

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2014-XXXX
FOR
FORWARD INC. AND REPUBLIC SERVICES INC.
FORWARD LANDFILL
CLASS II
OPERATION, CLOSURE,
AND CORRECTIVE ACTION
SAN JOAQUIN 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; and financial assurances reporting contained in California Code of Regulations, Title 27, section 20005, et seq. (hereafter Title 27), Waste Discharge Requirements (WDRs) Order No. R5-201X-XXXX, and the Standard Provisions and Reporting Requirements (SPRRs) dated January 2012. Compliance with this MRP is ordered by the WDRs and the Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Central Valley Water Board or the Executive Officer.

A. MONITORING

The Discharger shall comply with the detection, evaluation, and corrective action monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone in accordance with Standard Monitoring Specifications in Section I of the SPRRs and the Monitoring Specifications in Section G of the WDRs. All monitoring shall be conducted in accordance with the approved 1994 *Sampling and Analysis Plan*, which includes quality assurance/quality control standards.

All compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard. All 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, and are identified in the approved Sample Collection and Analysis Plan.

The monitoring program of this MRP includes:

<u>Section</u>	<u>Monitoring Program</u>
A.1	Groundwater Monitoring
A.2	Unsaturated Zone Monitoring
A.3	Leachate Monitoring, Seep Monitoring, and LCRS Testing
A.4	Surface Water Monitoring
A.5	Landfill Gas Monitoring
A.6	Facility Monitoring
A.7	Compost Facility Monitoring
A.8	Cannery Waste Land Application Monitoring
A.9	Surface Impoundment Monitoring
A.10	Corrective Action Monitoring

1. Groundwater Monitoring

The Discharger shall operate and maintain a groundwater monitoring system that complies with the applicable provisions of Title 27, sections 20415 20420, 20425 and 20430. The groundwater monitoring network shall be certified by a California-licensed professional civil engineer or geologist as meeting the requirements of Title 27. The current groundwater detection monitoring system meets the applicable requirements of Title 27. The Discharger shall revise the groundwater detection monitoring system (after review and approval by Central Valley Water Board staff) as needed in response to landfill expansion, response to a release, or for corrective action.

The current groundwater monitoring network shall consist of the following wells. Note that the status of each well may change as additional evaluation or corrective action measures are implemented, and additional wells may be added to the monitoring network.

<u>Unit</u>	<u>Status</u>	<u>Wells</u>
Forward	Background	MW-22, MW-23R, MW-24
	Detection	MW-1A, -2A, -3A, -10, 13A, -14A, -15, -16, -17, -18, -19, & -21
	Domestic	DW-9690
Austin Road Shallow Zone	Background	AMW-2
	Detection and Corrective Action	AMW-5R & -12 AMW-1, -4, -10, -11, -13, -14, -18, -19, -21S, -22S, -24SR, -29S, -30-S, -31S & -32S
Austin Road Deep Zone	Detection	AMW-7 & -6

Corrective and	AMW-13B, -18B, -19BR, -21, -22, -24R, -25,
Evaluation	-26R, -28, -29, -30, -31, & -32
Domestic	7898-A, 8106-A

Groundwater samples shall be collected quarterly from all wells listed in the above table (i.,e background wells, detection monitoring wells, evaluation monitoring wells, corrective action monitoring wells, domestic wells) and any additional wells added as part of the approved groundwater monitoring network. The collected samples shall be analyzed for the parameters and constituents listed in Table I in accordance with the specified methods and frequencies.

In addition to the approved groundwater monitoring system, Cleanup and Abatement Order R5-2008-0714 (CAO) also mandates the evaluation of the extent of groundwater impacted by the release from the Austin Road unit. Additional wells may be installed or wells may be abandoned as the evaluation program progresses under the CAO or subsequent enforcement action. Any additional wells installed as part of an evaluation into the extent of impacted groundwater, or any private wells identified as being threatened by the release from the Austin Road Unit, shall be sampled quarterly for the parameters and constituents listed in Table I until they are either abandoned with concurrence of Water Board staff or they are incorporated into a regular monitoring program as part of a revised MRP.

The Discharger shall collect, preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan.

Once per quarter, the Discharger shall measure the groundwater elevation in each well, determine groundwater flow direction, and estimate groundwater flow rates (vertically and horizontally) in the uppermost aquifer and in any zones of perched water and in any additional portions of the zone of saturation monitored.

Samples collected for the COC monitoring specified in Table I shall be collected and analyzed in accordance with the methods listed in Table VIII every five years. Five-year COCs shall be monitored again in **2018**. The results shall be reported in the Annual Monitoring Report for the year in which the samples were collected.

2. Unsaturated Zone Monitoring

The Discharger shall operate and maintain an unsaturated zone detection monitoring system that complies with the applicable provisions of Title 27, sections 20415, 20420, 20425 and 20430. The current unsaturated zone detection monitoring system does not meet the applicable requirements of Title 27. The system is inadequate from general lack of maintenance. WDR Order R5-2012-0xxx includes a time schedule for a status review, general maintenance and repair/replacement of damaged or missing monitoring points.

In addition, the Discharger shall install unsaturated zone monitoring devices (after review and approval by Central Valley Water Board staff) each time the landfill constructs a new cell or module.

The current unsaturated zone monitoring network shall consist of:

<u>Unit Monitored</u>	<u>Type</u>	<u>Monitoring Points</u>
F - North	Suction	E-1, E-2, W-1, W-2
F - West	Suction	LY-Pond-N, LY-Pond-S
Background	Suction	LY-BG-1
Forward	Suction	LY-A, LY-E1A, LY-E1B, LY-E2A, LY-E2B, D93A, D93B,
Austin Road	Suction	FU-03, FU-04W, FU-04E, FU-05, FU-06
Forward	Pan	D-01S, D-01N, D-02
Austin Road	Pan	FU-03, FU-04W, FU-04E, FU-05, FU-06

Any new unsaturated zone monitoring point shall be added to the monitoring network and shall be monitored at the same frequency as existing monitoring points. Unsaturated zone samples shall be collected from the monitoring network listed above and shall be analyzed for the parameters and constituents listed in Table II in accordance with the specified methods and frequencies (however, pan lysimeters need only be sampled when liquid is present). Pan lysimeters shall be inspected for the presence of liquid **quarterly**. If liquid is detected in a previously dry pan lysimeter, the Discharger shall verbally notify Central Valley Water Board staff within **seven days** and shall immediately sample and test the liquid for Field and Monitoring Parameters listed in Table II. Samples collected for the 5-year COC analyses specified in Table II shall be collected and analyzed in accordance with the methods listed in Table VI every five years, beginning again in **2018** (does not include soil-pore gas).

The Discharger shall collect, preserve, and transport samples in accordance with the quality assurance/quality control standards contained in the approved Sampling and Analysis Plan.

Monitoring results for the unsaturated zone shall be included in monitoring reports 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 Monitoring, Seep Monitoring, and Annual LCRS Testing

Leachate Monitoring: The Discharger shall operate and maintain the leachate collection and removal system (LCRS) sumps, conduct monitoring of any detected leachate seeps, and conduct annual testing of each LCRS in accordance with Title 27 and this monitoring program.

The current LCRS leachate sump monitoring points are:

<u>Mon Pt.</u>	<u>Unit Where Sump is Located</u>
T1	WMU A
T2	WMU A
T3	WMU A
T4	WMU A
D-87	WMU D-87
D-88 A/B	WMU D-88
D-93/94	WMU D-93/94
D-01 N/S	WMU D-01
D-02	WMU D-02
FU-03	WMU FU-03
FU-04	WMU FU-04
FU-05	WMU FU-05
FU-06	WMU FU-06
FU-10	WMU FU-10
F-North	F-North
F-West	F-West

All LCRS sumps shall be inspected monthly for the presence of leachate, and total flow and flow rate shall be recorded in accordance with the frequencies listed in Table III. If leachate is detected in a previously dry sump, the Discharger shall verbally notify Central Valley Water Board staff within **seven days** and shall immediately sample and test the leachate in the sump for Field and Monitoring Parameters listed in Table III. Leachate in the LCRS sumps shall be sampled for all parameters and constituents in accordance with the frequencies listed in Table III when liquid is present. All LCRS sump samples shall be analyzed for the 5-year COCs specified in Table III every five years, beginning again in **2018**.

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.

Annual LCRS Testing: All LCRSs shall be tested annually pursuant to Title 27, section 20340(d) to demonstrate proper operation. The results of these tests shall be reported to the Central Valley Water Board in the Annual Monitoring Report and shall include comparisons with earlier tests made under comparable conditions.

4. Surface Water Monitoring

The Discharger shall operate a surface water detection monitoring system for any landfill facility where runoff from landfill areas flows or could flow to waters of the United States. The monitoring system shall comply with the applicable provisions of Title 27, sections 20415 and 20420. At the Forward Landfill, runoff from landfill areas flows to sedimentation basins that periodically discharge to the north and south forks of Littlejohns Creek. The current surface water detection monitoring system meets the applicable requirements of Title 27.

The current surface water monitoring points for the landfill are:

<u>Mon Pt.</u>	<u>Unit</u>	<u>Location</u>
FSW-2	Forward	S. Fork Littlejohns below Austin Road
FSW-1	Forward	S. Fork Littlejohns below leachate pond
ASW-1	Austin	N. Fork Littlejohns below Austin Road
ASW-2	Austin	N. Fork Littlejohns NW of gas to energy plant

For surface water detection monitoring, a sample shall be collected quarterly if water is present, at each monitoring point location and analyzed for the monitoring parameters and constituents in accordance with the methods and frequency specified in Table IV. All surface water monitoring samples shall be collected and analyzed for the 5-year COCs specified in Table IV every five years, beginning again in **2018**. 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. If water is not present during the quarterly monitoring event, the Discharger shall so state in the monitoring report.

5. Landfill Gas Monitoring

The Discharger shall operate and maintain a landfill gas monitoring system that complies with the applicable provisions of §20415, §20420 and §20430 of Title 27 in accordance with approved Detection, Evaluation and Corrective Action Monitoring Programs, where appropriate. The monitoring system shall be certified by a California-licensed professional civil engineer or geologist as meeting the requirements of Title 27.

Landfill gas monitoring points shall be field tested for the presence of methane quarterly. Gas samples shall be collected from any monitoring point containing 5 or more percent methane and analyzed for the parameters specified in Table VI. 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.

In the event of a shutdown of the landfill gas extraction system, the Discharger shall notify Board staff via e-mail, fax, or telephone within 24 hours of knowledge and shall provide weekly status updates. This requirement excludes shutdown events where the landfill gas system restarts itself or when the system is restarted manually within 24 hours. All shutdowns, regardless of the type of restart, shall be summarized in the quarterly reports.

Landfill gas monitoring reports shall be included with the quarterly reports and shall include an evaluation of potential impacts of landfill gas on the unsaturated zone beneath and adjacent to the landfill and compliance with the Water Quality Protection Standard.

Monitoring shall be conducted at all active gas monitoring probes and extraction wells. Additional landfill gas probes and wells installed subsequent to adoption of this MRP shall be added to the monitoring program specified herein.

6. 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, surface impoundments and groundwater monitoring wells; and shall assess preparedness for winter conditions (including but not limited to erosion and sedimentation control). The Discharger shall take photos of any problems areas before and after repairs. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. Annual facility inspection reporting shall be submitted as required in Section B.4 of this MRP.

b. Major Storm Events

The Discharger shall inspect all precipitation, diversion, and drainage facilities and all landfill side slopes for damage **within 7 days** following major storm events capable of causing damage or significant erosion. The Discharger shall take photos of any problems areas before and after repairs. Necessary repairs shall be completed **within 30 days** of the

inspection. Notification and reporting requirements for major storm events shall be conducted as required in Section B.5 of this MRP.

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

For closed landfill units, the Discharger shall conduct a five-year iso-settlement survey and produce an iso-settlement map accurately depicting the estimated total change in elevation of each portion of the final cover's low-hydraulic-conductivity layer. For each portion of the landfill, this map shall show the total lowering of the surface elevation of the final cover, relative to the baseline topographic map [Title 27, section 21090(e)(1 & 2)]. Reporting shall be in accordance with Section B.6 of this MRP. The next iso-settlement survey shall be conducted in 2017.

d. **Standard Observations**

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

<u>Landfill Unit Type</u>	<u>Frequency</u>	<u>Season</u>
Active	Weekly	Wet: 1 October to 30 April
Active	Monthly	Dry: 1 May to 30 September
Inactive/Closed	Monthly	Wet: 1 October to 30 April
Inactive/Closed	Quarterly	Dry: 1 May to 30 September

The Standard Observations shall include:

1) For the landfill units:

- a) Evidence of ponded water at any point on the landfill outside of any contact storm water/leachate diversions structures on the active face (show affected area on map); and
- b) Evidence of erosion and/or of day-lighted refuse.

2) Along the perimeter of the landfill units:

- a) Evidence of leachate seeps, estimated size of affected area, and flow rate (show affected area on map); and
- b) Evidence of erosion and/or of day-lighted refuse.

3) For receiving waters:

- a) Floating and suspended materials of waste origin - presence or absence, source, and size of affected area; and
- b) Discoloration and turbidity - description of color, source, and size of affected area.

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

7. Compost Facility Monitoring

The Discharger shall monitor the Compost Facility quarterly. Samples of retention basin liquid, leachate (when present) from compost stockpile areas and leachate from active compost windrows shall be collected and analyzed for the monitoring parameters listed in Table III. The volume of incoming material for composting and the volume of compost produced shall be recorded monthly and reported in the Annual Report.

8. Cannery Waste Land Application Area Monitoring

The Discharger shall collect representative soil samples from the land application areas at the beginning and end of each cannery season; and daily wet weight and weekly composite waste samples from each cannery waste source. Less frequent composite sampling may be permitted if justified and approved by Water Board staff. The soil and composite waste samples shall be analyzed for biochemical oxygen demand (BOD), total dissolved solids, and total nitrogen. In addition, the weekly total mass of nitrogen applied per acre shall be calculated and reported in the Quarterly Reports. At the end of the cannery season, the total mass of nitrogen per acre must be determined and a crop that will uptake 100% of the nitrogen must be planted, grown and harvested before the next cannery season. An annual land application monitoring summary shall be reported in the Annual Report. In addition, the following monitoring shall be conducted:

Land application areas shall be inspected prior to discharge of putrescible cannery solids and non-putrescible rinsate/wastewater, and observations from those inspections shall be summarized for inclusion in the quarterly monitoring reports. The following items shall be noted in daily pre-application inspections:

- i. Evidence of erosion;
- ii. Berm condition;
- iii. Condition of flow control structure/valve (if any);
- iv. Proper use of valves (i.e., check that all affected valves are closed or open, as required);
- v. Soil saturation;

- vi. Ponding;
- vii. Potential runoff to off-site areas;
- viii. Potential and actual discharge to surface water;
- ix. Accumulation of organic solids;
- x. Soil clogging;
- xi. Odors that have the potential to be objectionable at or beyond the property boundary; and
- xii. Vectors (Insects, rodents).

Temperature, wind direction and approximate speed, and other relevant field conditions shall be also be observed and recorded. The notations shall also document any corrective actions taken based on documented observations. A **brief summary** of observations documented and corrective actions taken during each month shall be submitted quarterly.

The Discharger shall operate and maintain a groundwater detection monitoring system for the cannery waste land application area. The Discharger shall revise the groundwater detection monitoring system (after review and approval by Central Valley Water Board staff) as needed. The existing groundwater monitoring network consists of the following:

<u>Status</u>	<u>Wells</u>
Background	AMW-1, AMW-7
Detection	AMW-13, AMW-10

These wells are already part of the approved Groundwater Monitoring System, are sampled quarterly and analyzed for the parameters and constituents listed in Table I. Total nitrogen, iron, manganese and arsenic concentrations from these wells shall be reported separately and compared with the land application area Water Quality Protection Standard in the normal Quarterly Monitoring Reports.

9. Surface Impoundment Monitoring

The surface impoundments F-North and F-West, shall be monitored monthly for the parameters in Table V and the results shall be reported quarterly. Surface impoundment sumps shall be inspected monthly for the presence of liquid. If liquid is detected, a sample shall be analyzed for the parameters in Table III and reported quarterly.

10. Corrective Action Monitoring

The Discharger shall conduct corrective action monitoring to demonstrate the effectiveness of corrective action in accordance with Title 27, section 20430, all approved corrective action monitoring programs and this MRP. Groundwater monitoring wells and unsaturated zone monitoring points that are in a corrective

action monitoring program shall be monitored in accordance with the groundwater and unsaturated zone monitoring requirements in parts A.1 and A.2 of this MRP. The corrective action monitoring wells shall be monitored for the same parameters at the same frequency as the detection monitoring wells.

The current groundwater extraction well network is listed below. Additional extraction wells may be installed, and if so, they shall be monitored in the same manner as the wells listed below.

<u>Extraction Well</u>	<u>Zone</u>	<u>Modules Being Addressed</u>
EW-1	Shallow	Austin Road Unit
EW-2	Shallow	Austin Road Unit
EW-3	Shallow	Austin Road Unit
EW-3R	Shallow	Austin Road Unit
EW-4	Shallow	Austin Road Unit

The Discharger shall monitor the performance of corrective actions and shall include in each quarterly report the following:

- a. record the total hours of operation of all remediation systems/per day (estimated for holidays and weekends);
- b. the exact time of any system failure and restart;
- c. a description of any repairs;
- d. an evaluation of the performance of the extraction points (both landfill gas and groundwater);
- e. the volume of water discharged from the system;
- f. the mass of contaminants removed by the gas extraction system and the groundwater extraction system; and
- g. the location of discharge of the treated water.

A copy of any notifications shall be included in the facility operating record. A summary of the corrective action performance data shall be a part of the quarterly report.

B. REPORTING

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

Reporting Schedule

<u>Section</u>	<u>Report</u>	<u>End of Reporting Period</u>	<u>Due Date</u>
B.1	Quarterly Monitoring Report	31 March, 30 June, 30 September, 31 December	1 May, 1 August, 1 November, 1 February
B.2	Annual Monitoring Report	31 December	1 February

<u>Section</u>	<u>Report</u>	<u>End of Reporting Period</u>	<u>Due Date</u>
B.3	Seep Reporting	Continuous	Immediately & 7 Days
B.4	Annual Facility Inspection Report	31 October	15 November
B.5	Annual Corrective Action Evaluation Report	30 June	1 August
B.6	Major Storm Event Reporting	Continuous	7 days from damage discovery
B.7	Survey and Iso-Settlement Map for Closed Landfills	Every Five Years	At Closure Completion and Every Five Years
B.8	Financial Assurances Report	31 December	1 June

Reporting Requirements

The Discharger shall submit monitoring reports **quarterly** with the data and information as required in this Monitoring and Reporting Program and as required in WDRs Order No. R5-201X-XXX and the Standard Provisions and Reporting Requirements (particularly Section I: "Standard Monitoring Specifications" and Section J: "Response to a Release"). In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Data shall also be submitted in a digital format, such as a computer disk.

Field and laboratory tests shall be reported in each monitoring report. Quarterly 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 monitoring reports and technical reports into the online Geotracker database as required by Division 3 of Title 27.

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

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

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

Required Reports

- 1) **Quarterly Monitoring Report:** Monitoring reports shall be submitted quarterly and are due on **1 May, 1 August, 1 November** and **1 February**. Each quarterly 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 detection limit is also given in the table. Otherwise they shall be reported "<" the reporting limit (e.g., <0.10) or by an equivalent presentation of the non-detect data. Units shall be as required in Tables I through IV unless specific justification is given to report in other units. Refer to the SPRRs Section I "Standard Monitoring Specifications" for requirements regarding MDLs and PQLs.
 - e) Laboratory statements of results of all analyses evaluating compliance with requirements.
 - f) An evaluation of the concentration of each monitoring parameter (or 5-year COC when five year COC sampling is conducted) as compared to the current concentration limits, and the results of any required verification testing for constituents exceeding a concentration limit. Report any actions taken under Section J: Response to a Release for verified exceedances of a concentration limit.
 - g) An evaluation of the effectiveness of the leachate monitoring and control facilities, and of the run-off/run-on control facilities. Include a summary of any instances where leachate depth on an MSW landfill liner system exceeded 30 cm (excluding the leachate sump), and information about the required notification and corrective action in Standard Facility Specification E.13 of the SPRRs.
 - 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) Results from the compost facility monitoring.
 - k) Results from the cannery waste land application area monitoring.
 - l) Results from the surface impoundment monitoring.
 - m) Results of the corrective action monitoring.
- 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 fourth quarter report, but if so, shall clearly state that it is both a quarterly and

annual monitoring report in its title. Each Annual Monitoring Report shall contain the following information:

- a) All monitoring parameters, if detected, 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, the detected parameters shall be graphically presented if they were also detected during any previous COC event. 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) **Annual Corrective Action Evaluation Report:** By 31 July each year, the Discharger shall submit an Annual Corrective Action Evaluation Report that includes at least the following:
 - a. A comparison of the site-wide Total VOC (TVOC) mass from the past four quarters to the TVOC mass threshold limit;
 - b. a screening of the site-wide TVOC mass from the previous four quarters;
 - c. a comparison of the individual well TVOC concentrations from the previous four quarters to their respective threshold limits;
 - d. a comparison of the groundwater monitoring results from over time for each COC, for each well;
 - e. quarterly groundwater potentiometric surface maps from the previous year, incorporating data from the DMP, CAP and EMP monitoring wells;
 - f. a discussion of the landfill cover, including any performance issues from the previous year;

- 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 Discharger proposed the methods for calculating concentration limits in the 2011 *Concentration Limit Update Report*. Groundwater limits are calculated using intra-well tolerance limits and surface water limits are based on inter-station tolerance limits. All tolerance limits are based on a Type I error rate of alpha – 0.01 and a coverage of 95%.

The Water Quality Protection Standard shall be updated every two years beginning in 2014 for each monitoring well using new and historical monitoring data.

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 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 VI. The Discharger shall monitor all COCs every five years, or more frequently as required in accordance with a Corrective Action Program. The last 5-year COC report was submitted to the Central Valley Water Board in the 2008, *Third Quarter Monitoring Report* and 5-year COCs are due to be monitored again in the 2013 *First Quarter Monitoring Report*.

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 methods for calculating concentration limits were included in the 2011 *Concentration Limit Update Report*. The approved method for groundwater wells uses intra-well tolerance limits and the method for surface water samples uses inter-station tolerance limits. All tolerance limits are calculated at 95% confidence and a Type I error rate of $\alpha = 0.01$ is proposed for surface water samples.

The most recent concentration limits for select parameters as reported in the 2011 *Concentration Limit Update Report* were as follows:

GROUNDWATER CONCENTRATION LIMITS

Well	pH	TDS (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Bicarb. (mg/L)	Calcium (mg/L)	Chloride (mg/L)	VOCs (ppb)
Wells North of Austin Road Unit Shallow Zone Detection and Corrective Action Wells Concentration Limits								
AMW-2	6.43 – 8.17	1160	0.006	0.29	544	154	454	ND
AMW-12	6.27-8.73	929.9	0.007	0.32	428	115	72	ND
Wells North of Austin Road Unit Deep Zone Detection and Corrective Action Wells Concentration Limits								
AMW-5R	6.33 – 8.42	993	0.014	0.38	611	162	130	ND
AMW-7	6.12-9.61	435	0.006	0.236	271	54	48	ND
Old Forward Wells								
MW-1	6.18-8.168	1320	0.007	0.2503	876	200.4	281.4	ND
MW-2	6.29-7.84	1222	0.0055	0.5427	820	160	110	ND
MW-3	6.421-8.369	1056	0.0041	0.2728	671.9	136.8	159.1	ND
MW-10	6.347-8.45	500.3	0.0072	0.23	330	67.3	46.45	ND
MW-13	5.776-7.688	1168	0.0058	0.7098	1100	203.1	73.03	ND
MW-14	5.851-7.619	1356	0.008	0.3139	1264	219.2	168.4	ND
MW-15	6.508-8.503	849.5	0.0056	0.3233	591.3	118.3	173.4	ND
MW-16	5.963-7.689	1108	0.0057	0.7062	1040	179	52.54	ND
MW-17	6.141-8.887	876.2	0.0084	1.001	480	190	159.2	ND
MW-18	6.333-8.542	741	0.0068	0.2277	397	109.1	135.8	ND
MW-19	6.137-8.605	658.7	0.0066	0.234	360	200	220	ND
MW-21	6.235-7.997	850	0.0059	0.477	1073	172.9	75.7	ND
MW-22	4.082-8.167	803.6	0.006	0.274	380	101.5	42.37	ND
MW-23R	6.5-7.52	1156	0.0062	0.093	604.4	153.7	160	ND
MW-24	5.479-9.161	1000	0.0057	0.2348	370	148.6	82.1	ND

GROUNDWATER CONCENTRATION LIMITS (continued)

Well	Chromium, Hexavalent, (mg/L)	Magnesium (mg/L)	Nitrate (mg/L)	Potassium, (mg/L)	Sodium, (mg/L)	Strontium, (mg/L)	Sulfate (mg/L)
Wells North of Austin Road Unit Shallow Zone Detection and Corrective Action Wells Concentration Limits							
AMW-2	0.0057	67.22	57.29	11.1	89.25	1.449	146.6
AMW-12	0.0134	53.24	21.54	5.04	54.11	1.159	93.2
Wells North of Austin Road Unit Deep Zone Detection and Corrective Action Wells Concentration Limits							
AMW-5R	0.007	62	31	9.879	112.3	1.788	95.2
AMW-7	0.008	26.49	6.81	10	30.87	0.733	38.5
Old Forward Wells							
MW-1	0.0117	88.5	15.91	9.912	121.6	1.793	191.9
MW-2	0.009	108.8	9.164	8.818	84.66	2.663	65.11
MW-3	0.0095	70.54	14.47	9.52	100	1.602	78.04
MW-10	0.0057	33.74	5.751	7.012	39.76	0.7393	
MW-13	0.007842	105.1	21.25	9.514	39.76	2.508	58.5

MW-14	0.0063	106.4	3.156	10.69	107.2	2.359	66.12
MW-15	0.006295	60.69	9.047	9.478	75.56	1.361	56
MW-16	0.00848	90.43	35.32	9.527	72.82	2.037	54.86
MW-17	0.007857	53.8	20.09	9.524	56.99	1.7	115.1
MW-18	0.00814	49.75	10.47	8.452	45.18	1.2	79.56
MW-19	0.00539	45.05	9.218	7.689	50.71	1.07	101.2
MW-21	0.005	86.37	0.6285	8.962	65.02	1.915	38.18
MW-22	0.0057	50.22	19.66	6.743	53.38	1.113	143
MW-23R	0.0082	64.2	33.98	5.295	99	1.603	137.7
MW-24	0.007	64.01	61.26	7.58	70	1.539	201.6

SURFACE WATER CONCENTRATION LIMITS

Location	pH	TDS (mg/L)	Bicarb. (mg/L)	Calcium (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Magnesium (mg/L)
Austin Unit	5.618-9.937	251.7	105	22.92	11	25.71	18.87
Forward Unit	3.842-12.06	1160	416.9	60	33	69.87	30

SURFACE WATER CONCENTRATION LIMITS (continued)

Location	Nitrate (mg/L)	TPH, Oil and Grease (ug/L)	Potassium Dissolved (mg/L)	Sodium, Dissolved (mg/L)	Sulfate (mg/L)	VOCs (ppb)
Austin Unit	2.45	5.6	3.803	20.31	22	ND
Forward Unit	18	5	8.197	60.6	86.39	ND

5. Retesting Procedures for Confirming Evidence of a Release

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

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

6. Point of Compliance

The point of compliance for the water standard at each waste management unit is a vertical surface located at the hydraulically downgradient limit of the Unit

that extends through the uppermost aquifer underlying the unit. The following are monitoring locations at the point of compliance:

<u>Cell or Module</u>	<u>Point of Compliance Monitoring Wells</u>
Old Forward Units	MW-1, -2, -3, -10, -13, -14, -15, -16, -17, -18, -19, -21.
Austin Road Unit	AMW- 1, -4, -6, -7

7. Compliance Period

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

8. Monitoring Points

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

D. TRANSMITTAL LETTER FOR ALL REPORTS

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

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

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

(Date)

TABLE I
GROUNDWATER MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Field Parameters			
Groundwater Elevation	Ft. & 100ths, M.S.L.	Quarterly	Quarterly
Temperature	°F	Quarterly	Quarterly
Electrical Conductivity	umhos/cm	Quarterly	Quarterly
pH	pH units	Quarterly	Quarterly
Turbidity	Turbidity units	Quarterly	Quarterly
Monitoring Parameters			
Total Dissolved Solids (TDS)	mg/L ¹	Quarterly	Quarterly
Chloride	mg/L	Quarterly	Quarterly
Carbonate	mg/L	Quarterly	Quarterly
Bicarbonate	mg/L	Quarterly	Quarterly
Nitrate - Nitrogen	mg/L	Quarterly	Quarterly
Sulfate	mg/L	Quarterly	Quarterly
Calcium	mg/L	Quarterly	Quarterly
Magnesium	mg/L	Quarterly	Quarterly
Potassium	mg/L	Quarterly	Quarterly
Sodium	mg/L	Quarterly	Quarterly
Strontium	mg/L	Quarterly	Quarterly
Volatile Organic Compounds (USEPA Method 8260B, short list, see Table V)	ug/L ²	Quarterly	Quarterly
5-Year Constituents of Concern (see Table VIII)			
Chemical Oxygen Demand	mg/L	5-years	First Quarter 2013
Total Organic Carbon	mg/L	5 years	and alternating
Inorganics (dissolved)	ug/L	5 years	between 1 st and
Volatile Organic Compounds (USEPA Method 8260B, extended list)	ug/L	5 years	3 rd quarters
Semi-Volatile Organic Compounds (USEPA Method 8270D)	ug/L	5 years	every 5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	ug/L	5 years	thereafter
Organophosphorus Compounds (USEPA Method 8141B)	ug/L	5 years	“ ”

¹ Milligrams per liter

² Micrograms per liter

TABLE II
UNSATURATED ZONE DETECTION MONITORING PROGRAM

PAN LYSIMETERS² (or other vadose zone monitoring device)

<u>Parameter</u>	<u>Units</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Field Parameters			
Electrical Conductivity	umhos/cm	Quarterly	Quarterly
pH	pH units	Quarterly	Quarterly
Volume of liquid removed	gallons	Monthly	Quarterly
Monitoring Parameters			
Total Dissolved Solids (TDS)	mg/L	Quarterly	Quarterly
Chloride	mg/L	Quarterly	Quarterly
Carbonate	mg/L	Quarterly	Quarterly
Bicarbonate	mg/L	Quarterly	Quarterly
Nitrate - Nitrogen	mg/L	Quarterly	Quarterly
Sulfate	mg/L	Quarterly	Quarterly
Calcium	mg/L	Quarterly	Quarterly
Magnesium	mg/L	Quarterly	Quarterly
Potassium	mg/L	Quarterly	Quarterly
Sodium	mg/L	Quarterly	Quarterly
Volatile Organic Compounds (USEPA Method 8260B, short list, see Table V)	ug/L	Quarterly	Quarterly
5-Year Constituents of Concern (see Table VIII)			
Total Organic Carbon	mg/L	5 years	First quarter 2013 and alternating between 1 st and 3 rd quarters every 5 years thereafter
Inorganics (dissolved)	ug/L	5 years	
Volatile Organic Compounds (USEPA Method 8260B, extended list)	ug/L	5 years	
Semi-Volatile Organic Compounds (USEPA Method 8270D)	ug/L	5 years	“ “
Chlorophenoxy Herbicides (USEPA Method 8151A)	ug/L	5 years	“ “
Organophosphorus Compounds (USEPA Method 8141B)	ug/L	5 years	“ “

¹ Soil-pore gas samples collected from landfill gas probes are only subject to the VOC (USEPA Method TO-14) and methane sampling (not the other parameters listed for pan lysimeters).

² Pan lysimeters shall be inspected for the presence of liquid **quarterly**. If liquid is detected in a previously dry pan lysimeter, the Discharger shall verbally notify Central Valley Water Board staff within **seven days** and shall immediately sample and test the liquid for Field and Monitoring Parameters listed in Table II.

TABLE III
LEACHATE MONITORING ¹, SEEP MONITORING ², AND LCRS TESTING ³

<u>Parameter</u>	<u>Units</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Field Parameters			
Total Flow	Gallons	Monthly	Quarterly
Flow Rate	Gallons/Day	Monthly	Quarterly
Electrical Conductivity	umhos/cm	Quarterly	Quarterly
pH	pH units	Quarterly	Quarterly
Monitoring Parameters			
Total Dissolved Solids (TDS)	mg/L	Annually	Annually
Chloride	mg/L	Annually	Annually
Carbonate	mg/L	Annually	Annually
Bicarbonate	mg/L	Annually	Annually
Nitrate - Nitrogen	mg/L	Annually	Annually
Sulfate	mg/L	Annually	Annually
Calcium	mg/L	Annually	Annually
Magnesium	mg/L	Annually	Annually
Potassium	mg/L	Annually	Annually
Sodium	mg/L	Annually	Annually
Volatile Organic Compounds (USEPA Method 8260B, short list, see Table V)	ug/L	Annually	Annually
5-Year Constituents of Concern (see Table VIII)			
Total Organic Carbon	mg/L	5 years	First Quarter 2013
Inorganics (dissolved)	ug/L	5 years	and alternating
Volatile Organic Compounds (USEPA Method 8260B, extended list)	ug/L	5 years	between 1 st and 3 rd
Semi-Volatile Organic Compounds	ug/L	5 years	quarters every 5
			years thereafter
(USEPA Method 8270D)			
Chlorophenoxy Herbicides (USEPA Method 8151A)	ug/L	5 years	" "
Organophosphorus Compounds (USEPA Method 8141B)	ug/L	5 years	" "
LCRS Testing ³	---	Annually	Annually

¹ If leachate is detected in a previously dry sump, the Discharger shall verbally notify Central Valley Water Board staff within **seven days** and shall immediately sample and test the leachate for Field and Monitoring Parameters listed in Table III. Leachate in the LCRS sump shall then be sampled for all parameters and a constituent in accordance with the frequencies listed in Table III whenever liquid is present. Leachate from compost stockpiles, active windrows and retention basin shall be sampled quarterly when present for the Field and Monitoring Parameters listed in Table III.

² Leachate seeps shall be sampled and analyzed for the Field and Monitoring Parameters in this table upon detection. The quantity of leachate shall be estimated and reported in gallons/day. Also, refer to Section B.3)

³ The Discharger shall test each LCRS for each waste management unit annually pursuant to Title 27, section 20340(d) to demonstrate proper operation. The results of the tests shall be compared with earlier tests made under comparable conditions.

TABLE IV
SURFACE WATER DETECTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Sampling Frequency</u> ¹	<u>Reporting Frequency</u>
Field Parameters			
Electrical Conductivity	umhos/cm	Quarterly	Quarterly
pH	pH units	Quarterly	Quarterly
Turbidity	Turbidity units	Quarterly	Quarterly
Temperature	°F	Quarterly	Quarterly
Flow to Waters of U.S.	Yes or No	Quarterly	Quarterly
Monitoring Parameters			
Total Suspended Solids (TSS)	mg/L	Quarterly	Quarterly
Total Dissolved Solids (TDS)	mg/L	Quarterly	Quarterly
Carbonate	mg/L	Quarterly	Quarterly
Bicarbonate	mg/L	Quarterly	Quarterly
Chloride	mg/L	Quarterly	Quarterly
Nitrate - Nitrogen	mg/L	Quarterly	Quarterly
Sulfate	mg/L	Quarterly	Quarterly
Calcium	mg/L	Quarterly	Quarterly
Magnesium	mg/L	Quarterly	Quarterly
Potassium	mg/L	Quarterly	Quarterly
Sodium	mg/L	Quarterly	Quarterly
TPH – Oil and Grease	mg/L	Quarterly	Quarterly
Volatile Organic Compounds (USEPA Method 8260B, short list, see Table V)	ug/L	Quarterly	Quarterly
5-Year Constituents of Concern (see Table VIII)			
Total Organic Carbon	mg/L	5 years	First Quarter 2013
Inorganics (dissolved)	ug/L	5 years	and alternating
Volatile Organic Compounds (USEPA Method 8260B, extended list)	ug/L	5 years	between 1 st and 3 rd
Semi-Volatile Organic Compounds	ug/L	5 years	quarters, every 5
			years thereafter
(USEPA Method 8270D)			
Chlorophenoxy Herbicides (USEPA Method 8151A)	ug/L	5 years	“ ”
Organophosphorus Compounds (USEPA Method 8141B)	ug/L	5 years	“ ”

¹ Quarterly surface water monitoring is required when there is water present at the designated surface water monitoring point any time during the Quarter. Reporting shall include whether there was flow from the facility to waters of the U.S. when the samples were collected.

TABLE V
SURFACE IMPOUNDMENT MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Sampling Frequency</u> ¹	<u>Reporting Frequency</u>
Field Parameters			
Freeboard	0.1 foot	weekly	Quarterly
Leachate Volume	gallons	weekly	Quarterly
LCRS Testing	----	Annually	Annually

**TABLE VI
 LANDFILL GAS (LFG) MONITORING PROGRAM**

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
LFG Plant Field Parameters		
Atmospheric Temperature	°F	Monthly
Atmospheric Pressure	PSIG	Monthly
Temperature into LFG Plant	°F	Monthly
Pressure into the LFG plant	mm of Hg vacuum	Monthly
Totalized flow and flow rate into the LFG Plant	Cubic feet & CFM	Monthly
Total halogenated VOCs into the LFG Plant	µg/cm ³	Monthly ¹
LFG Plant Influent Monitoring Parameters		
Volatile Organic Compounds (USEPA Method TO-15) ¹	µg/cm ³	Semiannually
Methane	%	Semiannually
Field and Monitoring Parameters for all LFG Extraction Wells and Monitoring Probes		
Weather Conditions		Monthly
Atmospheric Temperature	°F	Monthly
Atmospheric Pressure	mm of Hg	Monthly
Gas Temperature at each well		Monthly
Before adjustment	°F	Monthly
After adjustment	°F	Monthly
Gas Pressure at each well		
Initial static pressure in wellhead	inches H ₂ O	Monthly
Adjusted static pressure in wellhead	inches H ₂ O	Monthly
Gas concentrations at each well		
Methane	% by volume	Monthly
Carbon Dioxide	% by volume	Monthly
Oxygen	% by volume	Monthly
Remainder gas	% by volume	Monthly
Monitoring Parameters for LFG Extraction Wells		
Volatile Organic Compounds (USEPA Method TO-15) ¹	µg/cm ³	Semiannually

¹ The Discharger shall measure total halogenated VOCs using field instrument with appropriate lamp.

TABLE VII

MONITORING PARAMETERS FOR DETECTION MONITORING

Surrogates for Metallic Constituents:

pH
Total Dissolved Solids
Electrical Conductivity
Chloride
Sulfate
Nitrate nitrogen

Volatile Organic Compounds, short list:

USEPA Method 8260B

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

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

TABLE VIII
5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

<u>Inorganics (dissolved):</u>	<u>USEPA Method</u>
Aluminum	6010
Antimony	7041
Barium	6010
Beryllium	6010
Cadmium	7131A
Chromium, Hexavalent	7196
Chromium	6010
Cobalt	6010
Copper	6010
Silver	6010
Tin	6010
Vanadium	6010
Zinc	6010
Iron	6010
Manganese	6010
Arsenic	7062
Lead	7421
Mercury	7470A
Nickel	7521
Selenium	7742
Thallium	7841
Cyanide	9010C
Sulfide	9030B

Volatile Organic Compounds, extended list:

USEPA Method 8260B

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

TABLE VIII

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

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

TABLE VIII

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

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)

Semi-Volatile Organic Compounds:

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

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

TABLE VIII

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

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

TABLE VIII

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

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

TABLE VIII

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

Chlorophenoxy Herbicides:

USEPA Method 8151A

2,4-D (2,4-Dichlorophenoxyacetic acid)
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)

Organophosphorus Compounds:

USEPA Method 8141B

Atrazine
Chlorpyrifos
0,0-Diethyl 0-2-pyrazinyl phosphorothioate (Thionazin)
Diazinon
Dimethoate
Disulfoton
Methyl parathion (Parathion methyl)
Parathion
Phorate
Simazine