CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2013-XXXX
FOR
NANCY C. CLEAVINGER, TRUSTEE OF THE NC CLEAVINGER
FAMILY TRUST, ET AL.
FLORIN PERKINS LANDFILL
UNCLASSIFIED LANDFILL UNITS
CLOSURE AND CORRECTIVE ACTION
SACRAMENTO COUNTY

This monitoring and reporting program (MRP) is issued pursuant to California Water Code section 13267 and incorporates requirements for groundwater, surface water, and unsaturated zone monitoring and reporting; facility monitoring, maintenance, and reporting contained in California Code of Regulations, title 27, section 20005, et seq. (hereafter Title 27), Waste Discharge Requirements (WDRs) Order No. R5-2013-XXXX, and the Standard Provisions and Reporting Requirements For Industrial Facilities (SPRRs) dated September 2003. Compliance with this MRP is ordered by the WDRs and the Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Central Valley Water Board or the Executive Officer.

A. MONITORING

The Discharger shall comply with the detection and corrective action monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone in accordance with the monitoring and response to release provisions (i.e., Sections IX and X) of the SPRRs and monitoring specifications (i.e., Section H) of the WDRs. All compliance monitoring wells established for the detection monitoring program shall constitute Monitoring Points under the Water Quality Protection Standard. All detection monitoring program groundwater monitoring wells, unsaturated zone monitoring devices, leachate, and surface water Monitoring Points shall be sampled and analyzed for monitoring parameters and Constituents of Concern (COCs) as indicated and listed in Tables I through VI.

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

Section	Monitoring Program
A.1	Groundwater Monitoring
A.2	Unsaturated Zone Monitoring
A.3	Leachate Seep Monitoring
A.4	Surface Water Monitoring
A.5	Facility Monitoring
A.6	Additional Corrective Action Monitoring

1. **Groundwater Monitoring**

The Discharger shall operate and maintain groundwater detection and corrective action monitoring systems that comply with the applicable provisions of Title 27, sections 20415 through 20430. These groundwater monitoring systems shall be certified by a California-licensed professional civil engineer or geologist as meeting the requirements of Title 27. The current groundwater monitoring network for the landfill units shall consist of the following wells:

a. Southern Fill Area (SFA)

<table>
<tr><th>Well</th><th>Program</th><th>Zone</th><th>Location</th></tr>
<tr><td>MW-B</td><td rowspan="2">Background</td><td rowspan="4">Upper</td><td rowspan="4">Onsite</td></tr>
<tr><td>MW-E</td></tr>
<tr><td>MW-C</td><td rowspan="2">Detection & Corrective Action</td></tr>
<tr><td>MW-F</td></tr>
<tr><td>MW-G(S)</td><td rowspan="3">Corrective Action</td><td rowspan="2">Upper</td><td rowspan="3">Onsite (Buffer Area)</td></tr>
<tr><td>MW-H(S)</td></tr>
<tr><td>MW-G(D)</td><td rowspan="2">Lower</td></tr>
<tr><td>MW-H(D)</td><td>Detection</td></tr>
<tr><td>Aspen MW-2</td><td rowspan="2">Detection & Corrective Action</td><td rowspan="2">Upper</td><td rowspan="2">Offsite (southeast)</td></tr>
<tr><td>Aspen MW-3</td></tr>
</table>

b. Northern Fill Area (NFA)

<table>
<tr><th>Well</th><th>Program</th><th>Zone</th><th>Well Location</th></tr>
<tr><td>JRLF MW-2</td><td rowspan="2">Background</td><td rowspan="3">Upper</td><td>Offsite (northwest)</td></tr>
<tr><td>JRLF MW-1</td><td>Offsite (north)</td></tr>
<tr><td>MW-D</td><td>Detection & Corrective Action</td><td rowspan="3">Onsite</td></tr>
<tr><td>MW-A</td><td rowspan="2">Groundwater Elevation Only</td><td>Upper</td></tr>
<tr><td>MW-I</td><td>Lower</td></tr>
</table>

c. Eastern Fill Area (EFA)

<table>
<tr><th>Well</th><th>Program</th><th>Zone</th><th>Well Location</th></tr>
<tr><td>JRLF MW-1</td><td>Background</td><td rowspan="3">Upper</td><td>Offsite (north)</td></tr>
<tr><td>MW-D</td><td>Background</td><td>Onsite</td></tr>
<tr><td>Aspen MW-1</td><td>Detection</td><td>Offsite (east)</td></tr>
</table>

Groundwater monitoring shall be conducted on all background, detection, and corrective action monitoring wells specified above that are either owned by the Discharger or (in the case of offsite wells) for which the Discharger has legal access for sampling. **Once per quarter**, the Discharger shall measure

the groundwater elevation in each of these wells, determine groundwater flow direction, and estimate groundwater flow rates in the uppermost aquifer and in any zones of perched water and in any additional portions of the zone of saturation monitored. The results shall be reported semiannually, including the times of expected highest and lowest elevations of the water levels in the wells, pursuant to Title 27, section 20415(e)(15).

The Discharger shall collect, preserve, and transport groundwater samples in accordance with the Sample Collection and Analysis Plan submitted under WDR Provision I.7.a (or a modified version thereof), as approved by Central Valley Water Board staff. Samples shall be collected and analyzed for the parameters and constituents listed in Table I in accordance with the specified methods and frequencies. Samples collected for the COCs specified in Table I shall be collected and analyzed in accordance with the methods listed in Table V every 2½ years beginning with the First Half 2015 monitoring period under this Order.

For all monitoring wells named under this Order not owned by the Discharger, or for which the Discharger does not have legal access for monitoring, the Discharger shall acquire the required monitoring data from, and with the permission of, the offsite well owner (or its authorized representative per the SPRR) or from the public records. If the information cannot be obtained, the Discharger shall document its attempts to obtain the information.

Detection and corrective action monitoring data analysis shall be conducted consistent with the statistical and non-statistical data analysis methods contained in the updated Water Quality Protection Standard Report submitted under WDR Provision I.7.b, as approved by Central Valley Water Board staff. The results of monitoring (including acquired data) for quarterly field parameters, semiannual monitoring parameters, and 2½-year COCs, shall be reported in the monitoring report for the semiannual period in which the samples were collected.

2. **Unsaturated Zone Detection Monitoring**

Monitoring of soil pore water beneath the landfill units is infeasible because each unit is unlined. The unsaturated zone detection monitoring program is therefore limited to landfill gas and soil gas monitoring.

a. Soil-Pore Gas

The unsaturated zone detection monitoring network shall include the 13 soil-pore gas monitoring wells (28 probes) installed along the facility perimeter as described in WDR Finding 31, as follows:

Unit	Monitoring Point	Program
Southern Fill Area	GP-1[1]	Corrective Action
	GP-2[1]	
	GP-3[1]	
	GP-8[1]	
	GP-7[1]	Detection
	GP-13[1]	
Eastern Fill Area	GP-5[2]	Detection
	GP-6[3]	
Northern Fill Area	GP-4[3]	Detection
	GP-10[3]	
	GP-11[3]	
	GP-12[3]	
Central Processing Area	GP-9[3]	Detection

1. Triple-nested (shallow, middle, and deep) completion relative to landfill waste.
2. Double-nested (shallow and deep) completion relative to landfill waste.
3. Single (deep) completion relative to landfill waste.

Soil-pore gas monitoring shall also be conducted on any new or replacement monitoring probes installed outside of or beneath the landfill units to monitor LFG migration and the effectiveness of landfill gas control measures. Soil pore gas samples shall be collected from the perimeter wells listed above, including each nested probe in each well.

b. Landfill Gas

The unsaturated zone detection monitoring network shall also include all vapor probes installed in landfill waste that showed relatively low concentrations of methane (i.e., <20%) prior to installation of landfill gas vents. The current landfill gas detection monitoring network shall consist of the following:

Unit	Monitoring Point	Program
Eastern Fill Area	VP-3	Detection
	VP-5	
	VP-6	
Northern Fill Area	VP-8	Detection

In the event a vapor probe shows methane concentrations equal to or exceeding 20% on two or more consecutive monitoring events, that vapor probe shall be moved to the Additional Corrective Action Monitoring

Program under Section A.6.b herein. LFG detection monitoring shall also be conducted on any new or replacement vapor probes satisfying the above criteria.

All soil-pore gas and LFG samples collected under this section shall be analyzed for the parameters and constituents listed in Table II.A in accordance with the specified methods and frequencies. The Discharger shall collect, preserve, and transport samples in accordance with the quality assurance/quality control standards contained in the approved Sample Collection and Analysis Plan. Monitoring results for the unsaturated zone shall be included in the monitoring reports submitted under this Order and shall include an evaluation of potential impacts of the facility on the unsaturated zone and compliance with the Water Quality Protection Standard.

3. **Leachate Seep Monitoring**

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

4. **Surface Water Monitoring**

The Discharger shall operate a surface water detection monitoring system that complies with the applicable provisions of Title 27, sections 20415 and 20420. The current surface water monitoring points for the landfill are:

Monitoring Point	Status	Location
SW-1	Detection	Quarry Pit (northwest)
SW-2	Detection	Quarry Pit (north)
SW-3	Detection	Quarry Pit (west)
SW-4	Detection	Quarry Pit (northwest)
SW-5	Background	Buffer area (south)

For surface water detection monitoring, a sample shall be collected at each monitoring point location or the closest location to that monitoring point where there is ponded water. A background storm water sample shall also be collected from a representative location in the Buffer Area south of the facility for comparison purposes. Samples shall be analyzed for the monitoring parameters and constituents in accordance with the methods and frequency specified in Table IV.

5. **Facility Monitoring**

a. **Annual Facility Inspection**

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

b. **Major Storm Events**

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

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

Prior to June 2017, and every five years thereafter, the Discharger shall conduct an iso-settlement survey for closed landfill units and produce an iso-settlement map accurately depicting the estimated total change in elevation of each portion of the final cover's engineered soil layer. For each portion of the landfill, this map shall show the total lowering of the surface elevation of the final cover, relative to the baseline topographic map [Title 27, section 21090(e)(1 & 2)]. Reporting shall be in accordance with Section B.6 of this MRP. All final cover surveys shall be conducted in accordance with WDR Closure and Postclosure Specification E.12.

d. **Standard Observations**

The Discharger shall conduct Standard Observations at the landfill in accordance with this section of the MRP. Standard observations shall be conducted monthly during the wet season (1 October to 30 April) and quarterly during the dry season (1 May to 30 September). Results of Standard Observations shall be submitted in the semiannual monitoring reports required in Section B.1 of this MRP.

6. Additional Corrective Action Monitoring

a. Landfill Gas Vents

The Discharger shall monitor vented gas from all passive landfill gas vents installed at the landfill units described in WDR Findings 48 and 61. Vent monitoring shall be conducted to assess the effectiveness of the vents in removing LFG from the landfill as a corrective action measure (both interim and long term) under Title 27 and this MRP. Gas samples shall be collected from each vent and analyzed for all parameters and constituents listed in Table II.B at their listed frequencies.

b. Landfill Vapor Probes

The unsaturated zone corrective action monitoring network shall include all vapor probes installed in landfill waste that showed methane concentrations equal to or exceeding 20% on two or more consecutive monitoring events prior to the installation of landfill gas vents. LFG corrective action monitoring shall also be conducted on any new or replacement vapor probes satisfying these criteria. The current landfill gas corrective action monitoring network shall consist of the following:

Unit	Monitoring Point	Program
SFA	VP-1	Corrective Action
SFA	VP-2	Corrective Action
SFA	VP-4	Corrective Action
NFA	VP-7	Corrective Action

Gas samples shall be collected from each of the above vapor probes and analyzed for all parameters and constituents listed in Table II.B (except air flow rate and vent pressure) at their listed frequencies.

c. Active LFG Extraction

In the event that Discharger proposes or is required to install an active LFG extraction system at the facility and that system is approved and installed under this Order, that system shall be monitored consistent with the following schedule:

LFG EXTRACTION SYSTEM MONITORING (If Applicable)			
LFG			
Parameter	Units	Sampling Frequency	Reporting Frequency

See Table II.B[1]	---	---	---
Total VOCs removed during year	lbs/yr	Annually[2]	Annually
Cumulative VOCs removed	lbs	Annually[2]	Annually

1. Monitoring shall include all Table II.B field and monitoring parameters, as applicable to active extraction system.
2. Amounts shall be calculated or estimated per approved monitoring plan.

B. REPORTING

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

Reporting Schedule			
Section	Report	End of Reporting Period	Due Date
B.1	Semiannual Monitoring Report	30 June, 31 December	**1 August, 1 February**
B.2	Annual Monitoring Report	31 December	**1 February**
B.3	Seep Reporting	Continuous	**Immediately & 7 Days**
B.4	Annual Facility Inspection Report	31 October	**15 November**
B.5	Major Storm Event Reporting	Continuous	**7 days from damage discovery**
B.6	Survey and Iso-Settlement Map for Closed Landfills	Every Five Years	**Upon closure and every 5 years thereafter**

Reporting Requirements

The Discharger shall submit monitoring reports **semiannually** with the data and information as required in this Monitoring and Reporting Program and as required in WDRs Order No. R5-2013-XXX and the SPRR, particularly the monitoring and response to release provisions (i.e., WDR Section H and SPRR Sections IX and X). In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Data shall also be submitted in a digital format, such as a computer disk.

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

The results of **all monitoring** conducted under this Order, and all required monitoring data acquired from offsite well owners, shall be reported to the Central Valley Water Board in accordance with the reporting schedule above for the calendar period in which samples were taken or observations made.

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

1. Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;
2. Date, time, and manner of sampling;
3. Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;
4. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
5. Calculation of results; and
6. Results of analyses, and the MDL and PQL for each analysis. All peaks shall be reported.

Required Reports

1. **Semiannual Monitoring Report**

   Monitoring reports shall be submitted semiannually and are due on **1 August** and **1 February**. Each semiannual monitoring report shall contain at least the following:

   a. For each groundwater monitoring point addressed by the report, a description of:

      1) The time of water level measurement;

2) The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;

3) The method of purging used to stabilize water in the well bore before the sample is taken including the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; results of pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water;

4) The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and

5) A statement that the sampling procedure was conducted in accordance with the approved Sample Collection and Analysis Plan.

b. A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.

c. The estimated quarterly groundwater flow rate and direction in the uppermost aquifer, in any zones of perched water, and in any additional zone of saturation monitored based upon water level elevations taken prior to the collection of the water quality data submitted in the report [Title 27, section 20415(e)(15)].

d. Cumulative tabulated monitoring data for all monitoring points and constituents for groundwater, unsaturated zone, leachate, and surface water. Concentrations below the laboratory reporting limit shall not be reported as “ND” unless the reporting limit is also given in the table. Otherwise they shall be reported “<” the reporting limit (e.g., <0.10). Units shall be as required in Tables I through IV unless specific justification is given to report in other units. Refer to the SPRRs Section I “Standard Monitoring Specifications” for requirements regarding MDLs and PQLs.

e. Laboratory statements of results of all analyses evaluating compliance with requirements.

f. An evaluation of the concentration of each monitoring parameter (or 5-year COC when five year COC sampling is conducted) as compared to the current concentration limits, and the results of any required verification testing for constituents exceeding a concentration limit. Report any actions taken under Section J: Response to a Release for verified exceedances of a concentration limit.

g. An evaluation of the effectiveness of run-off/run-on control facilities.

h. A summary of all Standard Observations for the reporting period required in Section A.5.d of this MRP.

i. A summary of inspection, leak search, and repair of final covers on any

closed landfill units in accordance with an approved final post-closure maintenance plan as required by Standard Closure and Post-Closure Maintenance Specifications G.26 through G.29 of the SPRRs.

j. Copies of monitoring reports or monitoring data legally acquired from offsite well owners or public records.

2. **Annual Monitoring Report**

The Discharger shall submit an Annual Monitoring Report to the Central Valley Water Board by **1 February** covering the reporting period of the previous monitoring year. If desired, the Annual Monitoring Report may be combined with the second semiannual report, but if so, shall clearly state that it is both a semi-annual and annual monitoring report in its title. Each Annual Monitoring Report shall contain the following information:

a. All monitoring parameters shall be graphed to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous five calendar years. If a 5-year COC event was performed, than these parameters shall also be graphically presented. Each such graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. Graphical analysis of monitoring data may be used to provide significant evidence of a release.

b. An evaluation of the monitoring parameters with regards to the cation/anion balance, and a graphical presentation using a Stiff diagram, a Piper graph, or a Schoeller plot.

c. All historical monitoring data for which there are detectable results, including data for the previous year, shall be submitted in tabular form in a digital file format such as a computer disk. The Central Valley Water Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [Title 27, section 20420(h)], that facilitates periodic review by the Central Valley Water Board.

d. Hydrographs of each well showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be prepared quarterly and submitted annually.

e. A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.

f. A map showing the area and elevations in which filling has been

completed during the previous calendar year and a comparison to final closure design contours, and include a projection of the year in which each discrete landfill module will be filled.

g. A written summary of the monitoring results, indicating any changes made or observed since the previous Annual Monitoring Report.

h. The results of the annual testing of leachate collection and removal systems required under Standard Facility Specification E.14 of the SPRRs.

i. Updated concentration limits for each monitoring parameter at each monitoring well based on the new data set.

j. A comprehensive discussion of any Corrective Action Program required by this MRP under Section A.6.

3. **Seep Reporting**

The Discharger shall report by telephone any seepage from the disposal area **immediately** after it is discovered. A written report shall be filed with the Central Valley Water Board **within seven days**, containing at least the following information:

a. A map showing the location(s) of seepage;

b. An estimate of the flow rate;

c. A description of the nature of the discharge (e.g., all pertinent observations and analyses);

d. Verification that samples have been submitted for analyses of the Field Parameters and Monitoring Parameters listed in Table III of this MRP, and an estimated date that the results will be submitted to the Central Valley Water Board; and

e. Corrective measures underway or proposed, and corresponding time schedule.

4. **Annual Facility Inspection Reporting**

By **15 November** of each year, the Discharger shall submit a report describing the results of the inspection and the repair measures implemented, preparations for winter, and include photographs of any problem areas and the repairs. Refer to Section A.5.a of this MRP, above.

5. **Major Storm Event Reporting**

Following major storm events capable of causing damage or significant erosion, the Discharger **immediately** shall notify Central Valley Water Board

staff of any damage or significant erosion upon discovery and report subsequent repairs within **14 days** of completion of the repairs, including photographs of the problem and the repairs. Refer to Section A.5.b of this MRP, above.

6. **Survey and Iso-Settlement Map for Closed Landfills**

The Discharger shall conduct a survey and submit an iso-settlement map for each closed area of the landfill every five years pursuant to Title 27, section 21090(e). Refer to Section A.5.c of this MRP, above. The first report is due by **30 June 2017** (i.e., after closure of the SFA) and the next report is due by **30 June 2022** (i.e., after closure of the NFA and EFA).

C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

1. **Water Quality Protection Standard Report**

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

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

a. Identify **all distinct bodies of surface and ground water** that could be affected in the event of a release from a waste management unit or portion of a unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.

b. Include a map showing the monitoring points and background monitoring points for the surface water monitoring program, groundwater monitoring program, and the unsaturated zone monitoring program. The map shall include the point of compliance in accordance with Title 27, section 20405.

c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).

d. Include a proposed statistical method for calculating concentration limits for monitoring parameters and constituents of concern that are detected in 10% or greater of the background data (naturally-occurring constituents) using a statistical procedure from Title 27, section 20415(e)(8)(A-D)] or section 20415(e)(8)(E).

e. Include a retesting procedure to confirm or deny measurably significant evidence of a release pursuant to Title 27, section 20415(e)(8)(E) and section 20420(j)(1-3).

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

The Water Quality Protection Standard used under previous WDRs is not relevant under this Order because the three area fill cells at the site are being closed and monitored as separate landfill units. The Water Quality Protection Standard under this Order shall therefore be as set forth in the updated Water Quality Protection Standard Report submitted under WDR Provision H.7.b, as approved by Central Valley Water Board staff. Once approved, the Water Quality Protection Standard shall be updated annually as warranted, using new and historical background monitoring data and approved data analysis methods.

2. **Monitoring Parameters**

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

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

The COCs include a larger group of waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the waste management unit, and are required to be monitored at least every five years [Title 27, sections 20395 and 20420(g)]. The COCs for all waste management units at the facility are those listed in Tables I through IV for the specified monitored medium, and Table V. The Discharger shall monitor all COCs every 2½ years (or more frequently if required in a Corrective Action Program). The last COC monitoring event under previous WDRs was conducted in October 2012 and reported in the *2012 Annual Monitoring Report* submitted to the Central Valley Water Board in January 2013. The first 2½-year COC monitoring event under this Order shall therefore be conducted by April 2015 and reported in the First Half 2015 monitoring report due by **1 August 2015**.

4. **Concentration Limits**

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

a. By calculation in accordance with a statistical method pursuant to Title 27, section 20415(e)(8); or

b. By an alternate statistical method meeting the requirements of Title 27, section 20415(e)(8)(E).

The data analysis methods used for calculating concentration limits under this Order shall be those set forth in the updated Water Quality Protection Standard Report submitted under WDR Provision H.7.b, as approved by Central Valley Water Board staff.

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

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

a. For analytes that are detected in less than 10% of the background samples (such as non-naturally occurring constituents), the Discharger shall use the non-statistical retesting procedure required in Monitoring Provision X.B.10 of the SPRRs.

b. For analytes that are detected in 10% or greater of the background samples (naturally occurring constituents), the Discharger shall use one of the statistical retesting procedure as required in Monitoring Provision X.B.12 of the SPRRs.

6. **Point of Compliance**

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

Unit	Point of Compliance Monitoring Wells
Southern Fill Area	C, F, and Aspen MW-2
Northern Fill Area	MW-D
Eastern Fill Area	Aspen MW-1

7. **Compliance Period**

The compliance period for each waste management unit shall be the number of years equal to the active life of the unit plus the closure period. The compliance period is the minimum period during which the Discharger shall

conduct a water quality monitoring program subsequent to a release from the waste management unit. The compliance period shall begin anew each time the Discharger initiates an evaluation monitoring program [Title 27, section 20410].

8. **Monitoring Points**

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

D. TRANSMITTAL LETTER FOR ALL REPORTS

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

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

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

_____
(Date)

JDM

TABLE I
GROUNDWATER MONITORING PROGRAM

Parameter	Units	Sampling Frequency	Reporting Frequency
Field Parameter			
Groundwater Elevation	Ft. & 100ths, M.S.L.	Quarterly	Semiannually
Temperature	^{o}F	Semiannually	Semiannually
Electrical Conductivity	µmhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
Turbidity	Turbidity units	Semiannually	Semiannually
Monitoring Parameter			
General Minerals[1]			
Bicarbonate	mg/L[1]	Semiannually	Semiannually
Calcium	mg/L	Semiannually	Semiannually
Carbonate	mg/L	Semiannually	Semiannually
Chloride	mg/L	Semiannually	Semiannually
Magnesium	mg/L	Semiannually	Semiannually
Nitrate - nitrogen	mg/L	Semiannually	Semiannually
Potassium	mg/L	Semiannually	Semiannually
Sodium	mg/L	Semiannually	Semiannually
Sulfate	mg/L	Semiannually	Semiannually
Total Dissolved Solids	mg/L	Semiannually	Semiannually
Volatile Organic Compounds[2] (USEPA Method 8260B)	µg/L[2]	Semiannually	Semiannually
Constituents of Concern (see Table V)			
Inorganics (dissolved)	µg/L	Every 2½ years[3]	Every 2½ years[3]

1. Milligrams per liter
2. Micrograms per liter
3. The first 2½-year COC monitoring event under this Order shall be conducted in the First Half 2015.

TABLE II. A			
UNSATURATED ZONE DETECTION MONITORING PROGRAM			
SOIL-PORE GAS			
Parameter	Units	Sampling Frequency	Reporting Frequency
Field Parameter			
Methane	**%**	Quarterly[1]	Semiannually
Volatile organic compounds (USEPA Method TO-15)	µg/cm3	Quarterly[2,3]	Semiannually

1. Methane monitoring shall be conducted by field meter.
2. VOC sampling required in all probes in which detected methane concentration exceeds 1% by volume.
3. VOC sampling of probe may be discontinued after one year of quarterly monitoring if detected methane concentration falls and remains below 1% by volume during that period.

TABLE II. B			
UNSATURATED ZONE CORRECTIVE ACTION MONITORING PROGRAM			
LANDFILL GAS			
Parameter	Units	Sampling Frequency	Reporting Frequency
Field Parameter[1]			
Air flow rate	cu ft/min	Quarterly	Semiannually
Vent pressure[2]	psi	Quarterly	Semiannually
Temperature	oF	Quarterly	Semiannually
Carbon dioxide	**%**	Quarterly	Semiannually
Hydrogen sulfide	ppmv	Quarterly	Semiannually
Methane	**%**	Quarterly	Semiannually
Monitoring Parameter			
Volatile organic compounds (USEPA Method TO-15)	µg/cm3	Semiannually[3]	Semiannually

1. Field monitoring shall be conducted using appropriate measuring device for each parameter,
2. Vent pressure shall be measured with the wind turbine gate valve open and closed.
3. VOC sampling required for all vents in which detected methane concentration exceeds 20% by volume during either quarterly field monitoring event.

TABLE III
LEACHATE SEEP MONITORING

Parameter	Units	Sampling Frequency	Reporting Frequency
Field Parameter			
Total Flow[1]	Gallons	Each occurrence	Within 7 days
Flow Rate[1]	Gal/Day	Each occurrence	Within 7 days
Electrical Conductivity	µmhos/cm	Each occurrence	Within 7 days
pH	pH units	Each occurrence	Within 7 days
Monitoring Parameter			
Bicarbonate	mg/L	Each occurrence	Within 7 days
Calcium	mg/L	Each occurrence	Within 7 days
Carbonate	mg/L	Each occurrence	Within 7 days
Chloride	mg/L	Each occurrence	Within 7 days
Magnesium	mg/L	Each occurrence	Within 7 days
Nitrate - nitrogen	mg/L	Each occurrence	Within 7 days
Potassium	mg/L	Each occurrence	Within 7 days
Sodium	mg/L	Each occurrence	Within 7 days
Sulfate	mg/L	Each occurrence	Within 7 days
Total Dissolved Solids	mg/L	Each occurrence	Within 7 days
Volatile organic compounds (USEPA Method 8260B)	µg/L	Each occurrence	Within 7 days

1. The quantity of leachate seepage shall be estimated and reported in gallons/day or total gallons if flow is non-continuous. Also, refer to Section B.3

TABLE IV
SURFACE WATER DETECTION MONITORING PROGRAM

Parameter	Units	Sampling Frequency[1]	Reporting Frequency[2]
Field Parameter			
Water depth	Feet	Semiannually	Semiannually
Electrical Conductivity	µmhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
Turbidity		Semiannually	Semiannually
Flow to Waters of U.S.		Semiannually	Semiannually
Monitoring Parameter			
Bicarbonate	mg/L	Semiannually	Semiannually
Calcium	mg/L	Semiannually	Semiannually
Carbonate	mg/L	Semiannually	Semiannually
Chloride	mg/L	Semiannually	Semiannually
Magnesium	mg/L	Semiannually	Semiannually
Nitrate - nitrogen	mg/L	Semiannually	Semiannually
Potassium	mg/L	Semiannually	Semiannually
Sodium	mg/L	Semiannually	Semiannually
Sulfate	mg/L	Semiannually	Semiannually
Total Dissolved Solids	mg/L	Semiannually	Semiannually
Volatile organic compounds (USEPA Method 8260B)	µg/L	Semiannually	Semiannually

1. Semiannual surface water monitoring is required twice per year when there is water present at the designated surface water monitoring point any time during the reporting period (1 January to 30 June or 1 July to 31 December).
2. Reporting shall include whether there was flow from the facility to waters of the U.S. when the samples were collected.

TABLE V

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

General Minerals	
	USEPA Method
Bicarbonate	2320B
Calcium	200.7/600
Carbonate	2320B
Chloride	300
Magnesium	200.7/600
Nitrate – Nitrogen	300
Potassium	200.7/600
Sodium	200.7/600
Sulfate	300
Total Dissolved Solids	2540C

Volatile Organic Compounds:

USEPA Method 8260B

Acetone
Acetonitrile (Methyl cyanide)
Acrolein
Acrylonitrile
Allyl chloride (3-Chloropropene)
Benzene
Bromochloromethane (Chlorobromomethane)
Bromodichloromethane (Dibromochloromethane)
Bromoform (Tribromomethane)
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Chloroprene
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans- 1,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC 12)
1,1 -Dichloroethane (Ethylidene chloride)

1,2-Dichloroethane (Ethylene dichloride)
1,1 -Dichloroethylene (1, l-Dichloroethene; Vinylidene chloride)
cis- l ,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans- l ,2-Dichloroethylene (trans- 1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
1,3-Dichloropropane (Trimethylene dichloride)
2,2-Dichloropropane (Isopropylidene chloride)
1,1 -Dichloropropene
cis- 1,3-Dichloropropene
trans- l ,3-Dichloropropene
Di-isopropylether (DIPE)
Ethanol
Ethyltertiary butyl ether
Ethylbenzene
Ethyl methacrylate
Hexachlorobutadiene
2-Hexanone (Methyl butyl ketone)
Isobutyl alcohol
Methacrylonitrile
Methyl bromide (Bromomethane)
Methyl chloride (Chloromethane)
Methyl ethyl ketone (MEK; 2-Butanone)
Methyl iodide (Iodomethane)
Methyl t-butyl ether
Methyl methacrylate
4-Methyl-2-pentanone (Methyl isobutyl ketone)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Naphthalene
Propionitrile (Ethyl cyanide)
Styrene
Tertiary amyl methyl ether
Tertiary butyl alcohol
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene; PCE)
Toluene
1,2,4-Trichlorobenzene
1,1,1 -Trichloroethane (Methylchloroform)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene; TCE)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
Vinyl acetate
Vinyl chloride (Chloroethene)
Xylene (total)

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