

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2003-0020

WASTE DISCHARGE REQUIREMENTS
FOR
COUNTY OF SAN JOAQUIN AND FOOTHILL SANITARY LANDFILL, INC.
FOR
CONSTRUCTION, OPERATION, CLOSURE AND EVALUATION MONITORING
FOOTHILL SANITARY LANDFILL, MUNICIPAL SOLID WASTE (CLASS III)
SAN JOAQUIN COUNTY

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

1. The County of San Joaquin owns and Foothill Sanitary Landfill Inc. operates the Foothill Sanitary Landfill. The owner and operator are hereafter referred to as Discharger. The facility is a municipal solid waste landfill about 1 mile south of Shelton Road, in Section 12 and 13, T2N, R9E, MDB&M, as shown in Attachment A, which is incorporated herein and made part of this Order.
2. The facility is comprised of an 800-acre parcel (Assessors Parcel No. 093-44-01) containing a single Waste Management Unit. This Unit is comprised of two areas: LF-1 and LF-2. LF-1 contains a single, unlined module (referred to as "Module I"), covering approximately 80 acres. LF-2 is comprised of multiple lined modules, the first of which (Module 1) is planned for completion in 2003.
3. Construction of Module 1 of LF-2 is intended to include approximately 34 acres lined module immediately south and adjacent to LF-1, as shown on Attachment B, which is incorporated herein and made part of this order. LF-2 modules will overlap onto LF-1 as each module is lined and filled until final closure of the Unit. LF-1 is required to be closed due to VOCs in groundwater and because it is not lined. The size of Module 2 and future modules in area LF-2 will be selected by the Discharger in accordance with the refuse disposal rate. Future Module 1 of LF-2 is currently being excavated as part of landfill operations. Soil is being excavated from the area of Module 1, LF-2 for use as daily and intermediate cover on LF-1 until LF-1 is closed in the near future. It is intended that this procedure will be applied to all future modules.
4. On September 23, 1994, the Board issued Order No. 94-258, in which the facility was classified as a Class III waste disposal site for the discharge of municipal solid wastes in accordance with the regulations in effect when the order was issued.
5. On November 6, 2002, the Discharger submitted an Evaluation Monitoring Plan, which describes the criteria for delineating the nature and extent of groundwater pollution. Because Module "I" is unlined and assuredly the source of contamination (see Finding No. 29), these WDRs require the closure of Module "I" as part of the corrective action measures.

SITE DESCRIPTION

6. The measured hydraulic conductivity of the native soils underlying the Unit ranges between 5×10^{-3} and 1.4×10^{-7} (undisturbed samples).
7. The Central Valley Coast Range Fault, approximately 62 km from the site, has a maximum probable earthquake (MPE) of 6.5 on the Richter Scale. The San Andreas Fault, approximately 135 km distant, has a MPE of 8.0. Both events have maximum probable accelerations at the site of 0.05 g (see information in the Liner Report of Waste Discharge, Appendix F). A site-specific seismic hazard report was prepared for FSL in April 2002.
8. Land uses within 1,000 feet of the facility are agricultural.
9. The facility receives an average of about 18 inches of precipitation per year as determined from an isohyetal map of San Joaquin County developed in "Storm Drainage Study and Master Plan," San Joaquin County, January 1973. The mean pan evaporation is 78 inches per year as determined by the California Department of Water Resources for the station at the Oakdale Woodward Dam.
10. The 100-year, 24-hour precipitation event is estimated to be 3.9 inches, based on data published by the Department of Water Resources.
11. The waste management unit is not within a 100-year flood plain based on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, Community - Panel Number 060299-0365A, Effective Date May 15, 1980.
12. The active life of the facility is estimated to allow disposal until Year 2050, based on current disposal rates and capacities. The total capacity of the landfill is approximately 102 million cubic yards. The estimated service life will change if disposal rates differ significantly than those predicted.
13. There are eight domestic or agricultural groundwater supply wells within one mile of the site. Three of these eight wells have information maintained by the California Department of Water Resources that indicates they are domestic wells (ID Nos. 02N09E02H, 02N09E11A, and 02N09E11A1). There is one well within the permitted boundary of the site (LW-1). This well is used for agricultural or landfill operational water and for domestic use at the on-site caretaker house. This well shall be included in the monitoring and reporting program, but shall not be considered a Point of Compliance.

WASTE AND SITE CLASSIFICATION

14. The Discharger discharges non-hazardous municipal solid wastes, which are defined in §20164 of Title 27. Nonhazardous solid wastes include municipal solid wastes, as referred to in the Code of Federal Regulations, Title 40, Part 258.2.

15. The site characteristics where the Unit is located (see Finding No. 6) are not suitable for a new Class III landfill contained in §20260(a) and (b)(1) of Title 27 without the construction of additional waste containment features in accordance with §20260(b)(2) of Title 27 and State Water Resources Control Board Resolution No. 93-62.

SURFACE AND GROUND WATER CONDITIONS

16. The Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins, Fourth Edition 1998, designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.
17. Surface drainage is intermittent creeks, with storm waters draining generally in a westerly direction to enter the Delta via either Mormon Slough or Duck Creek, which flow into the San Joaquin River in the Lower Calaveras Hydrologic Area (531.30) of the San Joaquin Hydrologic Basin.
18. The landfill is located in northeastern San Joaquin County. The existing and potential designated beneficial uses of surface water, as specified in the Basin Plan, are municipal and domestic supply, agriculture (stock watering and irrigation), industrial (processing and service supply), water contact recreation (REC-1) and non-contact water recreation (REC-2), warm and cold freshwater habitat, warm and cold water migration of aquatic organisms, warm and cold water spawning, wildlife habitat, preservation of rare, threatened and endangered species, and groundwater recharge.
19. The first encountered groundwater is approximately 120 to 150 feet below the native ground surface. Groundwater elevations range from about 46 to 61 feet MSL. The groundwater is unconfined or partially confined. Groundwater elevations fluctuate seasonally less than one foot.
20. The direction of groundwater flow is toward the southwest. The average groundwater gradient is approximately 0.002 foot per foot.
21. Monitoring data indicates background groundwater quality has an electrical conductivity (EC) ranging between 153 and 710 micromhos/cm, with total dissolved solids (TDS) ranging between 151 and 250 mg/l.
22. All groundwaters in the San Joaquin River Basin are considered suitable or potentially suitable, at a minimum, for municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply.

GROUNDWATER MONITORING, SURFACE WATER AND UNSATURATED ZONE MONITORING

23. The current groundwater monitoring system is comprised of an upgradient well (MW-1) and downgradient wells MW-2 and MW-3. Because of its current location in the Module 1 expansion footprint, MW-2 will be abandoned in accordance with standard practices.

Additional groundwater monitoring points proposed for Module 1 include MW-2R near the southwest corner of the module as shown on Attachment B. This downgradient location was selected because the groundwater flow direction beneath the site has historically been toward the southwest. The Discharger shall include the one other well on the property (domestic /supply) as part of the monitoring and reporting program.

24. The current Module "I" does not include unsaturated zone monitoring. Unsaturated zone lysimeter LZ-1 is proposed to be installed near MW-1 for background monitoring data. Unsaturated zone lysimeters LZ-2 through LZ-4 are proposed to be installed beneath Module 1, under the leachate sump (LZ-2), under one LCRS trench (LZ-3), and under the southwest area of the base liner system (LZ-4). The secondary containment system beneath the leachate sump for Module 1 is identified as L-1. The lysimeters have access ports available at the surface for sampling of soil-pore liquids.
25. Surface water flow enters the Foothill Landfill property boundary as an intermittent water way and then flows offsite to a pond. Surface water sampling location S-1 (upstream) is located where the water way enters the property. The downstream sampling location S-2 captures water quality that runs off the facility prior to the stockpond. Cattle graze on the property along the water way and the stockpond.
26. The drainage management system is a complex system. The site development plans utilize 12-foot-wide drainage channels along the landfill perimeter to handle storm water runoff from the Module "I" landfill. The channels will discharge to sedimentation/detention basin(s) for sediment control, and to minimize stormwater flows off site. Initial construction of Module 1 will include a 20-foot-wide drainage bench constructed along the common edge of the existing landfill to divert drainage, and 50-foot wide perimeter berms will be constructed along the other three sides of the module for access and drainage. Initial excavations of Module 1 will create a temporary sedimentation/detention basin for the evaporation, and if needed, pumped discharger to the natural downgradient drainage swale. Stormwater from onsite soil Stockpile 1 west and southwest of Module 1 will be retained in a temporary southeast basin. Stockpile 2 is near the south site boundary where a sedimentation/detention basin will be constructed within the 200-foot setback area of the landfill site to control sediment, before stormwater release back to a natural swale.
27. The Discharger's proposed detection monitoring program for groundwater and soil-pore liquids in the unsaturated zone at this Unit satisfies the requirements of Title 27.
28. The Discharger proposes to install a landfill gas monitoring system that also functions as a soil gas extraction trench beneath the single-composite liner as horizontal soil gas piping around the base of the perimeter and below the center of Module 1 to monitor the unsaturated zone for the presence of VOCs. Horizontal LFG collectors will also be installed in the first refuse lift, a minimum 15 feet above the liner. These two systems will have riser pipes to the surface for sampling and/or future collection of LFG, as applicable. The horizontal LFG collector pipes will be surveyed to allow for future connection by drilling.

29. The Discharger proposes to install ten soil-pore gas monitoring wells around the landfill modules, and subsequent modules, to monitor the unsaturated zone for VOCs, as shown on Attachment B. If VOCs are detected, an evaluation-monitoring program will be required pursuant to Title 27.
30. The Discharger's proposed detection monitoring program for sampling soil-pore gas in the unsaturated zone at this Unit satisfies the requirement of Title 27 for monitoring landfill gases.
31. Section 20164 of Title 27 defines: "Containment" = means the use of waste management unit characteristics or installed systems and structures to prevent or restrict the release of waste constituents, including waste constituents mobilized as a component of leachate or of landfill gas.
32. Volatile organic compounds (VOCs) are often detected in a release from a landfill, and are the primary waste constituents detected in groundwater beneath a municipal solid waste landfill in cases of a release. Since volatile organic compounds are not naturally occurring and thus have no background value, they are not amenable to the statistical analysis procedures contained in Title 27 for the determination of a release of wastes from a Unit.
33. Sections 20415(e)(8) and (9) of Title 27 provide for the non-statistical evaluation of monitoring data that will provide the best assurance of the earliest possible detection of a release from a Unit in accordance with §20415(b)(1)(B)2.-4. of Title 27. However, Title 27 does not specify a specific method for non-statistical evaluation of monitoring data.
34. The Board may specify a non-statistical data analysis method pursuant to Section 20080(a)(1) of Title 27. Section 13360(a)(1) of the California Water Code allows the Board to specify requirements to protect underground or surface waters from leakage from a solid waste site, which includes a method to provide the best assurance of determining the earliest possible detection of a release.
35. In order to provide the best assurance of the earliest possible detection of a release of non-naturally occurring waste constituents from a Unit, this Order specifies a non-statistical method for the evaluation of monitoring data.
36. The specified non-statistical method for evaluation of monitoring data provides two criteria (or triggers) for making the determination that there has been a release of non-naturally occurring waste constituents from a Unit. The presence of two non-naturally occurring waste constituents above their respective method detection limit (MDL), or one non-naturally occurring waste constituent detected above its practical quantitation limit (PQL), indicates that a release of waste from a Unit has occurred. Following an indication of a release, verification testing will be conducted to determine whether there has been a release from the Unit, or there is a source of the detected constituents other than the landfill, or the detection was a false detection. Although the detection of one non-naturally occurring waste

constituent above its MDL is sufficient to provide for the earliest possible detection of a release, the detection of two non-naturally occurring waste constituents above the MDL as a trigger is appropriate due to the higher risk of false-positive analytical results and the corresponding increase in sampling and analytical expenses from the use of one non-naturally occurring waste constituent above its MDL as a trigger.

GROUNDWATER SURFACE WATER AND UNSATURATED ZONE DEGRADATION

37. The monitoring results indicate that landfill gas (LFG) from the unlined Module "I" at the Foothill Landfill has impacted groundwater. The volatile organic compounds (VOC) have been confirmed in well MW-3 and the VOCs that are most prevalent are Trichloroethene (TCE) and 1,1-Dichloroethene (1,1-DCE). TCE had eleven quantified detections with a maximum concentration of 4.0 micrograms per liter ($\mu\text{g/l}$) and an average concentration of 0.78 $\mu\text{g/l}$. 1,1-DCE had six quantified detections with a maximum concentration of 0.32 $\mu\text{g/l}$ and an average concentration of 0.16 $\mu\text{g/l}$.
38. Title 27 requires the Discharger submit to the Board an engineering feasibility study for a corrective action program necessary to meet the requirements of §20430. At a minimum, the technologic and economic feasibility study shall contain a detailed description of the corrective action measures that could be taken to achieve background concentrations for all Constituents of Concern and the closure of Module "I."

LINER PERFORMANCE DEMONSTRATION

39. On 15 September 2000 the Board adopted Resolution No. 5-00-213 Request For The State Water Resources Control Board To Review The Adequacy Of The Prescriptive Design Requirements For Landfill Waste Containment Systems To Meet The Performance Standards Of Title 27. The State Board responded, in part, that "a single composite liner system continues to be an adequate minimum standard" however, the Board "should require a more stringent design in a case where it determines that the minimum design will not provide adequate protection to a given body of groundwater."
40. In a letter dated 17 April 2001, the Executive Officer notified Owners and Operators of Solid Waste Landfills that "the Board will require a demonstration that any proposed landfill liner system to be constructed after 1 January 2002 will comply with Title 27 performance standards. A thorough evaluation of site-specific factors and cost/benefit analysis of single, double and triple composite liners will likely be necessary."
41. The Discharger provided a single-composite liner system leak performance demonstration. The leakage rate through the proposed liner was calculated from the available head over the liner and assumed quantity of leaks. The maximum available hydraulic head of leachate on the HDPE liner was estimated to be to be 1.7 inches (HELP-3 model), based on the leachate reaching the LCRS system of Module 1 and the removal of the leachate by the LCRS. These

calculations assume that there will be one geomembrane defect of a centimeter diameter hole per acre of liner placed. This geomembrane defect assumption was based on current state-of-practice construction quality assurance for landfill liners. Based on these conditions, a leak rate of 0.0005 gal/acre-day was estimated using the HELP-3 computer model. The calculated leakage rate for the prescriptive liner 60-mil HDPE/24-inch clay with a hydraulic head of 12 inches (Subtitle D) was 0.81 gal/acre-day.

42. The VLEACH model was used to determine the potential for groundwater contamination from a leak in the liner system. VLEACH simulates the movement of potential contaminants among three phases: (1) gas phase; (2) liquid phase; and (3) as an adsorbed compound on the solid phase (soil). The maximum concentration of modeled constituents in groundwater after the modeling period of 100 years was calculated to be below 0.1 ppb, which is below the laboratory detection limits for the modeled constituents. The modeled constituents included, but were not limited to, benzene, 1,2-dichloroethane, chloride, and hexavalent chromium.
43. The Construction Quality Assurance (CQA) manual incorporates specific testing protocols, inspection, and documentation requirements in accordance with Section 20324 of Title 27, to provide evidence that the construction proceeds in accordance with the design plans and specifications, and that the system will meet or exceed the design intent and regulatory performance standards.
44. The Discharger will perform a state-of-practice geoelectric liner leak detection survey for the GCL. The leak testing enables location of defects, which might impact groundwater and the unsaturated zone, and construction contractor repair of the defects prior to the acceptance of the liner construction project.

CONSTRUCTION AND ENGINEERED ALTERNATIVE

45. On 17 June 1993, the State Water Resources Control Board adopted Resolution No. 93-62 implementing a State Policy for the construction, monitoring, and operation of municipal solid waste landfills that is consistent with the federal municipal solid waste regulations promulgated under Title 40, Code of Federal Regulations, Part 258 (Subtitle D).
46. Resolution No. 93-62 requires the construction of a specified composite liner system at new municipal solid waste landfills, or expansion areas of existing municipal solid waste landfills, that receive wastes after 9 October 1993.
47. Resolution No. 93-62 also allows the Board to consider the approval of engineered alternatives to the prescriptive standard. Section III.A.b. of Resolution No. 93-62 requires that the engineered alternative liner systems be of a composite design similar to the prescriptive standard.
48. Section 20080(b) of Title 27 allows the Board to consider the approval of an engineered alternative to the prescriptive standard. In order to approve an engineered alternative in

accordance with §20080(c)(1) and (2), the Discharger must demonstrate that the prescriptive design is unreasonably and unnecessarily burdensome and will cost substantially more than an alternative which will meet the criteria contained in §20080(b), or would be impractical and would not promote attainment of applicable performance standards. The Discharger must also demonstrate that the proposed engineered alternative liner system(s) {is/are} consistent with the performance goal addressed by the particular prescriptive standard, and provides protection against water quality impairment equivalent to the prescriptive standard in accordance with §20080(b)(2) of Title 27.

49. Section 13360(a)(1) of the California Water Code allows the Board to specify the design, type of construction, and/or particular manner in which compliance must be met in waste discharge requirements or orders for the discharge of waste at solid waste disposal facilities.
50. The Discharger proposes a liner system which will be designed, constructed, and operated to be capable of preventing degradation of waters of the state as a result of waste discharges to the landfills, including operations, closure, and the postclosure maintenance period in accordance with the criteria set forth in Title 27 for a Class III landfill, and the provisions in State Water Resources Control Board Resolution No. 93-62 for municipal solid wastes.
51. The Discharger submitted a Report of Waste Discharge requesting approval of an engineered alternative to the prescriptive liner requirements.
52. The engineered alternative proposed by the Discharger for the primary bottom liner system of Module 1 and future modules consists of (from top to bottom): a 2-foot-thick soil operations layer; an 8 oz./synthetic nonwoven geotextile separator/filter; a 0.75-foot-thick gravel drainage layer; leachate collection troughs with 4-inch-diameter piping; a 60-mil HDPE geomembrane; a geosynthetic clay liner (GCL), and a 12 inch (1-foot) thick prepared subgrade.
53. Side slope liner systems are proposed to be constructed of (from top to bottom): a 2-foot-thick soil operations layer; a geocomposite drain layer with nonwoven geotextile separator/filter; a 60-mil HDPE geomembrane; a GCL; and a prepared subgrade. The subgrade will be prepared in an appropriate manner using accepted engineering and construction methods so as to provide a surface that is smooth and free from rocks, sticks, and other debris that could damage or otherwise limit the performance of the geosynthetic clay layer and/or geomembrane, and certified in accordance with this Order and the approved CQA Plan.
54. The Discharger adequately demonstrated that construction of a Subtitle D prescriptive standard liner would be unreasonable and unnecessarily burdensome when compared to the proposed engineered alternative design. There is no clay source on-site and the cost of importing clay from off-site or mixing on-site soils with bentonite would cost substantially more than the alternative design. The Discharger has demonstrated that the proposed

engineered alternative is consistent with the performance goals of the prescriptive standard and affords equivalent protection against water quality impairment.

55. The leachate collection and removal system collection components consist of (from top to bottom):
 - 2-foot thick soil operations layer;
 - 8-oz/sy nonwoven geotextile separator/filter;
 - 0.75-foot-thick gravel drainage layer on base areas, and a geocomposite drain on the side slopes; and
 - Leachate collection troughs with 4- and 6-inch-diameter lateral and header piping, surrounded with drainage gravel.
56. Each lateral leachate pipe is equipped with a pipe riser at each end for inspection, and cleaning if necessary, during the operational life of the module. A wire rope or cable will also be installed in each leachate lateral pipe to enable pull through of a video camera for LCRS inspection, if necessary.
57. All lateral and header leachate pipes are sized for flow capacities at least twice peak design flows from modeled “worst case” peak leachate production. The peak monthly leachate production, based on leachate removal records at the nearby North County Recycling Center and Sanitary Landfill is 200,000 gallons per month.
58. A 4-foot deep leachate removal sump allows for a 3-foot depth of leachate over a 2-foot deep monitoring trench, without leachate backup into the LCRS collection troughs. A leachate pipe riser is provided for leachate monitoring and removal. The leachate removal pump system includes leachate level monitoring sensors, pump, automatic pump controls, and a flow system to record leachate volumes removed. An above ground leachate storage tank facility will receive leachate pumped from the sump, in advance of leachate handling for disposal.
59. The sump area is underlain with a secondary composite liner system, equipped with a monitoring sump and pump system to provide additional protection against the higher leachate head necessary within the leachate sump area. The system is designed to remove, far in excess of estimated peak flows, to preclude leachate head build-up on the base liner beyond the limits of the sump. A monitoring riser 12 inches in diameter is provided to enable monitoring for leachate, and its removal, if present.
60. Construction will proceed only after all applicable construction quality assurance plans have been approved by Executive Officer.

CEQA AND OTHER CONSIDERATIONS

61. The action to revise waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality Act (CEQA), Public Resource Code §21000, et seq., and the CEQA guidelines, in accordance with Title 14, CCR, §15301.
62. This order implements:
 - a. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition.
 - b. The prescriptive standards and performance goals of Chapters 1 through 7, Subdivision 1, Division 2, Title 27, of the California Code of Regulations, effective 18 July 1997, and subsequent revisions;
 - c. The prescriptive standards and performance criteria of RCRA Subtitle D, Part 258; and;
 - d. State Water Resources Control Board Resolution No. 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*, adopted 17 June 1993.

PROCEDURAL REQUIREMENTS

63. All local agencies with jurisdiction to regulate land use, solid waste disposal, air pollution, and to protect public health have approved the use of this site for the discharges of waste to land stated herein.
64. The Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
65. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.
66. Any person affected by this action of the Regional Board may petition the State Water Resources Control Board to review the action in accordance with Sections 2050 through 2068, Title 23, California Code of Regulations. The petition must be received by the State Water Resources Control Board, Office of Chief Counsel, P.O. Box 100, Sacramento, California 95812, within 30 days of the date of issuance of this Order. Copies of the laws and regulations applicable to the filing of a petition are available on the Internet at http://www.swrcb.ca.gov/water_laws/index.html and will be provided on request.

IT IS HEREBY ORDERED, pursuant to Sections 13263 and 13267 of the California Water Code, that Order No. 94-258 is rescinded, and that the County of San Joaquin, its agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted there under, shall comply with the following:

A. PROHIBITIONS

1. The discharge of 'hazardous waste' or 'designated waste' is prohibited. For the purposes of this Order, the term 'hazardous waste' is as defined in Title 23, California Code of Regulations, Section 2510 et seq., and 'designated waste' is as defined in Title 27.
2. The discharge of wastes outside of a Unit or portions of a Unit specifically designed for their containment is prohibited.
3. The discharge of waste to a closed Unit is prohibited. However, placement of waste over the surface of a closed module, in accordance with an approved Closure Plan and Liner Demonstration, may be acceptable.
4. The discharge shall not cause the release of pollutants, or waste constituents in a manner which could cause a condition of nuisance, degradation, contamination, or pollution of groundwater to occur, as indicated by the most appropriate statistical or nonstatistical data analysis method and retest method listed in this Order, the Monitoring and Reporting Program, or the Standard Provisions and Reporting Requirements.
5. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.
6. The discharge of landfill leachate and or gas condensate liquids from sources other than the Unit is prohibited pursuant to 40 CFR §258.28.
7. The discharge shall not cause degradation of the waters of the state by release of waste constituents in soil-pore gas, soil-pore liquid, soil, or other geologic materials outside of the Unit if such waste constituents could migrate to waters of the State; in either the liquid or the gaseous phase, and cause a condition of nuisance, degradation, contamination, or pollution.

B. DISCHARGE SPECIFICATIONS

1. Nonhazardous wastes shall be discharged to a Module equipped with an approved composite liner containment system, which meets the requirements for both liners and leachate collection, and removal systems specific under D. Construction Specifications, or as approved by the Board.
2. The discharge shall remain within the designated disposal area at all times.

3. The waste discharged to the initial two feet of all new waste management units or any expansion of the existing waste management unit, as measured from the top of the operations layer of the liner system, shall consist only of "packer waste," waste delivered in trailers from waste transfer stations, or other waste that is free of objects excluding that would pose a danger of physical damage to the liner system.
4. Landfill leachate and/or gas condensate fluids derived from the Foothill Landfill's collection and containment systems shall be discharged to a Module equipped with a composite liner containment system which meets the requirements for both liners and leachate collection and removal systems under D. Construction Specifications. Therefore, Module "I" is restricted from receiving these fluids.
5. The depth of fluid over any portion of the leachate collection and removal system shall not exceed 30 cm (~1 foot). The leachate collection sump may be designed to include a small limited area for the leachate removal pump where the fluid depth may exceed 30 cm. The leachate removal pump sump can be no larger or contain a fluid depth greater than the minimum needed for efficient pump operation.

C. FACILITY SPECIFICATIONS

1. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order.
2. The Discharger shall immediately notify the Board of any flooding, unpermitted discharge of waste off-site, equipment failure, slope failure, or other change in site conditions that could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.
3. Water used for facility maintenance shall be limited to the minimum amount necessary for dust control and construction.
4. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.
5. Methane and other landfill gases shall be adequately vented, removed from the Unit, or otherwise controlled, as needed, to prevent adverse health effects, nuisance conditions, or the impairment of the beneficial uses of surface water or groundwater due to migration through the unsaturated zone.
6. Surface drainage within the waste management facility either shall be contained on-site or be discharged in accordance with applicable storm water regulations.
7. The Discharger shall maintain a *Storm Water Pollution Prevention Plan and Monitoring Program and Reporting Requirements* in accordance with State Water Resources Control Board Order No. 97-03-DWQ, or retain all storm water on-site.

8. Soil cover shall be provided and maintained, in addition to intermediate cover, on surfaces that have reached final elevations or which are not at final elevations but which will not receive refuse within two years. Surfaces shall be maintained with the following soil cover thickness:

Slopes 5:1 and less: a total 3 feet of compacted soil.

Slopes steeper than 5:1: a total 2 feet of compacted soil.

Soil thickness shall be after compaction to 85% relative density.

9. Interim and partial cover over wastes discharged to a landfill shall be designed and constructed to minimize percolation of liquids through the wastes.

D. CONSTRUCTION SPECIFICATIONS

1. The Discharger shall submit for Executive Officer review and approval **prior to** construction, design plans and specifications for new Units and construction of new modules within existing Units, that include the following:
 - a. A Construction Quality Assurance Plan meeting the requirements of §20324 of Title 27; and
 - b. A geotechnical evaluation of the area soils, evaluating their use as the base layer; and
 - c. An unsaturated zone monitoring system, which is demonstrated to remain effective throughout the active life, closure, and postclosure maintenance periods of the Unit, which shall be installed beneath the composite liner system in accordance with §20415(d) of Title 27.
2. Both the bottom liner and side slope liner of all new Units and lateral expansion areas of existing Units shall be constructed in accordance with one of the following composite liner designs:
 - a. The prescriptive standard design which consists of a lower compacted soil layer that is a minimum of two feet thick with a hydraulic conductivity of 1×10^{-7} cm/sec or less and has a minimum relative compaction of 90%. Immediately above the compacted soil layer, and in direct and uniform contact with the soil layer, shall be a synthetic flexible membrane component that shall be at least 40-mil thick (or at least 60-mil thick if composed of high density polyethylene [HDPE]), which is immediately overlain with a leachate collection and removal system. A soil operations layer shall be placed above the leachate collection and removal system.

3. Both the bottom liner and side slope liner of all new Units and lateral expansion areas of existing Units shall be constructed in accordance with one of the following composite liner designs:
 - a. The prescriptive standard design which consists of a lower compacted soil layer that is a minimum of two feet thick with a hydraulic conductivity of 1×10^{-7} cm/sec or less and has a minimum relative compaction of 90%. Immediately above the compacted soil layer, and in direct and uniform contact with the soil layer, shall be a synthetic flexible membrane component that shall be at least 40-mil thick (or at least 60-mil thick if composed of high density polyethylene [HDPE]), which is immediately overlain with a leachate collection and removal system. A soil operations layer shall be placed above the leachate collection and removal system.
 - b. An engineered alternative composite bottom liner system that is comprised, in ascending order, of the following:
 - 1) A twelve-inch thick engineered soil foundation layer that shall be constructed of select fine-grained soil materials which shall be compacted in lifts of six inches or less to 90% of maximum dry density at 0% to 4% wet of optimum moisture content, in accordance with the approved construction quality assurance plan, and shall be either:
 - a) Compacted to attain a hydraulic conductivity of 1×10^{-5} cm/sec or less; or
 - b) Meet the following gradation criteria:
 - (a) A maximum size of 3/8-inch;
 - (b) At least 30% of the material, by dry weight, passing the No. 200 U. S. Standard sieve;
 - (c) A gradation series (i.e., well-graded) that is amenable to compaction; and
 - 2) A nonwoven bottom geotextile, which may be part of the geosynthetic clay layer (GCL).
 - 3) A GCL that shall exhibit appropriate strength characteristics (hydrated) to accommodate stresses associated with specific landfill design parameters, with particular attention to interface, long-term creep shear, and bearing capacity.
 - 4) A 60-mil thick synthetic flexible membrane of HDPE.
 - 5) 0.75-foot-thick gravel drainage layer on base areas with a hydraulic conductivity greater than 0.1 cm/sec.

- 6) A filter geotextile.
- c. The side slope liner shall be comprised, in ascending order, of the following:
- 1) A prepared subgrade that meets the criteria contained in Construction Specification D.5, below.
 - 2) A GCL barrier that shall exhibit appropriate strength characteristics to accommodate stresses associated with specific landfill design parameters, with particular attention to interface, long-term creep shear, and bearing capacity.
 - 3) A 60-mil thick synthetic flexible primary membrane of HDPE.
 - 4) A geocomposite drainage layer.
 - 5) A filter geotextile.
 - 6) A two-foot thick soil operations layer.
4. The Discharger may propose changes to the liner system design prior to construction, provided that approved components are not eliminated, the engineering properties of the components are not substantially reduced, and the proposed liner system results in the protection of water quality equal to or greater than the design prescribed by Title 27 and this Order. The proposed changes may be made following approval by the Executive Officer. Substantive changes to the design require reevaluation as an engineered alternative and approval by the Board.
 5. If the Discharger proposes to construct a liner system in which a GCL is placed on top of a subgrade, the subgrade for the bottom and the side slopes of the Unit shall be prepared in an appropriate manner using accepted engineering and construction methods so as to provide a smooth surface that is free from rocks, sticks, or other debris that could damage or otherwise limit the performance of the GCL.
 6. Construction shall proceed only after all applicable construction quality assurance plans have been approved by Executive Officer.
 7. Following the completion of construction of a Unit or portion of a Unit, and prior to discharge onto the newly constructed liner system, the final documentation required in §20324(d)(1)(C) of Title 27 shall be submitted to the Executive Officer for review and approval. The report shall be certified by a registered civil engineer or a certified engineering geologist. It shall contain sufficient information and test results to verify that construction was in accordance with the design plans and specifications, and with the prescriptive standards and performance goals of Title 27.

8. A third party independent of both the Discharger and the construction contractor shall perform all of the construction quality assurance monitoring and testing during the construction of a liner system.
9. If monitoring reveals substantial or progressive increases of leachate generation above the design leachate flow volume (see Finding No. 40) by the Unit or portion of the Unit, such that the depth of fluid on any portion of the LCRS (excluding the leachate removal pump sump) exceeds 30 cm, the Discharger shall immediately notify the Board in writing within seven days. The notification shall include a timetable for remedial or corrective action necessary to achieve compliance with the leachate depth limitation.
10. Closure shall proceed only after approval of closure and postclosure maintenance plans.
11. Background monitoring points for the unsaturated zone shall be installed at a background plot having soil characteristics similar to those of the soil underlying the Unit's module(s).

E. DETECTION MONITORING SPECIFICATIONS

1. The Discharger shall submit for Executive Officer review and approval a groundwater detection-monitoring program demonstrating compliance with Title 27 for any Unit expansion.
2. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, and in accordance with Monitoring and Reporting Program No. R5-2003-0020. A detection-monitoring program for a new Unit shall be installed, operational, and one year of monitoring data collected prior to the discharge of wastes.
3. The Discharger shall provide Board staff a minimum of one week notification prior to commencing any field activities related to the installation, repair, or abandonment of monitoring devices, and a minimum 48 hour notification prior to the collection of samples associated with a detection monitoring program, evaluation monitoring program, or corrective action program.
4. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, Monitoring and Reporting Program No. R5-2003-0020, and the Standard Provisions and Reporting Requirements, dated April 2000.
5. The Water Quality Protection Standard for organic compounds which are not naturally occurring and not detected in background groundwater samples shall be taken as the detection limit of the analytical method used (i.e., US-EPA methods 8260 and 8270), but not less than 0.1 parts per billion (ppb). The repeated detection of one or more non-naturally occurring organic compounds in samples above the Water Quality Protection Standard from detection monitoring wells is evidence of a release from the Unit.

6. The concentrations of the constituents of concern in waters passing the Point of Compliance shall not exceed the concentration limits established pursuant to Monitoring and Reporting Program No. R5-2003-0020.
7. For each monitoring event, the Discharger shall determine whether the landfill is in compliance with the Water Quality Protection Standard using procedures specified in Monitoring and Reporting Program No. R5-2003-0020 and §20415(e) of Title 27.
8. For any given monitored medium, the samples taken from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be taken within a span not to exceed 30 days, unless the Executive Officer approves a longer time period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible. Specific methods of collection and analysis must be identified. Sample collection, storage, and analysis shall be performed according to the most recent version of USEPA Methods, such as the latest editions, as applicable, of: (1) Methods for the Analysis of Organics in Water and Wastewater (USEPA 600 Series), (2) Test Methods for Evaluating Solid Waste (SW-846, latest edition), and (3) Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020), and in accordance with the approved Sample Collection and Analysis Plan.
9. If methods other than USEPA-approved methods or Standard Methods are used, the exact methodology shall be submitted for review and approval by the Executive Officer prior to use.
10. The methods of analysis and the detection limits used must be appropriate for the expected concentrations. For the monitoring of any constituent or parameter that is found in concentrations which produce more than 90% non-numerical determinations (i.e., “trace” or “ND”) in data from background monitoring points for that medium, the analytical method having the lowest method detection limit (MDL) shall be selected from among those methods which would provide valid results in light of any matrix effects or interferences.
11. “Trace” results - results falling between the MDL and the practical quantitation limit (PQL) - shall be reported as such, and shall be accompanied by both the estimated MDL and PQL values for that analytical run.
12. MDLs and PQLs shall be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the lab, rather than simply being quoted from USEPA analytical method manuals. In relatively interference-free water, laboratory-derived MDLs and PQLs are expected to closely agree with published USEPA MDLs and PQLs.

13. If the laboratory suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged accordingly, along with estimates of the detection limit and quantitation limit actually achieved. The MDL shall always be calculated such that it represents the lowest achievable concentration associated with a 99% reliability of a nonzero result. The PQL shall always be calculated such that it represents the lowest constituent concentration at which a numerical value can be assigned with reasonable certainty that it represents the constituent's actual concentration in the sample. Normally, PQLs should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.
14. All QA/QC data shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and qualifications of the person(s) performing the analyses. Sample results shall be reported unadjusted for blank results or spike recoveries. In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged.
15. Unknown chromatographic peaks shall be reported, along with an estimate of the concentration of the unknown analyte. When unknown peaks are encountered, second column or second method confirmation procedures shall be performed to attempt to identify and more accurately quantify the unknown analyte.
16. The statistical method shall account for data below the practical quantitation limit (PQL) with one or more statistical procedures that are protective of human health and the environment. Any PQL validated pursuant to §20415(e)(7) of Title 27 that is used in the statistical method shall be the lowest concentration (or value) that can be reliably achieved within limits of precision and accuracy specified in the WDRs for routine laboratory operating conditions that are available to the facility. The Discharger's technical report, pursuant to §20415(e)(7) of Title 27, shall consider the PQLs listed in Appendix IX to Chapter 14 of Division 4.5 of Title 22, California Code of Regulations, for guidance when specifying limits of precision and accuracy. For any given constituent monitored at a background or downgradient monitoring point, an indication that falls between the MDL and the PQL for that constituent (hereinafter called a "trace" detection) shall be identified and used in appropriate statistical or nonstatistical tests. Nevertheless, for a statistical method that is compatible with the proportion of censored data (trace and ND indications) in the data set, the Discharger can use the laboratory's concentration estimates in the trace range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of "ties."
17. Background for water samples or soil-pore gas samples shall be represented by the data from all samples taken from applicable background monitoring points during that reporting

period (at least one sample from each background monitoring point). The Discharger may propose an alternate statistical method [to the methods listed under 27 CCR §20415(e)(8)(A-D)] in accordance with §20415(e)(8)(E) of Title 27, for review and approval by the Executive Officer.

18. The Discharger may propose an alternate statistical method [to the methods listed under 27 CCR §20415(e)(8)(A-D)] in accordance with §20415(e)(8)(E) of Title 27, for review and approval by the Executive Officer. Upon receiving written approval from the Executive Officer, alternate statistical procedures may be used for determining the significance of analytical results for common laboratory contaminants (i.e., methylene chloride, acetone, diethylhexyl phthalate, and di-n-octyl phthalate). Nevertheless, analytical results involving detection of these analytes in any background or downgradient sample shall be reported and flagged for easy reference by Board staff.

19. The Discharger shall use the following nonstatistical method for all analytes, which are not amenable to the statistical test above. The nonstatistical method shall be implemented as follows:

a. For every compliance well, regardless of the monitoring program, the discharger shall use this data analysis method, jointly, for all analytes that are detected in less than 10% of background samples. Any analyte that triggers a discrete retest per this method shall be added to the monitoring parameter list:

Triggers — From the constituent of concern or monitoring parameter list identify each analyte in the **current** sample that exceeds either its respective MDL or PQL. The discharger shall conclude that the exceedance provides a preliminary indication [or, for a retest, provide a measurably significant indication] of a release or a change in the nature or extent of the release, at that well, if *either*:

- 1) The data contains two or more analytes that are detected in less than 10% of background samples that equal or exceed their respective MDLs; or
- 2) The data contains one analyte that equals or exceeds its PQL.

b. **Discrete Retest** [27 CCR §20415(e)(8)(E)]:

- 1) In the event that the discharger concludes (pursuant to paragraph 19.a., above) that there is a preliminary indication, then the discharger shall immediately notify Regional Board staff by phone or e-mail and, within 30 days of such indication, shall collect two new (retest) samples from the indicating compliance well.
- 2) For any given compliance well retest sample, the discharger shall include, in the retest analysis, only the laboratory analytical results for those analytes indicated in

that well's original test. As soon as the retest data are available, the discharger shall apply the same test [under 19.a.], to separately analyze each of the two suites of retest data at that compliance well.

- 3) If either (or both) of the retest samples trips either (or both) of the triggers under ¶19.a., then the discharger shall conclude that there is a measurably significant increase at that well for the analyte(s) indicated in the validating retest sample(s) and shall:
 - a) **Immediately** notify the Board about the constituent verified to be present at the monitoring point, and follow up with written notification submitted by certified mail **within seven days** of validation; and
 - b) If the Discharger believes that the constituent is from a source other than the Unit, then:
 - (a) **Within seven days** of determining "measurably significant" evidence of a release, submit to the Board by certified mail a Notification of Intent to make such a demonstration pursuant to §20420(k)(7) of Title 27; and
 - (b) **Within 90 days** of determining "measurably significant" evidence of a release, submit a report to the Board that demonstrates that a source other than the Unit caused the evidence, or that the evidence resulted from error in sampling, analysis or evaluation, or from natural variation in groundwater, surface water, or the unsaturated zone.
20. If the Executive Officer determines, after reviewing the submitted report in 19.b.3.a)(b) above, that the detected constituent most likely originated from the Unit(s), the Discharger shall immediately implement the requirements of XI. Response To A Release, C. Release Has Been Verified, contained in the Standard Provisions and Reporting Requirements (April 2000).

F. EVALUATION MONITORING REQUIREMENTS

1. The Discharger shall conduct an evaluation-monitoring program used to assess the nature and extent of the release from the Unit and to design a corrective action program meeting the requirements of §20430 of Title 27. At a minimum, an evaluation monitoring program for a Unit shall include:
 - a) An assessment of the nature and extent of the release from the Unit. This assessment shall include a determination of the special distribution and concentration of each constituent of concern throughout the zone affected by the release.
 - b) For MSW landfills, the Discharger shall comply with the additional notification and monitoring system requirements incorporated by reference into State Water Resources

Control Board Resolution No. 93-62, regarding notification and monitoring relative to offsite or potential off-site migration of waste constituents.

- c) Submit an engineering feasibility study for corrective action based on the data collected to delineate the release and from the ongoing monitoring program.
 - d) For MSW landfills, the Discharger shall discuss the results of the engineering feasibility study, prior to the selection of a remedy, in a public meeting with interested and affected parties.
 - e) Submit a report of waste discharge to the Board to establish a corrective action program meeting the requirements of §20430 of Title 27 based on the data collected to delineate the release and on the engineering feasibility study.
2. The Discharger, **within 14 days** of determining “measurably significant” evidence of a release, shall notify all persons who own the land or reside on the land that directly overlies any portion of the plume of contamination if contaminants have migrated off-site if indicated by sampling of detection monitoring wells.

G. CORRECTIVE ACTION MONITORING

1. The Corrective Action Monitoring Program shall be used to assess the nature and extent of the release from the landfill and to evaluate the effectiveness of the corrective action program and the landfill cover.
2. In accordance with the Corrective Action Monitoring Program, the Discharger shall collect and analyze all data necessary to assess the effectiveness of the Corrective Action in reducing the impacts of the release on groundwater quality. A sufficient number of monitoring wells shall be installed to delineate the release.
3. The Discharger shall comply with the monitoring provisions for the Corrective Action Program (CAP) as described in Section 20430(d) of Title 27. The program shall include an annual report evaluating the ground water and unsaturated zone data of the past year(s) to demonstrate the effectiveness of the CAP.

H. LANDFILL CLOSURE REQUIREMENTS

1. The Discharger shall submit a closure and post-closure maintenance plan (or suitable modifications to a pre-existing plan) that complies with 40 CFR 258.60 and 258.61 and with Title 27 of the CCR.
2. At closure, each landfill unit shall receive a final cover consisting, at a minimum, of a two-foot thick foundation layer which may contain waste materials, overlain by a one-foot

thick clay liner, and finally by a one-foot thick vegetative soil layer, or engineered equivalent as approved by the Executive officer.

3. Vegetation shall be planted and maintained over each closed landfill unit. Vegetation shall be selected to require a minimum of irrigation and maintenance and shall have a rooting depth not in excess of the vegetative layer thickness.
4. Closed landfill units shall be graded to at least a three percent grade and maintained to prevent ponding.
5. The Discharger proposes to place waste over closed Module "I" over the life of the entire landfill as each module is expanded. The Discharger shall provide, at a minimum, a settlement and static and dynamic slope stability study of the refuse and cover/liner layers as part of the Closure and Postclosure Maintenance Plan required for Corrective Action for each module expanded against Module "I," as applicable.

I. REPORTING REQUIREMENTS

1. In the event the Discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the Discharger shall notify the appropriate Board office by telephone or email **as soon as** it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing **within two weeks**. The written notification shall state the nature, time, and cause of noncompliance, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.
2. 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 postclosure period.

Such legible records 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.
3. 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.
4. Each monitoring report shall include a compliance evaluation summary. The summary shall contain at least:
- a. For each monitoring point and background 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 (the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; the calibration of the field equipment; results of the pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water) to remove all portions of the water that was in the well bore while the sample was being taken;
 - 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 Sampling and Analysis Plan.
 - b. A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.
 - c. For each groundwater body, a description and graphical presentation of the gradient and direction of groundwater flow under/around the Unit, and the groundwater flow rate, based upon water level elevations taken prior to the collection of the water quality data submitted in the report.

- d. Laboratory statements of results of all analyses evaluating compliance with requirements.
- e. An evaluation of the effectiveness of the leachate monitoring and control facilities, and of the run-off/run-on control facilities.
- f. A summary and certification of completion of all **Standard Observations** for the Unit(s), for the perimeter of the Unit, and for the receiving waters. The Standard Observations shall include:
 - 1) For the Unit:
 - a) Evidence of ponded water at any point on the facility (show affected area on map);
 - b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
 - c) Evidence of erosion and/or of day-lighted refuse.
 - 2) Along the perimeter of the Unit:
 - a) Evidence of liquid leaving or entering the Unit, estimated size of affected area, and flow rate (show affected area on map);
 - b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
 - c) 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;
 - b) Discoloration and turbidity - description of color, source, and size of affected area;
 - c) Evidence of odors - presence or absence, characterization, source, and distance of travel from source;
 - d) Evidence of water uses - presence of water-associated wildlife;
 - e) Flow rate; and

- f) Weather conditions - wind direction and estimated velocity, total precipitation during recent days and on the day of observation.
 - g. The quantity and types of wastes discharged and the locations in the Unit where waste has been placed since submittal of the last such report.
- 5. The Discharger shall report by telephone or email any seepage from the disposal area **immediately** after it is discovered. A written report shall be filed with the 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 Constituents of Concern and Monitoring Parameters, and an estimated date that the results will be submitted to the Board; and
 - e. Corrective measures underway or proposed, and corresponding time schedule.
- 6. The Discharger shall submit an Annual Monitoring Summary Report to the Board covering the reporting period of the previous monitoring year. This report shall contain:
 - a. All monitoring parameters and constituents of concern shall be graphed so as to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous five calendar years. 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. For any given constituent or parameter, the scale for background plots shall be the same as that used to plot downgradient data. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
 - b. Unless otherwise exempted by the Executive Officer, all monitoring analytical data obtained during the previous two-six-month reporting periods, shall be submitted in tabular form as well as in a digital file format acceptable to the Executive Officer. The Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [§20420(h)], in that this facilitates periodic review by the Board.

- c. 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.
 - d. 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.
 - e. A written summary of the monitoring results, indicating any changes made or observed since the previous annual report.
 - f. An evaluation of the effectiveness of the leachate monitoring/control facilities.
7. The Discharger or persons employed by the Discharger shall comply with all notice and reporting requirements of the State Department of Water Resources with regard to the construction, alteration, destruction, or abandonment of all monitoring wells used for compliance with this Order or with MRP Order No. R5-2003-0020, as required by Section 13750 through 13755 of the California Water Code.
 8. The Discharger shall notify the Board in writing of any proposed change in ownership or responsibility for construction or operation of the landfill. The Discharger shall notify the succeeding owner or operator in writing of the existence of this Order. A copy of that notification shall be sent to the Board.
 9. The Board will review this Order periodically and will revise these requirements when necessary.

J. PROVISIONS

1. The Discharger shall maintain a copy of this Order at the facility and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.
2. The Discharger shall comply with all applicable provisions of Title 27 and 40 Code of Federal Regulations Part 258 (Subtitle D) that are not specifically referred to in this Order.
3. The Discharger shall comply with Monitoring and Reporting Program No. R5-2003-0020, which is incorporated into and made part of this Order.
4. The Discharger shall comply with the applicable portions of the Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Title 27 and/or Subtitle D (27 CCR §20005 et seq. and 40 CFR 258 et seq.), dated April 2000, which are hereby incorporated into this Order.

5. All reports and transmittal letters shall be signed by persons identified below:
 - a. For a corporation: by a principal executive officer of at least the level of senior vice-president.
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor.
 - c. For a municipality, state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.
 - d. A duly authorized representative of a person designated in a, b or c above if;
 - 1) The authorization is made in writing by a person described in a, b, or c of this provision;
 - 2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a Unit, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
 - 3) The written authorization is submitted to the Board.
 - e. Any person signing a document under this Section shall make the following certification:

“I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.”
6. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the State resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature, extent, and impact of the noncompliance.
7. The owner of the waste management facility shall have the continuing responsibility to assure protection of waters of the state from discharged wastes and from gases and leachate generated by discharged waste during the active life, closure, and postclosure maintenance period of the Unit(s) and during subsequent use of the property for other purposes.

8. The fact that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this Order shall not be regarded as a defense for the Discharger's violations of the Order.
9. To assume ownership or operation under this Order, the succeeding owner or operator must apply in writing to the Board requesting transfer of the Order within 14 days of assuming ownership or operation of this facility. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Board, and a statement. The statement shall comply with the signatory requirements contained in Provision F.5. In addition, state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer of this Order shall be approved or disapproved by the Board.
10. The Discharger shall conduct an annual review of the financial assurance for initiating and completing corrective action, and submit a report for Executive Officer review and approval. The assurances of financial responsibility shall provide that funds for corrective action shall be available to the Regional Board upon the issuance of any order under California Water Code, Division 7, Chapter 5. The Discharger shall adjust the cost annually to account for inflation and any changes in facility design, construction, or operation.
11. The Discharger shall conduct an annual review of the financial assurance for closure and postclosure maintenance, and submit a report for Executive Officer review and approval. The assurances of financial responsibility shall provide that funds for closure and postclosure maintenance shall be available to the Regional Board upon the issuance of any order under California Water Code, Division 7, Chapter 5. The Discharger shall adjust the cost annually to account for inflation and any changes in facility design, construction, or operation.

12. The Discharger shall complete the tasks contained in these waste discharge requirements in accordance with the following time schedule:

<u>Task</u>	<u>Compliance Date</u>
A. Construction Plans	
Submit construction and design plans for Executive Officer review and approval. (See Construction Specification D.1)	Prior to construction
B. Construction Report	
Submit a construction report upon completion demonstrating construction was in accordance with approved construction plans for Executive Officer review and approval. (See Construction Specification D.6)	Prior to discharge
C. Evaluation Monitoring Program	
Submit an Engineering Feasibility Report which includes closure of Module "I" (see Provision J.1.c.)	1 June 2003
D. Partial Cover	
Submit a Workplan for the design and construction of the soil cover for all modules in the Unit. Address the performance standards for precipitation and drainage controls.	1 June 2003
E. Financial Assurance Review	
1. Annual Review of Financial Assurance for initiating and completing corrective action (see Provision J.10.)	30 April each year
2. Annual Review of Financial Assurance for closure and postclosure maintenance (see Provision J.11.)	30 April each year

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2003-0020
FOR COUNTY OF SAN JOAQUIN
FOR CONSTRUCTION, OPERATION, CLOSURE AND EVALUATION MONITORING
FOOTHILL SANITARY LANDFILL, MUNICIPAL SANITARY LANDFILL
SAN JOAQUIN COUNTY

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I, THOMAS R. PINKOS, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 31 January 2003.

THOMAS R. PINKOS, Executive Officer

KAS: January 31, 2003

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2003-0020

MONITORING AND REPORTING PROGRAM
FOR
COUNTY OF SAN JOAQUIN AND FOOTHILL SANITARY LANDFILL, INC.
MUNICIPAL SOLID WASTE (CLASS III)
SAN JOAQUIN COUNTY

Compliance with this Monitoring and Reporting Program, with Title 27, California Code of Regulations, Section 20005, et seq. (hereafter Title 27), and with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Title 27 and/or Subtitle D (27 CCR §20005 et seq. and 40 CFR 258)*, dated April 2000, is ordered by Waste Discharge Requirements Order No. R5-2003-0020.

A. REQUIRED MONITORING REPORTS

<u>Report</u>	<u>Due</u>
1. Groundwater Monitoring (Section D.1)	See Table I
2. Annual Monitoring Summary Report (Order No. R5-2003-0020, F.6.)	Annually
3. Unsaturated Zone Monitoring (Section D.2)	See Table II
4. Leachate Monitoring (Section D.3)	See Table III
5. Surface Water Monitoring (Section D.4)	See Table IV
6. Facility Monitoring (Section D.5)	As necessary
7. Response to a Release (Standard Provisions and Reporting Requirements)	As necessary

B. REPORTING

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required in Order No. R5-2003-0020 and the Standard Provisions and Reporting Requirements. Reports which do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the waste discharge requirements. 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 acceptable to the Executive Officer.

Each monitoring report shall include a compliance evaluation summary as specified in F. Reporting Requirements, of Order No. R5-2003-0020.

Field and laboratory tests shall be reported in each monitoring report. Monthly, quarterly, semiannual, and annual monitoring reports shall be submitted to the Board in accordance with the following schedule for the calendar period in which samples were taken or observations made.

<u>Sampling Frequency</u>	<u>Reporting Frequency</u>	<u>Reporting Periods End</u>	<u>Report Date Due</u>
Monthly	Quarterly	Last Day of Month	by Semiannual Schedule
Quarterly	Quarterly	31 March	30 April
		30 June	31 July
		30 September	31 October
		31 December	31 January
Semiannually	Semiannually	30 June	31 July
		31 December	31 January
Annually	Annually	31 December	31 January

The Discharger shall submit an **Annual Monitoring Summary Report** to the Board covering the previous monitoring year. The annual report shall contain the information specified in F. Reporting Requirements, of Order No. R5-2003-0020, and a discussion of compliance with the waste discharge requirements and the Water Quality Protection Standard.

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

C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

1. Water Quality Protection Standard Report

For each waste management unit (Unit), the Water Quality Protection Standard shall consist of all constituents of concern, the concentration limit for each constituent of concern, the point of compliance, and all water quality monitoring points.

The Water Quality Protection Standard for naturally occurring waste constituents consists of the constituents of concern, the concentration limits, and the point of compliance and all monitoring points. The Executive Officer shall review and approve the Water Quality Protection Standard, or any modification thereto, for each monitored medium.

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 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 §20405 of Title 27.
- c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).

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.

2. Constituents of Concern

The constituents of concern include all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the Unit. The constituents of concern for all 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 constituents of concern every five years, or more frequently as required in accordance with a Corrective Action Program.

a. Monitoring Parameters

Monitoring parameters are constituents of concern that are the waste constituents,

reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a Unit. The monitoring parameters for all Units are those listed in Tables I through V for the specified monitored medium.

3. 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 §20415 of Title 27; or
- b. By an alternate statistical method acceptable to the Executive Officer in accordance with §20415 of Title 27.

The established concentration limits for naturally occurring constituents of concern are listed in **Table VII for groundwater, Table VIII for surface water, and Table IX for the unsaturated zone**. Those values that have no established Concentration Limits shall be determined (TBD) upon collection and evaluation of a minimum of 8 samples.

4. Point of Compliance

The point of compliance for the water standard at each Unit is a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the Unit.

5. Compliance Period

The compliance period for each 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 Unit. The compliance period shall begin anew each time the Discharger initiates an evaluation monitoring program.

D. 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 Detection Monitoring Specification E.2 and E.4 of Waste Discharge Requirements, Order No. R5-2003-0020. Detection monitoring for a new module shall be installed, operational, and one year of monitoring data collected **prior to** the discharge of wastes, as applicable. All monitoring shall be conducted in accordance with a Sample Collection and Analysis Plan, which includes quality assurance/quality control standards, that is acceptable to the Executive Officer.

All point of 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 as indicated and listed in Tables I through IV. One well (domestic/supply) located inside the property boundary shall be monitored concurrent with the wells of the monitoring and reporting program.

Method detection limits and practical quantitation limits shall be reported. All peaks shall be reported, including those which cannot be quantified and/or specifically identified. Metals shall be analyzed in accordance with the methods listed in Table VI.

The Discharger may, with the approval of the Executive Officer, 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.

1. Groundwater

The Discharger shall operate and maintain a groundwater detection monitoring system that complies with the applicable provisions of §20415 and §20420 of Title 27 in accordance with a Detection Monitoring Program approved by the Executive Officer. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan.

The Discharger shall determine the groundwater flow rate and direction in the uppermost aquifer and in any zones of perched water and in any additional zone of saturation monitored pursuant to this Monitoring and Reporting Program, and report the results semiannually, including the times of highest and lowest elevations of the water levels in the wells.

Hydrographs of each well shall be submitted 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.

Groundwater samples shall be collected from the point-of-compliance wells, background wells, and any additional wells added as part of the approved groundwater monitoring system. Samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table I.

The monitoring parameters shall also be evaluated each reporting period with regards to the cation/anion balance, and the results shall be graphically presented using a Stiff

diagram, a Piper graph, or a Schueller plot. Samples for the constituents of concern specified in Table I shall be collected and analyzed in accordance with the methods listed in Table VI every five years.

2. Unsaturated Zone Monitoring

The Discharger shall operate and maintain an unsaturated zone detection monitoring system that complies with the applicable provisions of §20415 and §20420 of Title 27 in accordance with a detection monitoring plan approved by the Executive Officer. 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.

Unsaturated zone samples shall be collected from the monitoring devices and background monitoring devices of the approved unsaturated zone monitoring system. The collected samples shall be analyzed for the listed constituents in accordance with the methods and frequency specified in Table II. All monitoring parameters shall be graphed to show historical trends at each monitoring point. Samples for the constituents of concern specified in Table II shall be collected and analyzed in accordance with the methods listed in Table VI every five years.

Unsaturated zone monitoring reports shall be included with the corresponding quarterly groundwater 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

All Unit leachate collection and removal system sumps shall be inspected monthly for leachate generation. Upon detection of leachate in a previously dry leachate collection and removal system, leachate shall be sampled **immediately** and analyzed for the constituents listed in Table III. Leachate shall then be sampled and analyzed annually during the fourth quarter thereafter, with a retest during the following second quarter if constituents are detected that have not been previously detected. Leachate samples shall be collected and analyzed for the listed constituents in accordance with the methods and frequency specified in Table III. The constituents of concern list shall include all constituents listed in Table VI. The quantity of leachate pumped from each sump shall be measured and reported monthly as Leachate Flow Rate (in gallons).

Leachate which seeps to the surface from the Unit shall be sampled and analyzed for the constituents listed in Table III upon detection. The quantity of leachate shall be *estimated* and reported as Leachate Flow Rate (in gallons/day).

4. Surface Water Monitoring

The Discharger shall install and operate a surface water detection monitoring system where appropriate that complies with the applicable provisions of §20415 and §20420 of Title 27 and has been approved by the Executive Officer.

For all monitoring points and background monitoring points assigned to surface water detection monitoring, samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table IV. All surface water monitoring samples shall be collected and analyzed for the constituents of concern specified in Table IV every five years. All monitoring parameters shall be graphed so as to show historical trends at each sample location.

5. Facility Monitoring

a. 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 damage to the drainage control system, groundwater monitoring equipment (including wells, etc.), and shall include the Standard Observations contained in section F.4.f. of the Standard Provisions and Reporting Requirements, August 2000. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. By **15 November** of each year, the Discharger shall submit an annual report describing the results of the inspection and the repair measures implemented, including photographs of the problem and the repairs.

b. Storm Events

The Discharger shall inspect all precipitation, diversion, and drainage facilities for damage within 7 days following major storm events. Necessary repairs shall be completed within 30 days of the inspection. The Discharger shall report any damage and subsequent repairs within 45 days of completion of the repairs, including photographs of the problem and the repairs.

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

Ordered by: _____
THOMAS R. PINKOS, Executive Officer

31 January 2003

(Date)

KAS:January 31, 2003

TABLE I
GROUNDWATER DETECTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Groundwater Elevation	Ft. & hundredths, M.S.L.	Quarterly
Temperature	°C	Semiannual
Electrical Conductivity	µmhos/cm	Semiannual
pH	pH units	Semiannual
Turbidity	Turbidity units	Semiannual
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Semiannual
Chloride	mg/L	Semiannual
Carbonate	mg/L	Semiannual
Bicarbonate	mg/L	Semiannual
Nitrate - Nitrogen	mg/L	Semiannual
Sulfate	mg/L	Semiannual
Calcium	mg/L	Semiannual
Magnesium	mg/L	Semiannual
Potassium	mg/L	Semiannual
Sodium	mg/L	Semiannual
Volatile Organic Compounds (USEPA Method 8260, see Table V)	µg/L	Semiannual
Constituents of Concern (see Table VI)		
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

TABLE II
UNSATURATED ZONE DETECTION MONITORING PROGRAM

SOIL-PORE GAS

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Monitoring Parameters		
Volatile Organic Compounds (USEPA Method TO-14)	µg/cm ³	Semiannual
Methane	%	Semiannual

SUCTION LYSIMETERS (or other vadose zone monitoring devices)

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Electrical Conductivity	µmhos/cm	Semiannual
pH	pH units	Semiannual
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Semiannual
Chloride	mg/L	Semiannual
Carbonate	mg/L	Semiannual
Bicarbonate	mg/L	Semiannual
Nitrate - Nitrogen	mg/L	Semiannual
Sulfate	mg/L	Semiannual
Calcium	mg/L	Semiannual
Magnesium	mg/L	Semiannual
Potassium	mg/L	Semiannual
Sodium	mg/L	Semiannual
Volatile Organic Compounds (USEPA Method 8260B, see Table V)	µg/L	Semiannual

Constituents of Concern (see Table VI)

Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

TABLE III
LEACHATE DETECTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Total Flow	Gallons	Monthly
Flow Rate	Gallons/Day	Monthly
Electrical Conductivity	µmhos/cm	Monthly
pH	pH units	Monthly
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Annually
Chloride	mg/L	Annually
Carbonate	mg/L	Annually
Bicarbonate	mg/L	Annually
Nitrate - Nitrogen	mg/L	Annually
Sulfate	mg/L	Annually
Calcium	mg/L	Annually
Magnesium	mg/L	Annually
Potassium	mg/L	Annually
Sodium	mg/L	Annually
Volatile Organic Compounds (USEPA Method 8260B, see Table V)	µg/L	Annually
Constituents of Concern (see Table VI)		
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

TABLE IV
SURFACE WATER DETECTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Temperature	°C	Semiannual
Electrical Conductivity	µmhos/cm	Semiannual
pH	pH units	Semiannual
Turbidity	Turbidity units	Semiannual
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Semiannual
Carbonate	mg/L	Semiannual
Bicarbonate	mg/L	Semiannual
Chloride	mg/L	Semiannual
Nitrate - Nitrogen	mg/L	Semiannual
Sulfate	mg/L	Semiannual
Calcium	mg/L	Semiannual
Magnesium	mg/L	Semiannual
Potassium	mg/L	Semiannual
Sodium	mg/L	Semiannual
Volatile Organic Compounds (USEPA Method 8260B, see Table V)	µg/L	Semiannual
Constituents of Concern (see Table VI)		
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

TABLE V
MONITORING PARAMETERS FOR DETECTION MONITORING

Surrogates for Metallic Constituents:

pH
Total Dissolved Solids
Electrical Conductivity
Chloride
Sulfate
Nitrate nitrogen

Constituents included in VOC:

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

TABLE V
MONITORING PARAMETERS FOR DETECTION MONITORING

Continued

Hexachloroethane
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 VI
CONSTITUENTS OF CONCERN & 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	9010B
Sulfide	9030B

Volatile Organic Compounds:

USEPA Method 8260

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

TABLE VI

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

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
Hexachloroethane
2-Hexanone (Methyl butyl ketone)
Isobutyl alcohol
Methacrylonitrile
Methyl bromide (Bromomethane)
Methyl chloride (Chloromethane)
Methyl ethyl ketone (MEK; 2-Butanone)
Methyl iodide (Iodomethane)
Methyl t-butyl ether
Methyl methacrylate
4-Methyl-2-pentanone (Methyl isobutyl ketone)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Naphthalene
Propionitrile (Ethyl cyanide)
Styrene
Tertiary amyl methyl ether
Tertiary butyl alcohol
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene; PCE)
Toluene
1,2,4-Trichlorobenzene
1,1,1 -Trichloroethane, Methylchloroform

TABLE VI

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

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 8270 - 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)

TABLE VI

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

p-Cresol (4-methylphenol)
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
Hexachloropropene
Indeno(1,2,3-c,d)pyrene
Isodrin
Isophorone
Isosafrole
Kepone
Methapyrilene
Methoxychlor

TABLE VI

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

3-Methylcholanthrene
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

CONSTITUENTS OF CONCERN & 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 8141A

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

TABLE VII
WATER QUALITY PROTECTION STANDARDS
FOR
GROUNDWATER

Constituent	Units	Concentration Limits
		MW-1
pH	mg/L	6.3-8.9
Total Dissolved Solids	mg/L	240
Chloride	mg/L	9.6
Carbonate	mg/L	0.808 [2]
Bicarbonate	mg/L	120
Nitrate as Nitrogen	mg/L	3.3
Calcium	mg/L	TBD
Magnesium	mg/L	TBD
Potassium	mg/L	TBD
Sulfate	mg/L	8.7
Sodium	mg/L	TBD
VOCs/SVOCs	ug/L	detect
Chlorophenoxy Herbicides	ug/L	detect
Organophosphorus Compounds	ug/L	detect
Aluminum	mg/L	0.1 [3]
Antimony	mg/L	0.0138 [2]
Arsenic	mg/L	3 [3]
Barium	mg/L	TBD
Beryllium	mg/L	TBD
Cadmium	mg/L	0.0036 [2]
Chromium, Total	mg/L	0.02 [3]
Cobalt	mg/L	TBD
Copper	mg/L	7 [3]
Cyanide	mg/L	TBD
Iron	mg/L	0.05 [3]
Lead	mg/L	0.0198 [2]
Manganese	mg/L	2.8 [3]
Mercury	mg/L	0.0002 [2]
Nickel	mg/L	0.0106 [2]
Selenium	mg/L	0.036 [2]
Silver	mg/L	0.0026 [2]
Sulfide	mg/L	0.5 [2]
Thallium	mg/L	0.024 [2]
Tin	mg/L	TBD
Vanadium	mg/L	TBD
Zinc	mg/L	6 [3]

Notes: Metals are dissolved.

[1] TBD = to be determined when enough data has been collected for non-statistical or statistical analysis.

[2] Concentration limit has been set to detection limit because 100% of the data is non-detect. The detection limit from the last monitoring event for the specific constituent is used.

[3] Concentration limit is non-parametric because 50% or more of the data is non-detect.

TABLE VIII
WATER QUALITY PROTECTION STANDARDS
FOR
SURFACE WATER

Constituent	Units	Concentration Limit
		S-1
pH	mg/L	6.0-8.2
Total Dissolved Solids	mg/L	949
Bicarbonate	mg/L	TBD
Carbonate	mg/L	TBD
Chloride	mg/L	160
Magnesium	mg/L	TBD
Nitrate as Nitrogen	mg/L	8.4
Potassium	mg/L	TBD
Sodium	mg/L	TBD
Sulfate	mg/L	140
VOCs/SVOCs	ug/L	detect
Chlorophenoxy Herbicides	ug/L	detect
Organophosphorus Compounds	ug/L	detect
Aluminum	mg/L	TBD
Antimony	mg/L	TBD
Arsenic	mg/L	TBD
Barium	mg/L	TBD
Beryllium	mg/L	TBD
Cadmium	mg/L	TBD
Chromium, Total	mg/L	TBD
Cobalt	mg/L	TBD
Copper	mg/L	TBD
Iron	mg/L	5.5
Lead	mg/L	TBD
Manganese	mg/L	4.9
Mercury	mg/L	TBD
Nickel	mg/L	TBD
Selenium	mg/L	TBD
Silver	mg/L	TBD
Sulfide	mg/L	TBD
Thallium	mg/L	TBD
Tin	mg/L	TBD
Vanadium	mg/L	TBD
Zinc	mg/L	TBD

Notes: Metals are dissolved

- [1] TBD = to be determined when enough data has been collected for non-statistical or statistical analysis.
- [2] Concentration limit has been set to detection limit because 100% of the data is non-detect. The detection limit from the last monitoring event for the specific constituent is used.
- [3] Concentration limit is non-parametric because 50% or more of the data is non-detect.

TABLE IX
WATER QUALITY PROTECTION STANDARDS
FOR
UNSATURATED ZONE

Constituent	Units	Concentration Limit* LZ-1
pH	mg/L	TBD
Total Dissolved Solids	mg/L	TBD
Bicarbonate	mg/L	TBD
Carbonate	mg/L	TBD
Chloride	mg/L	TBD
Magnesium	mg/L	TBD
Nitrate as Nitrogen	mg/L	TBD
Potassium	mg/L	TBD
Sodium	mg/L	TBD
Sulfate	mg/L	TBD
VOCs/SVOCs	ug/L	detect
Chlorophenoxy Herbicides	ug/L	detect
Organophosphorus Compounds	ug/L	detect
Aluminum	mg/L	TBD
Antimony	mg/L	TBD
Arsenic	mg/L	TBD
Barium	mg/L	TBD
Beryllium	mg/L	TBD
Cadmium	mg/L	TBD
Chromium, Total	mg/L	TBD
Cobalt	mg/L	TBD
Copper	mg/L	TBD
Iron	mg/L	TBD
Lead	mg/L	TBD
Manganese	mg/L	TBD
Mercury	mg/L	TBD
Nickel	mg/L	TBD
Selenium	mg/L	TBD
Silver	mg/L	TBD
Sulfide	mg/L	TBD
Thallium	mg/L	TBD
Tin	mg/L	TBD
Vanadium	mg/L	TBD
Zinc	mg/L	TBD

Notes: Metals are dissolved

*A minimum of 8 samples shall be used to develop background concentrations (TBD) using statistical analysis. Concentrations Limits shall be provided in the **Annual Monitoring and Reporting Program** for review by the Board.

