

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2012-XXXX
FOR
L AND D LANDFILL LIMITED PARTNERSHIP
FRUITRIDGE ROAD LAND COMPANY
L AND D LANDFILL
LIMITED CLASS III LANDFILL
OPERATION, CLOSURE, POST-CLOSURE MAINTENANCE,
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; 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. R5-2012-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 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 10 January 2003 *Site Specific Sampling and Analysis Plan* and the 11 February 2003 *Addendum to the Sampling and Analysis Plan* (hereafter "Sample Collection and Analysis Plan") or any revised sample collection and analysis plan approved by Central Valley Water Board staff, which includes quality assurance/quality control standards.

All compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard. All detection monitoring program groundwater monitoring wells, 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	Facility Monitoring
A.6	Solid Waste Monitoring
A.7	Corrective Action Monitoring

1. Groundwater Monitoring

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

The current groundwater monitoring network shall consist of the following:

Upper Water-Bearing Zone Network:

<u>Well</u>	<u>Status</u>	<u>Units Being Monitored</u>
MW-12	Background	LF-1 and LF-2
MW-13	Background	LF-1 and LF-2
MW-29	Background	LF-1 and LF-2
MW-30R	Corrective Action	LF-2
MW-31R	Detection	LF-2
MW-2A	Corrective Action	LF-1
MW-4	Corrective Action	LF-1
MW-5	Corrective Action	LF-1
MW-15	Detection	LF-1
MW-16	Corrective Action	LF-1
MW-18	Corrective Action (E) ¹	LF-1
MW-19	Corrective Action (E)	LF-1
MW-20	Corrective Action (E)	LF-1
MW-21	Corrective Action (E)	LF-1
MW-22	Corrective Action (E)	LF-1
MW-23	Corrective Action (E)	LF-1
MW-24	Corrective Action (E)	LF-1
MW-32	Corrective Action	LF-1

¹ (E) = Groundwater Extraction Well (monitoring and extraction)

Lower Water-Bearing Zone Network:

<u>Well</u>	<u>Status</u>	<u>Units Being Monitored</u>
MW-14	Background	LF-1 and LF-2
MW-8	Detection	LF-1
MW-9	Detection	LF-1
MW-11	Corrective Action	LF-1
MW-17	Detection	LF-1

Any monitoring wells installed after the adoption of this Order shall become part of the monitoring network and are subject to the requirements of this Order.

Groundwater samples shall be collected from the background wells, detection monitoring wells, corrective action monitoring wells, and any additional wells added as part of the approved groundwater monitoring system. The collected samples shall be analyzed for the parameters and constituents listed in Table I in accordance with the specified methods and frequencies. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan.

Samples collected for the COC monitoring specified in Table I shall be collected and analyzed in accordance with the methods listed in Table VI every five years. Five-year COCs were last monitored in 2007 and shall be monitored again in **2012**. The results shall be reported in the Annual Monitoring Report for the year in which the samples were collected.

Once per quarter, the Discharger shall measure the groundwater elevation in each well, determine groundwater flow direction, and estimate groundwater flow rates in the uppermost aquifer and in any zones of perched water and in any additional portions of the zone of saturation monitored. The results shall be reported semiannually, including the times of expected highest and lowest elevations of the water levels in the wells, pursuant to Title 27, section 20415(e)(15). Additional monitoring wells MW-3, 6, 7, 10, 25, 26, and 28 at the facility are not currently required to be sampled, but shall be included in the quarterly groundwater elevation measurements.

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 and 20420. The current unsaturated zone detection monitoring system meets the applicable requirements of Title 27.

The current unsaturated zone monitoring network shall consist of:

<u>Mon Pt.</u>	<u>Status</u>	<u>Units Being Monitored</u>
LYS-1	Detection	LF-2, Modules 1 through 7

Unsaturated zone samples shall be collected from pan lysimeter LYS-1 and shall be analyzed for the parameters and constituents listed in Table II in accordance with the specified methods and frequencies (the pan lysimeter need only be sampled when liquid is present). The LYS-1 pan lysimeters shall be inspected for the presence of liquid **monthly**. 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 **2012**.

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 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 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>
LCRS	LF-2, Module 2 (Sump for Modules 1 through 7)

The LCRS sump shall be inspected monthly for the presence of leachate, and flow shall be recorded in accordance with 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 for Field and Monitoring Parameters listed in Table III. Leachate in the LCRS sump shall then be sampled for all parameters and constituents in accordance with the frequencies listed in Table III whenever 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 **2012**.

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: The LCRS 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 the landfill to monitor the water in the infiltration pond (to where all facility surface water flows) for contaminants that could percolate to groundwater. The surface water monitoring program is not required to meet the applicable requirements of Title 27 since there is no discharge to surface waters of the United States and such discharge is prohibited by this Order.

The surface water monitoring point for the landfill is:

<u>Mon Pt.</u>	<u>Status</u>
Infiltration Pond	Detection Monitoring to Protect Underlying Groundwater

The Discharger shall measure the freeboard level in the infiltration pond at least monthly. For surface water detection monitoring, a sample shall be collected from a representative location within the infiltration pond 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 **2012**.

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 After Closure**

After closure of the entire landfill facility (last phase of closure is completed), the Discharger shall conduct an initial survey and then conduct iso-settlement surveys every five years thereafter. Five-year surveys shall be used to 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 five years after the final phase of closure is completed (closure is currently predicted to be completed in 2023 which would make the first iso-settlement survey in 2028).

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 semiannual monitoring reports required in Section B.1 of this MRP.

6. Solid Waste Monitoring

The Discharger shall conduct solid waste monitoring as follows:

<u>Parameter</u>	<u>Units</u>	<u>Reporting Frequency</u>
Solid Waste		
Source(s) of material discharged	---	Semi-annually
Results of Load Checking Program ¹	---	Semi-annually
Quantity discharged	cubic yards or tons	Semi-annually
Type of material discharged ²	---	Semi-annually
Minimum discharge elevation	MSL feet	Semi-annually
Capacity of landfill/module remaining	Percent	Annually
Alternate Daily Cover (ADC)		
Quantity discharged	cubic yards or tons	Semi-annually
Type of material discharged	---	Semi-annually

1. The WDRs require that the discharger maintain an updated load checking program.
2. The description should include waste classification (i.e. nonhazardous or inert).

7. Corrective Action Monitoring

The Discharger shall conduct corrective action monitoring to demonstrate the effectiveness of the Corrective Action Program in accordance with Title 27, section 20430 and this MRP. The Discharger shall operate and maintain the

groundwater extraction and treatment system to remove volatile organic compounds (VOCs) from the groundwater and prevent migration of the plume. Groundwater monitoring wells that are in a corrective action monitoring program shall be monitored in accordance with the groundwater monitoring requirements in Section A.1 of this MRP, except as modified in this section of the MRP. Each corrective action monitoring point (well) listed below shall be monitored **quarterly** for a period of two years beginning in **2013** through **2015** for the parameters listed in Table I of this MRP that have “semiannual” sampling frequency.

The corrective action monitoring points shall be as follows:

Zone	Onsite		Offsite
	Monitoring Only	Monitoring & Groundwater Extraction	Monitoring Only
Upper	MW-2A, 4, 5, 30R	MW-18, 19, 20, 21, 22, 23, 24	MW-16, 32
Lower	MW-11	---	---

Additional wells may be installed or added as corrective action monitoring points after the adoption of this Order.

Groundwater Extraction and Treatment System. The Discharger shall record and monitor the following for the groundwater extraction and treatment system:

- a. Hours of operation for the treatment system and any periods of non-operation for each extraction well.
- b. Volume of groundwater extracted and average weekly flow rate for each extraction well.
- c. Volume of groundwater extracted and average weekly flow rate for the groundwater treatment system.
- d. Monitoring of the **influent** and **effluent** of the groundwater treatment system for VOCs by EPA Method 8260B (to be conducted **quarterly**).
- e. Quarterly and semiannual inspection and maintenance of the groundwater extraction and treatment system as required by the WDRs and the most recently approved Operation and Maintenance Plan.
- f. A description of the maintenance work conducted on each well and the treatment system during the monitoring period.

Landfill Gas Extraction Systems. The Discharger shall record and monitor the following for the landfill gas extraction systems (in-fill and perimeter systems):

- a. Hours of operation and percentage of time operating since the last monitoring period for each system.
- b. Average flow rate for the system since the last monitoring period for each system.
- c. Highest, lowest, and average methane and carbon dioxide concentrations since the last monitoring period for each system.
- d. Methane concentration for each landfill gas extraction well and probe (minimum semi-annually).

The Discharger shall report all recorded data and conduct a comprehensive evaluation of the effectiveness of the Corrective Action Program in the Annual Monitoring Report required in Section B.2.j) of this MRP.

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	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	At Closure Completion and Every Five Years
B.7	Financial Assurances Report	31 December	1 June

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. R5-2012-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. Semiannual and annual monitoring reports shall be submitted to the Central Valley Water Board in accordance with the above schedule for the calendar period in which samples were taken or observations made. In addition, the Discharger shall enter all monitoring data and monitoring reports into the online Geotracker database as required by Division 3 of Title 27.

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

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

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

Required Reports

1. **Semiannual Monitoring Report:** Monitoring reports shall be submitted semiannually and are due on **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. Surface water reporting shall include the monthly freeboard measurements in the infiltration pond required in Section A.4 of this MRP.
 - 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 the solid waste monitoring program from Section A.6 of this MRP.
 - j) The results of the corrective action monitoring from Section A.7 of this MRP including a discussion about the performance, inspection, and maintenance of the groundwater extraction and treatment system and results of the influent and effluent monitoring. The discussion shall include a comparison of the effluent concentration of VOCs with the effluent limits in the discharge specifications in section B of the WDRs, including any exceedances and actions taken to prevent recurrence of any exceedances.
 - k) A summary of inspection, leak search, and repair of final covers on any closed landfill units in accordance with an approved final post-closure maintenance plan as required by Standard Closure and Post-Closure Maintenance Specifications G.26 through G.29 of the SPRRs.
2. **Annual Monitoring Report:** The Discharger shall submit an Annual Monitoring Report to the Central Valley Water Board by **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 and the percent capacity remaining in each landfill or module from Section A.6 of this MRP.
- 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 the Corrective Action Program required by this MRP under Section A.7, including the following:
 - i. Cumulative tabulated data for the corrective action system including extracted volumes and flow rates for each groundwater extraction well; hours of operation and average flow rate for the groundwater treatment system and landfill gas extraction systems; high, low and average methane concentration for each landfill gas extraction system; methane concentrations for each landfill gas extraction well and probe; and the monitoring data for the influent and effluent for the groundwater treatment system.
 - ii. Trend analysis for VOCs and any inorganic constituents detected above the concentration limits in each corrective action well.

- iii. Whether the groundwater extraction system is containing and preventing further migration of the VOC plume.
 - iv. Whether any portion of the VOC plume has spread since the previous monitoring period.
 - v. Any adjustments made to the pumping rates or any proposals to add additional extraction wells.
 - vi. Whether any monitoring wells have been impacted by any new VOCs.
 - vii. Whether the concentration of any VOCs, including total VOCs, has increased, decreased, or remained constant.
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 Landfill:** The Discharger shall conduct a survey and submit an iso-settlement map for the closed landfill every

five years pursuant to Title 27, section 21090(e) in accordance with Section A.5.c of this MRP, above.

7. **Financial Assurances Report:** By **1 June** of each year, the Discharger shall submit a copy of the annual financial assurances report due to CalRecycle that updates the financial assurances for closure, post-closure maintenance, and corrective action. Refer to Financial Assurances Specifications F.1 through F.3 of the WDRs.

C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

1. Water Quality Protection Standard Report

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

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

The report shall:

- a. Identify **all distinct bodies of surface and ground water** that could be affected in the event of a release from a waste management unit or portion of a unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.
- b. Include a map showing the monitoring points and background monitoring points for the 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's Water Quality Protection Standard is provided under "Concentration Limits" in Section C.2.4 of this MRP, below.

The Water Quality Protection Standard shall be updated **annually** in the Annual Monitoring Report 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 2007 *Annual Monitoring Report*, and 5-year COCs are due to be monitored again in **2012**.

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 Discharger submitted a 27 February 2012 *Revised Water Quality Protection Standard Report* (WQPS Report). The revised Water Quality Protection Standard (WQPS) represents a substantial update to the detection monitoring program at the landfill and closely follows the procedures in the 2009 USEPA guidance document *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities*. This MRP approves the proposed WQPS and summarizes the methods the Discharger shall use for analyzing the data and calculating concentration limits. Details of the approved methods are included in the 27 February 2012 WPQS Report.

The Discharger shall use interwell statistics for naturally-occurring constituents. The background data set shall be current and historical data from the designated background monitoring wells MW-12, MW-13, and MW-29 for both LF-1 and LF-2. Non-naturally occurring constituents shall have a concentration limit set at the laboratory method detection limit. For wells in the corrective action program, the concentration limits represent cleanup levels to achieve background concentrations. The WQPS shall be updated annually and the updated concentration limits shall be included in the Annual Monitoring Reports.

Outlier Testing: Prior to statistical analysis, the Discharger shall perform outlier testing on the background data using Rosner's Test for data sets with 25 or greater data points and Dixon's Test for data sets with less than 25 data points and remove outliers from the data set for purposes of statistical analysis.

Normality Testing: The Discharger shall then test the data (with outliers removed) for normality using the Shapiro-Wilks Test for data sets with 50 or fewer background data points and using the Shapiro-Francia Test for data sets with greater than 50 background data points.

Non-Normally Distributed Data Sets: For non-normally distributed background data sets with at least 19 background data points, the Discharger shall calculate the concentration limit using the non-parametric tolerance interval method with 95% coverage and 95% confidence. The concentration limit in this case shall be the upper tolerance limit except in the case of pH where both upper and lower tolerance limits shall be calculated. At least 19 background data points are needed for this method in order to produce at least 95% confidence and 95% coverage and to prevent an unacceptable level of false-positives.

Normally Distributed Data Sets: For normally distributed or transformed normally distributed background data sets, the Discharger shall calculate the concentration limit using the parametric tolerance interval method with 95% confidence. The concentration limit shall be the upper tolerance limit except in the case of pH where both the upper and lower tolerance limits shall be calculated.

Other Data Sets and Non-Naturally Occurring Constituents : Methods for non-naturally occurring constituents, non-detect background data, data with fewer than 19 data points, and non-normally distributed data sets are also required. The Discharger shall calculate concentration limits using the following methods that include each of the possible constituent or data instances:

Constituent/Detection/Data Distribution	Method for Conc. Limit
Non-naturally occurring constituents ¹	Method Detection Limit
Naturally occurring ² , non-detect in all background data	Practical Quantitation Limit (PQL)
Naturally occurring, less than 19 data points, at least one detection in background	Greater of the PQL and maximum background concentration
Naturally occurring, at least 19 data points, greater than 50% non-detects in background data (but at least one detection in background)	Greater of the PQL and maximum background concentration
Naturally occurring, at least 19 data points, fewer than 50% non-detects in background data, data set not normally distributed	Non-parametric tolerance interval method at 95% coverage and 95% confidence
Naturally occurring, at least 19 data points, data set normally distributed	Parametric interwell tolerance interval method with 95% coverage and 95% confidence

¹ Non-naturally occurring include: VOCs, SVOCs, Pesticides, Herbicides, PCBs.

² Naturally occurring include: inorganic constituents, TDS, EC, metals, pH.

The concentration limits calculated in the WQPS Report using the above methods are presented in the tables below, but may change based on new background data as the concentration limits are required to be updated annually with the updated limits to be presented in the Annual Monitoring Report.

Parameter	Current Concentration Limit	Basis
pH	6.64-7.75	Parametric Tolerance Limit
Electrical Conductivity	1,270 umhos/cm	Parametric Tolerance Limit
Total Dissolved Solids	1,020 mg/L	Non-Parametric Tolerance Limit
Chloride	69 mg/L	Non-Parametric Tolerance Limit
Nitrate as N	17 mg/L	Non-Parametric Tolerance Limit
Bicarbonate	750 mg/L	Non-Parametric Tolerance Limit
Sulfate	81 mg/L	Non-Parametric Tolerance Limit
Calcium	157 m/L	Non-Parametric Tolerance Limit
Magnesium	79 mg/L	Non-Parametric Tolerance Limit

Parameter	Current Concentration Limit	Basis
Sodium	40 mg/L	Non-Parametric Tolerance Limit
Potassium	7.8 mg/L	Non-Parametric Tolerance Limit
Carbonate	70 mg/L	Highest of PQL and Max Concentration
Aluminum	1,900 ug/L	Highest of PQL and Max Concentration
Antimony	110 ug/L	Highest of PQL and Max Concentration
Arsenic	48 ug/L	Highest of PQL and Max Concentration
Barium	300 ug/L	Highest of PQL and Max Concentration
Beryllium	10 ug/L	Highest of PQL and Max Concentration
Cadmium	10 ug/L	PQL
Chromium	10 ug/L	PQL
Cobalt	50 ug/L	PQL
Copper	10 ug/L	PQL
Cyanide	7 ug/L	Highest of PQL and Max Concentration
Iron	1,400 ug/L	Highest of PQL and Max Concentration
Lead	16 ug/L	Highest of PQL and Max Concentration
Manganese	160 ug/L	Highest of PQL and Max Concentration
Mercury	0.20 ug/L	PQL
Nickel	5.2 ug/L	PQL
Selenium	4 ug/L	Highest of PQL and Max Concentration
Silver	10 ug/L	PQL
Sulfide	20 ug/L	PQL
Thallium	2.0 ug/L	PQL
Tin	50 ug/L	PQL
Vandium	10 ug/L	PQL
Zinc	37 ug/L	PQL
Total Organic Carbon	New 5-yr COC	To be proposed after 2012 sampling
Volatile Organic Compounds	MDL	Non-Statistical
Semi-Volatile Organic Compounds	MDL	Non-Statistical
Organophosphorus Compounds	MDL	Non-Statistical
Chlorophenoxy Herbicides	MDL	Non-Statistical

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>
LF-1	MW-2A, 4, 5, 18, 19, 20, 21, 22, 23, 24 for the upper water-bearing zone
LF-1	MW-8, 9, and 11 for lower water-bearing zone
LF-2	MW-30R and MW-31R

The point of compliance for surface water monitoring is the infiltration pond.

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)

wlb

TABLE I
GROUNDWATER DETECTION 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	Semiannual
Temperature	°F	Semiannual ¹	Semiannual
Electrical Conductivity	umhos/cm	Semiannual ¹	Semiannual
pH	pH units	Semiannual ¹	Semiannual
Turbidity	Turbidity units	Semiannual ¹	Semiannual
Monitoring Parameters			
Total Dissolved Solids (TDS)	mg/L ²	Semiannual ¹	Semiannual
Chloride	mg/L	Semiannual ¹	Semiannual
Carbonate	mg/L	Semiannual ¹	Semiannual
Bicarbonate	mg/L	Semiannual ¹	Semiannual
Nitrate - Nitrogen	mg/L	Semiannual ¹	Semiannual
Sulfate	mg/L	Semiannual ¹	Semiannual
Calcium	mg/L	Semiannual ¹	Semiannual
Magnesium	mg/L	Semiannual ¹	Semiannual
Potassium	mg/L	Semiannual ¹	Semiannual
Sodium	mg/L	Semiannual ¹	Semiannual
Volatile Organic Compounds (USEPA Method 8260B, short list, see Table V)	ug/L ³	Semiannual ¹	Semiannual
5-Year Constituents of Concern (see Table VI)			
Total Organic Carbon	mg/L	5 years	1 February 2013
Inorganics (dissolved)	ug/L	5 years	and every 5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	ug/L	5 years	thereafter
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 Corrective action wells MW-2A, 4, 5, 11, 16, 18 through 24, and 30R shall be sampled **quarterly** for two years during 2013 to 2015 as required under Section A.7 of this MRP.

² Milligrams per liter

³ Micrograms per liter

TABLE II
UNSATURATED ZONE DETECTION MONITORING PROGRAM

Pan Lysimeter LYS-1¹

<u>Parameter</u>	<u>Units</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Field Parameters			
Electrical Conductivity	umhos/cm	Semiannual	Semiannual
pH	pH units	Semiannual	Semiannual
Volume of liquid removed	gallons	Monthly	Semiannual
Monitoring Parameters			
Total Dissolved Solids (TDS)	mg/L	Semiannual	Semiannual
Chloride	mg/L	Semiannual	Semiannual
Carbonate	mg/L	Semiannual	Semiannual
Bicarbonate	mg/L	Semiannual	Semiannual
Nitrate - Nitrogen	mg/L	Semiannual	Semiannual
Sulfate	mg/L	Semiannual	Semiannual
Calcium	mg/L	Semiannual	Semiannual
Magnesium	mg/L	Semiannual	Semiannual
Potassium	mg/L	Semiannual	Semiannual
Sodium	mg/L	Semiannual	Semiannual
Volatile Organic Compounds (USEPA Method 8260B, short list, see Table V)	ug/L	Semiannual	Semiannual
5-Year Constituents of Concern (see Table VI)			
Total Organic Carbon	mg/L	5 years	1 February 2013
Inorganics (dissolved)	ug/L	5 years	and every 5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	ug/L	5 years	thereafter
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 Pan lysimeter LYS-1 shall be inspected for the presence of liquid **monthly**. 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			
Liquid Elevation in Sump ¹	Feet and Hundredths	Daily	Semiannual
Total Flow	Gallons	Monthly	Semiannual
Flow Rate	Gallons/Day	Monthly	Semiannual
Electrical Conductivity	umhos/cm	Quarterly	Semiannual
pH	pH units	Quarterly	Semiannual
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 VI)			
Total Organic Carbon	mg/L	5 years	1 February 2013
Inorganics (dissolved)	ug/L	5 years	and every 5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	ug/L	5 years	thereafter
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	" "
LCRS Testing ³	---	Annually	Annually

¹ Leachate liquid levels in the LF-2 sump shall be measured daily except on weekends or holidays. Leachate in the LCRS sump shall then be sampled for all parameters and constituents in accordance with the frequencies listed in Table III whenever liquid is present.

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 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			
Freeboard in Infiltration Pond	Feet and tenths	Monthly	Semiannual
Electrical Conductivity	umhos/cm	Semiannual	Semiannual
pH	pH units	Semiannual	Semiannual
Turbidity	Turbidity units	Semiannual	Semiannual
Flow to Waters of U.S.	Yes or No	Semiannual	Semiannual
Monitoring Parameters			
Total Dissolved Solids (TDS)	mg/L	Semiannual	Semiannual
Carbonate	mg/L	Semiannual	Semiannual
Bicarbonate	mg/L	Semiannual	Semiannual
Chloride	mg/L	Semiannual	Semiannual
Nitrate - Nitrogen	mg/L	Semiannual	Semiannual
Sulfate	mg/L	Semiannual	Semiannual
Calcium	mg/L	Semiannual	Semiannual
Magnesium	mg/L	Semiannual	Semiannual
Potassium	mg/L	Semiannual	Semiannual
Sodium	mg/L	Semiannual	Semiannual
Volatile Organic Compounds (USEPA Method 8260B, short list, see Table V)	ug/L	Semiannual	Semiannual
5-Year Constituents of Concern (see Table VI)			
Total Organic Carbon	mg/L	5 years	1 February 2013
Inorganics (dissolved)	ug/L	5 years	and every 5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	ug/L	5 years	thereafter
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 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). Reporting shall include whether there was flow from the facility to waters of the U.S. when the samples were collected.

TABLE V

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 (Bromomethane)
Methyl chloride (Chloromethane)

TABLE V
MONITORING PARAMETERS FOR DETECTION MONITORING

Continued

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

TABLE VI
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	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 VI

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 VI

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 VI

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 VI

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 VI

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