations of salt constituents including chloride, sulfate and total dissolved solids. The monitoring also indicated sporadic detectable low levels of volatile organic compounds (VOCs) near the method detection limit. Order No.

99-104 required the Discharger to investigate these groundwater conditions by sampling wells in the vicinity of the landfill (as had been proposed by the Discharger), and to use that data to install permanent monitoring wells that would define the extent of impacted groundwater.

25. During 2000 and 2001, the Discharger installed groundwater monitoring wells MW-5 through MW-9. During this period, detections of VOCs in MW-1 through MW-4 became more consistent. During 2001, off-site sampling of two municipal supply wells (Fallbrook and School Street wells) owned by Elk Grove Water Supply (EGWS) showed low levels of tetrachloroethene (PCE) at concentrations less than 1 microgram per liter ( $\mu\text{g/L}$ ). EGWS subsequently discontinued use of the School Street well and limited the use of the Fallbrook well to peak demand and emergency use. During September 2001, Board staff approved a *Remedial Pilot Study Field Work Plan* to conduct a pilot study at MW-2 to test the effectiveness of in-well aeration on removing PCE from the groundwater, and to evaluate aquifer response to groundwater extraction. The results of this test indicated that VOCs could be treated to levels below the detection limits using in-well aeration. During this period, the Discharger also increased extraction of landfill gas from the existing system by running the flare continuously and by adjusting the flow at certain extraction points.
26. During October 2001, the Discharger submitted a *Proto-type Remediation Work Plan* (revised twice with focused changes and additional monitoring wells). Groundwater extraction wells EW-1 through EW-6 and soil vapor extraction wells SMVE-1 through SMVE-6 were installed over the next several months. A public meeting was conducted on 16 October 2001 to inform the local residents about preliminary plans for groundwater cleanup.
27. On 11 March 2002, the Discharger submitted an amended Report of Waste Discharge (RWD) that included proposed monitoring for the groundwater extraction and treatment system using in-well aeration. The amended RWD proposed that the extraction and treatment system be operated for several months on a pilot testing basis to gather data necessary to determine the number of extraction wells necessary to remediate groundwater prior to requesting a revision of WDRs for Regional Board approval of the Corrective Action Program. Revised Monitoring and Reporting Program (MRP) No. 99-104 was issued by the Executive Officer on 2 April 2002 with requirements for monitoring the groundwater in the extraction wells before and after treatment. Extraction wells EW-5 and EW-6 were brought online during April 2002 with near continuous operation since that time. Monitoring results have indicated that in-well aeration is effective in treating the groundwater prior to discharge into the vadose zone. A monitoring well (W-7) was also installed near EW-6 to monitor the vadose zone for the presence of groundwater. If groundwater is detected, the previous and current MRP require that it be sampled for the presence of VOCs.

28. Groundwater monitoring during the first half of 2002 indicated that the concentration of VOCs was highest near EW-6, and were generally not being detected at the southern end of the landfill at and near EW-1 through EW-4. The Discharger installed groundwater monitoring wells MW-10, MW-11 and MW-12; converted extraction well EW-3 to monitoring well MW-7R; and converted extraction well EW-2 to piezometer PZ-1 in an effort to define the extent of impacted groundwater near the northern end of the landfill. Groundwater extraction was not initiated at extraction wells EW-1 through EW-4 because VOCs were generally not being detected in these wells.
29. Samples of impacted groundwater, prior to treatment, at extraction wells EW-5 and EW-6 have been found to contain the following maximum concentrations of constituents subject to effluent limitations:

<u>Constituent</u>	<u>Concentration (µg/l)</u>
Chloroform	0.3
cis-1,2-Dichloroethene	0.21
Dichlorodifluoromethane	0.49
Tetrachloroethene (PCE)	10
Trichloroethene (TCE)	0.12
Toluene	0.13
Vinyl Chloride	<1.0 (not detected)

### EFFLUENT LIMITATIONS

30. The beneficial uses of groundwater outlined in the Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin, Fourth Edition (Basin Plan) are municipal, agricultural, and industrial supply.
31. Water quality objectives applicable to protecting beneficial uses include:
- a) Chemical Constituents
  - b) Toxicity
  - c) Taste and odors
32. Chapter 4 of the Basin Plan contains policies and procedures for translating narrative objectives using narrative limits developed by other organizations. The following limits implement all applicable water quality objectives for groundwater:

<u>Constituent</u>	<u>WQO<sup>1</sup> (µg/l)</u>	<u>Source of Objective</u>
Chloroform	1.1	Cal/EPA Cancer Potency Factor
cis-1,2-Dichloroethene	6	California Primary MCL <sup>2</sup>



<u>Constituent</u>	<u>WQO<sup>1</sup> (µg/l)</u>	<u>Source of Objective</u>
Dichlorodifluoromethane	1,000	California DHS <sup>3</sup> Action Level
Tetrachloroethene (PCE)	0.06	California Public Health Goal
Trichloroethene (TCE)	0.8	California Public Health Goal
Toluene	42	Taste & Odor Threshold
Vinyl Chloride	0.05	California Public Health Goal

<sup>1</sup> Water Quality Objective

<sup>2</sup> Maximum Contaminant Level

<sup>3</sup> Department of Health Services

33. This Order specifies maximum effluent concentration limits at or below the above listed Water Quality Objectives. In most cases the applicable WQO is greater than the Practical Quantitation Limit (PQL) for laboratory analysis. In those cases, the effluent limit is set at the PQL (0.5 µg/L for most VOCs). In the case of PCE and vinyl chloride, the WQO is lower than the lowest PQL that can be reliably achieved by most laboratories. In these cases, the effluent limit remains at the WQO; however, the Discharger is required to use the lowest PQL available for these constituents. The Discharger has reported that a PQL of 0.1 µg/L is available for PCE, which is the primary constituent of concern for this site.

### **CORRECTIVE ACTION PROGRAM**

34. As is stated in Finding No. 5, the Discharger submitted an amended Report of Waste Discharge (RWD) on 27 November 2002. This “second” amended RWD provides data and information regarding corrective action for impacts to groundwater at the site, and requests formal Regional Board approval to discharge treated groundwater into the vadose zone at groundwater extraction well locations. As required by Title 27, CCR, the amended RWD outlines a Corrective Action Program (CAP), the requirements of which are given by this Order.
35. The CAP proposed by the Discharger consists of continued groundwater extraction from extraction wells EW-5 and EW-6 with in-well aeration for removal of VOCs and discharge of the treated groundwater into the vadose zone. The discharge to the vadose zone at extraction well EW-5 is at adjacent recharge well RW-1. The discharge to the vadose zone at EW-6 is through the well screen at EW-6 above the groundwater table. The Discharger proposes to monitor the treated groundwater for VOCs on a twice per month frequency, and to monitor the treated groundwater for semi-volatile organic compounds (SVOCs) quarterly, as was required by revised MRP No. 99-104. This Order continues these requirements and specifies maximum concentrations for these compounds in the treated effluent. The MRP also requires vadose zone monitoring point W-7 to be monitored for the presence of water twice per month, and to be sampled for VOCs if water is present. The Discharger proposes to continue groundwater monitoring at existing monitoring

locations around the southern end of the landfill, and to perform additional corrective action in this area that could include groundwater extraction if the monitoring data indicates that it is necessary.

36. Extraction well EW-3 was completed as monitoring well MW-7R, and extraction well EW-2 was completed as piezometer PZ-1. Extraction wells EW-1 and EW-4 were constructed for potential use as extraction wells. This Order requires that EW-1 and EW-4 be monitored for VOCs only on a quarterly basis to assess if and when groundwater conditions warrant groundwater extraction from these wells.
37. The Discharger also proposes to conduct other corrective action activities to address landfill gas, and to address areas of localized groundwater impacts. Landfill gas will continue to be extracted from the in-fill landfill gas extraction wells and routed to the flare. The Discharger proposes to concentrate landfill gas extraction at the north end of the landfill, and at extraction points that are near monitoring wells MW-1 and MW-7R where localized low levels of VOCs have been detected in groundwater. In the event that focused landfill gas extraction does not affect VOCs in MW-7R, the Discharger proposes to extract groundwater from the well using mobile equipment. At MW-1, the Discharger proposes to extract groundwater into a tank, let the VOCs volatilize into the atmosphere, sample, introduce hydrogen release compound, and to inject the groundwater into MW-1. The Discharger proposes to use Regenesys, Hydrogen Release Compound (HRC®) which is a polylactate ester used for the purpose of accelerating reductive bioremediation processes that effectively degrade chlorinated hydrocarbons. The HRC would be used to reduce concentrations of chlorinated hydrocarbons that have been detected in the vicinity of MW-1. Information on the use of HRC at other sites in the Central Valley indicates that it can be effective; however, direct sampling of the HRC compound indicates low concentrations of some metals that could exceed Water Quality Objectives if mixed with small volumes of water. Since the compound will be mixed with several hundred gallons of groundwater prior to reinjection, it is not anticipated that dissolved metals concentration will exceed any water quality objectives. This Order requires the Discharger to sample the groundwater for dissolved metals and VOCs and establish that they are below all applicable water quality objectives prior to injecting it back into MW-1 (see Facility Specification No. 18).

### **FINANCIAL ASSURANCE**

38. 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. The Discharger submitted a cost estimate on 17 April 2000 that was approved by the Executive Officer on 27 April 2000 in the amount of \$219,000. As provided by Sections 22228 and 22245, the Discharger entered into a Pledge of Revenue Agreement with the Regional Board on 24 August 2000. The agreement establishes that the Discharger will use revenue generated from the County solid waste collection system to fund corrective action at the Elk Grove Landfill.

39. Section 22212 of Title 27, CCR requires the Discharger to establish an irrevocable fund to ensure post-closure maintenance at the landfill. The Discharger submitted a cost estimate on 29 November 1999 that was approved by Board staff on 14 December 1999 in the amount of \$109,332. As provided by Sections 22228 and 22245, the Discharger entered into a Pledge of Revenue Agreement with the Regional Board on 26 January 2000. The agreement establishes that the Discharger will use revenue generated from the County solid waste collection system to fund post-closure maintenance at the Elk Grove Landfill.

### CEQA AND OTHER CONSIDERATIONS

40. 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.
41. On 7 November 2001, the County of Sacramento, Board of Supervisors adopted a Notice of Exemption for the Elk Grove Landfill groundwater remediation project. The Department of Environmental Review and Assessment filed the Notice of Exemption with the County of Sacramento County Clerk. The Notice of Exemption stated that the project was found to be exempt from CEQA under General Rule, Section 15061(b)(3) because the project does not have the potential for significant effects on the environment.
42. This Order implements:
- a. The Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin, Fourth Edition;
  - 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; and
  - c. State Water Resources Control Board Resolution No. 93-62, Policy for Regulation of Discharges of Municipal Waste, adopted 17 June 1993.
43. State Water Resources Control Board (State Board) Resolution No. 68-16 (Resolution No. 68-16) requires the Regional Board, in regulating the discharge of waste, to maintain high quality waters of the state until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Board's policies (e.g., quality that exceeds water quality objectives). The Regional Board finds that the discharge, as allowed in these waste discharge requirements, is consistent with Resolution No. 68-16 since (1) the purpose of the discharge is to implement the cleanup of groundwater pollution and such remediation will benefit the people of the State; (2) this Order requires use of best practicable treatment, including adequate monitoring and contingency plans to assure protection of water quality; and (3) this Order does not allow

discharges of waste to degrade water quality. If the discharge causes or threatens to cause degradation of water quality, then the Discharger will be required to cease the discharge, implement source control, change the method of disposal, or take other action.

### **PROCEDURAL REQUIREMENTS**

44. The Board has notified the Discharger and interested agencies and persons of its intention to revise the WDRs for this facility.
45. In a public hearing, the Board heard and considered all comments pertaining to this facility and discharge.

IT IS HEREBY ORDERED that Order No. 99-104 is 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 waste at the Elk Grove Class III Landfill facility, except as specifically provided in this Order, is prohibited.
2. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses or to ground water, except as specifically provided in this Order, is prohibited.
3. Bypass or overflow of untreated or partially treated groundwater is prohibited.

#### **B. FACILITY SPECIFICATIONS:**

##### **Landfill Specifications**

1. Methane and other landfill gases shall be adequately vented, removed from the landfill units, or otherwise controlled to prevent the danger of explosion, adverse health effects, nuisance conditions, or the impairment of beneficial uses of groundwater or surface water due to migration through the vadose (unsaturated) zone.
2. Landfill leachate and condensate from the methane gas recovery system shall be discharged to an appropriate off-site waste management unit.

##### **Protection from Storm Events**

3. 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.

4. 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, as described in Finding No. 13 above.
5. Surface drainage from tributary areas and internal site drainage from surface or subsurface sources shall not contact or percolate through wastes.
6. 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.
7. The Discharger shall not cause an increase in turbidity over 10% of background in surface waters.

#### **Post-Closure Maintenance**

8. 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, the groundwater, landfill gas monitoring systems, the landfill gas extraction system, and any facilities associated with corrective action.
9. 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.
10. Prior to and during the rainy season, the Discharger shall perform any and all necessary reseeding of the final cover to maintain adequate vegetation.
11. The Discharger shall perform all post-closure maintenance activities specified in the facility's Final Closure and Post-Closure Maintenance Plan that are not specifically referred to in this Order.

#### **Corrective Action**

12. The Discharger shall perform all monitoring of the corrective action system as required by Monitoring and Reporting Program No. R5-2003-0046, which is incorporated herein and made part of this Order.

13. Whenever possible, the detection limit and the reporting limit for all constituents of concern shall at equal to or less than the lowest applicable water quality objective for that constituent.
14. Prior to injection into groundwater or the vadose zone, effluent shall not exceed the following limitations:

<u>Constituent</u>	<u>EPA Method</u> <sup>1</sup>	<u>Unit</u>	<u>Maximum Concentration</u>
Acetone	8260B	µg/L	10
2-Butanone	8260B	µg/L	10
Dichlorodifluoromethane	8260B	µg/L	1
Tetrachloroethene (PCE)	8260B	µg/L	0.06 <sup>2</sup>
Vinyl Chloride	8260B	µg/L	0.05 <sup>2</sup>
All other VOCs	8260B	µg/L	0.5
All SVOCs	8270B	µg/L	Practical Quantitation Limit

<sup>1</sup> Other EPA methods can be used if they can achieve equal or better quantitation limits.

<sup>2</sup> Must be below the lowest available practical quantitation limit that shall be no greater than 0.1 µg/L.

15. Groundwater in the vadose zone shall be monitored to ensure that the treated groundwater remains uncontaminated in the vadose zone after discharge. If monitoring of free liquid in the vadose zone indicates the presence of any non-naturally occurring constituents, the discharge of treated groundwater to the vadose zone shall cease until such time that measures are taken to assure that it remains uncontaminated.
16. The Discharger shall extract groundwater from a sufficient number of extraction wells and at sufficient flow rates to ensure capture of all groundwater containing VOCs at detectable concentrations.
17. The Discharger shall continue to extract landfill gas from the landfill. Landfill gas extraction shall be sufficient to prevent migration of contaminants to groundwater.
18. The Discharger shall ensure that groundwater injected at monitoring well MW-1, as described in Finding No. 37, does not contain detectable concentrations of any man-made constituents or any constituent at concentrations above any applicable water quality objective for the beneficial uses of groundwater. At a minimum, the Discharger shall analyze groundwater to be injected at MW-1 for VOCs and the dissolved metals listed in Footnote 2 of Table 1 of Monitoring and Reporting Program No. R5-2003-0046.

19. Corrective action shall continue until the concentrations of all constituents of concern in groundwater beyond the point of compliance, as defined in MRP No. R5-2003-0046, achieve background concentrations.
20. If the Discharger or Regional Board staff find that the proposed corrective action is not sufficient to achieve background concentrations of constituents of concern in groundwater, the Discharger shall provide additional corrective action in compliance with this Order.

#### **Unsaturated Zone Monitoring**

21. The requirement for monitoring of soil-pore liquid in the unsaturated zone is waived as described in Finding No. 23. The Discharger shall continue to maintain unsaturated zone monitoring points 1U, 2US and 2UN so that they may be monitored in the future if determined to be necessary.
22. 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 and carbon dioxide.

#### **C. FINANCIAL ASSURANCE**

1. 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.

In the event that the Regional Board determines that the County of Sacramento has failed or is failing to perform corrective action as required by law, the Regional Board may direct the County of Sacramento to pay from the pledged revenue such amounts as necessary to insure sufficient corrective action, as provided in the Pledge of Revenue Agreement described in Finding No. 38. The County of Sacramento shall be obligated to use such funds for corrective action in accordance with the directive of the Regional Board.

2. 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.

In the event that the Regional Board determines that the County of Sacramento has failed or is failing to perform post-closure maintenance as required by law, the Regional Board may direct the County of Sacramento to pay from the pledged revenue such amounts as necessary to insure sufficient post-closure maintenance, as

provided in the Pledge of Revenue Agreement described in Finding No. 39. The County of Sacramento shall be obligated to use such funds for post-closure maintenance in accordance with the directive of the Regional Board.

**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. R5-2003-0046. 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 legible records of the volume and type of each waste discharged at the Class III Landfill and the manner and location of discharge. 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. R5-2003-0046 throughout the post-closure maintenance period.
10. The owner of the Class III Landfill site 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 and 40 CFR Part 258 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 14 March 2003.

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THOMAS R. PINKOS, Executive Officer

Attachments  
WLB