

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER NO. R5-2002-0145

WASTE DISCHARGE REQUIREMENTS  
FOR  
BUTTE COUNTY  
NEAL ROAD CLASS III MUNICIPAL SOLID WASTE LANDFILL  
AND  
CLASS II SURFACE IMPOUNDMENTS  
BUTTE COUNTY

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

1. Butte County (hereafter Discharger) owns a Class III municipal solid waste landfill (hereafter "landfill") and three Class II surface impoundments about 7 miles southeast of Chico, in Sections 14 and 15, T21N, R2E, Mount Diablo Baseline and Meridian, as shown in Attachment A, which is incorporated herein and made part of this Order.
2. The landfill and Class II surface impoundments (hereafter "facility") comprise 229-acres, of which 87-acres are currently designated as a disposal area for municipal solid waste. To date three landfill Waste Management Units (Unit) or Modules, as specified by Butte County, have been developed. These Units, identified as Modules 1, 2, and 3, cover approximately 66 acres of the disposal area. The remaining 21-acres of the disposal area are designated for the construction of a new landfill Unit (Module 4). Modules 1 and 3 are unlined covering approximately 49.5-acres. Module 2 was constructed with a two-foot thick compacted clay liner that is overlain by a one-foot thick granular Leachate Collection and Recovery System (LCRS) and covers approximately 16.5-acres. The Class II surface impoundments include a leachate pond, septage pond, and septage supernatant pond, as shown in Attachment B, which is incorporated herein and made part of this Order. The facility is comprised of Assessor's Parcel Number APN 040-600-082.
3. The Discharger proposes an additional expansion of the landfill disposal footprint to the west and south of the existing disposal area resulting in a total disposal footprint of approximately 140 acres (Modules 3A, and 5 through 10) as shown in Attachment B. This expansion is expected to proceed following the construction of Module 4. In addition, a Corrective Action Program has been prepared by the Discharger in response to a release from the existing active portion of the landfill. The Corrective Action Program will implement phased closure of Module 1, 2, 3 and 3A, as Module 4 is constructed.
4. On 28 October 1988 the Regional Board issued Order No. 88-190, in which the facility was classified as a Class III waste disposal site with Class II surface impoundments for the discharge of municipal solid wastes and domestic septage in accordance with the

regulations in effect when the Order was issued. This Order reclassifies the facility as a Class III landfill with Class II surface impoundments that accepts municipal solid waste and domestic septage in accordance with Title 27, California Code of Regulations, §20005, et seq. (Title 27).

5. On 17 September 1993, the Regional Board adopted Order No. 93-200, amending Order No. 88-190 and implementing State Water Resources Control Board Resolution No. 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*. Butte County and Parrott Ranch Company, Neal Road Class III Landfill and Class II Surface Impoundments are added to Order No. 93-200 in Attachment 1, Line No. 36.

### **SITE DESCRIPTION**

6. The facility is in hilly terrain along the eastern edge of the Sacramento Valley. The area is characterized by topographic plateaus separated by steep ravines and canyons. The landfill has been developed in a northeast/southwest-trending canyon eroded into a gently sloping plateau. Elevations at the site range from about 410 feet mean sea level (MSL) at the northeastern facility boundary to about 210 feet MSL at the southwestern facility boundary.
7. The facility lies on nearly flat-lying volcanic deposits of the Tuscan Formation. It is underlain by a series of interlayered sandstone, tuff-breccia, and lahar deposits. The sandstones are typically fine to coarse grained and contain up to 4-percent silt. The lahar deposits are well-cemented and frequently fractured and jointed. Fractures are usually open and approximately one-fourth inch wide. The clayey sands of the Tuscan Formation immediately underlying the facility have in-situ permeabilities ranging from  $2 \times 10^{-4}$  cm/sec to  $3 \times 10^{-3}$  cm/sec. Samples from the formation have achieved remolded permeabilities of  $1 \times 10^{-4}$  cm/sec.
8. The Tuscan Formation is an important water-bearing unit in the northeastern part of the Sacramento Valley containing the main regional aquifer. The formation is exposed in the Cascade foothills and extends to the valley floor. Beneath the facility, groundwater is found at elevations ranging from 136 feet to 146 feet MSL. This groundwater exists under unconfined conditions within the Tuscan sandstones.
9. A well-cemented lahar deposit generally occurs in the upper elevations at the facility. The subsurface materials exposed within Module 4 predominately consist of thick sandstone. Capillary rise beneath the landfill has been estimated to be less than two feet. The average measured hydraulic conductivity of the native soils underlying Module 4 is 0.001 cm/sec.
10. The Chico Monocline Fault is the closest potential seismogenic source to the facility. It is a buried reverse-slip fault, which extends for more than 70 km (43 mi) to the northwest. The Chico Monocline Fault has a long-term calculated slip rate of 0.14 to 0.33 mm/yr. The

maximum credible earthquake for the fault is estimated to be moment magnitude Mw 7.0. The peak horizontal ground acceleration in rock at the facility with a 10 percent probability of exceedence in a 250-year period is 0.44 g. The most likely source event corresponding to this level of ground shaking can be characterized by earthquake magnitudes in the range of Mw 6.0 to 6.5 occurring at a distance of about 5 km.

11. The landfill rises approximately 60-90 feet above the surrounding grade and is covered with a relatively pervious material that, in combination with the flat upper surface, allows for percolation of precipitation into the waste pile enhancing the production of leachate. Portions of the landfill are covered with interim cover tarps to assist in preventing infiltration of water into the waste pile.
12. The Butte County land use map designates the property within 1,000 feet of the landfill as "U" open grazing land (A-Z zoning designation). Currently no structures exist within 1,000 feet of the facility. The only structure within one mile of the facility is an inactive poultry ranch one-half mile south of the facility on Neal Road.
13. The facility receives an average of 26.32 inches of precipitation per year as measured at the Chico University Farm Station No. 1715 located at Latitude 39°42'00''N, Longitude 121°49'00''W at an elevation of 185 feet MSL. The mean pan evaporation rate is 66.8 inches per year as measured at the Chico Experiment Station No. 4 located at Latitude 39°42'00''N, Longitude 121°47'00''W at an elevation of 205 feet MSL.
14. The 100-year, 24-hour precipitation event is estimated at 5.28 inches, based on Department of Water Resources' bulletin entitled *Rainfall Depth-Duration-Frequency for California*, revised November 1982, updated August 1986.
15. The facility is not within a 100-year flood plain based on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, Community-Panel Number 06007C.
16. There are two industrial groundwater supply wells within one mile of the facility. One is the water supply well for the facility, and the other is located at the inactive poultry ranch one half mile southeast of the facility. Surface springs or other sources of groundwater supply have not been observed in the area.

### **SURFACE WATER AND GROUNDWATER**

17. The Regional Board adopted a *Water Quality Control Plan for the Central Valley Region, Sacramento River and San Joaquin River Basins, Fourth Edition* (hereafter Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and describes an implementation program and policies to achieve water quality objectives for

all waters of the Basin. This includes plans and policies adopted by the SWRCB and incorporated by reference, such as Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California*. These requirements implement the Basin Plan.

18. Surface drainage is toward Hamlin Slough, a tributary to Butte Creek in the Upper Little Chico Hydrologic Area (No. 521.30) of the Butte Creek Hydrologic Unit (No. 521.00), as depicted on interagency hydrologic maps prepared by the Department of Water Resources in August 1986.
19. The facility is located adjacent to Nance Canyon, which contains an unnamed intermittent stream. The stream combines with a second unnamed stream that flows out of the southwestern portion of the facility. The combined flow of these streams eventually discharges to Hamlin Slough, Butte Creek, and the Sacramento River.
20. The beneficial uses of the Sacramento River downstream of the discharge as identified in Table II-1 of the Basin Plan are municipal and domestic supply, agricultural irrigation and agricultural stock watering; industrial service supply, hydropower generation, contact recreation, canoeing and rafting, and non-contact recreation, warm and cold freshwater habitat, warm and cold water fish migration, warm and cold water fish spawning, wildlife habitat, and navigation.

The beneficial uses of Butte Creek downstream of the discharge as identified in Table II-1 of the Basin Plan are municipal and domestic supply, agricultural irrigation and agricultural stock watering, hydropower generation, contact recreation, warm and cold freshwater habitat, cold water fish migration, warm and cold water fish spawning, and wildlife habitat.

The beneficial uses of Hamlin Slough are not identified in the Basin Plan, however the Basin Plan states, "The beneficial uses of any specifically identified water body generally apply to its tributary streams." Upon review of the flow conditions, habitat values, and beneficial uses of Hamlin Slough, the Regional Board finds that the beneficial uses identified in the Basin Plan for Butte Creek are applicable to Hamlin Slough.

21. The first water-bearing horizon is approximately 100 feet below the base of the current landfill and approximately 10 feet below the base of Module 4 at 136 to 146 ft elevation above MSL. The hydraulic gradient is generally to the southwest, and groundwater flows at approximately 44 feet per year. Groundwater in the region is of excellent quality, with total dissolved solids generally less than 200 mg/L.
22. The designated beneficial uses of the groundwater, as specified in the Basin Plan, are municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply.

23. This Order implements:
- a. The Basin Plan;
  - 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.

#### **WASTE AND FACILITY CLASSIFICATION**

24. The Discharger discharges nonhazardous municipal solid wastes, as defined in §20164 of Title 27, to the Class III Landfill. Nonhazardous solid wastes include municipal solid wastes, as referred to in Title 40, Code of Federal Regulations, Part 258 (Subtitle D).
25. The Discharger also discharges wastes containing greater than one percent (>1%) friable asbestos for disposal in the Class III Landfill. These wastes are classified as 'hazardous' under Title 22 of the California Code of Regulations. However, because these wastes do not pose a threat to water quality, Section 25143.7 of the Health and Safety Code permits their disposal in any landfill which has Waste Discharge Requirements that specifically permit the discharge, provided the wastes are handled and disposed of in accordance with other applicable state and federal statutes and regulations.
26. The site characteristics where the facility is located do not meet the siting criteria for a new Class III landfill, as described in §20260(a) and (b)(1) of Title 27. As such, the facility is not suitable for operating new landfill Units or lateral expansions of existing landfill Units for the discharge and containment of Class III wastes without the construction of additional waste containment features, as described in §20260(b)(2) of Title 27 and State Water Resources Control Board Resolution No. 93-62.
27. The leachate pond and primary septage pond were retrofitted to Class II standards in 1992, following the closure of previous unlined leachate and septage ponds in the area of proposed Module 4. The septage supernatant pond was constructed in 1996 and began operation in 1997.
28. Approximately 400,000 to 500,000 gallons per month of septage from throughout Butte County is discharged into the septage pond. In 1999, 2000, and 2001, the volume of septage accepted at the facility was 5.58, 5.65, and 6.38 millions gallons respectively. Overlying liquid, including storm water, is decanted into the septage supernatant pond for evaporation. Currently, excess supernatant from the supernatant septage pond is trucked

off-site to one of the following locations, City of Chico wastewater treatment facility, City of Oroville wastewater treatment facility, or the Sewerage Commission-Oroville Region.

29. On 4 November 1999, the Discharger submitted a Report of Waste Discharge to dispose of excess supernatant from the supernatant septage pond to on-site surface soils instead of trucking the waste off-site. Separate Waste Discharge Requirements will be drafted for this proposed discharge.

### **CLASS II SURFACE IMPOUNDMENT DESIGN AND CONSTRUCTION**

30. Article 4, Table 4.1, and Sections 20330 and 20340, Title 27, contain construction standards for Class II surface impoundments. Minimum requirements include the following:
  - a. A single (replaceable) compacted clay liner with a hydraulic conductivity of  $1 \times 10^{-6}$  cm/s, or less. The liner must be replaced before the last 25 percent (minimum one-foot thickness) of liner has been penetrated by fluid waste; or
  - b. A double liner consisting of a synthetic flexible membrane primary (inner) liner (minimum thickness 40 mils) underlain by a blanket type leachate collection and removal system underlain by a minimum two-foot thick compacted clay liner having a hydraulic conductivity of  $1 \times 10^{-6}$  cm/s, or less, or a substantial thickness of natural geologic materials having a hydraulic conductivity of  $1 \times 10^{-6}$  cm/s, or less.
31. The Discharger has constructed three Class II surface impoundments for the containment of leachate, septage, and septage supernatant. The surface impoundments that contain septage are constructed (from top to bottom) with a 60-mil HDPE geomembrane, a geonet, and a 40-mil Gundseal composite liner. The surface impoundment containing leachate is lined (from top to bottom) with a 60-mil HDPE geomembrane, a ¼ inch geonet, a 40-mil HDPE geomembrane, and one foot of low permeability soil.
32. Experience has shown that the prescriptive standard described in Finding No. 30 will not meet the performance standard for a Class II surface impoundment, which is “to prevent migration of wastes from the WMUs to adjacent geologic materials, groundwater, or surface water, during disposal operations, closure, and the post closure maintenance period” (Section 20310(a), Title 27). To meet the performance standard, future Class II surface impoundments constructed and operated at this facility must, at a minimum, consist of a synthetic flexible membrane inner liner and a composite outer liner with an intervening LCRS. The composite outer liner must, at a minimum, consist of one-foot of compacted clay with a hydraulic conductivity of  $1 \times 10^{-6}$  cm/sec or less, overlain by a synthetic flexible membrane liner. Synthetic flexible membrane liner materials must have a minimum thickness of 40 mils (60 mils, if HDPE).

### LANDFILL DESIGN AND CONSTRUCTION

33. 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 Subtitle D.
34. Resolution No. 93-62 requires the construction of a prescribed 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.
35. Resolution No. 93-62 also allows the Regional 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.
36. Section 20080(b) of Title 27 allows the Regional 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 that 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.
37. Section 13360(a)(1) of the California Water Code allows the Regional 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.
38. On 26 November 2001, the Discharger submitted a Report of Waste Discharge requesting approval of an engineered alternative to liner requirements for Module 4.
39. The Discharger proposes a liner system beneath Module 4, which will be designed, constructed, and operated to prevent degradation of waters of the state as 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.
40. The engineered alternative proposed by the Discharger consists of a double composite liner on the floor and a single composite liner on the side slopes. On the landfill base the

containment system consists of the following components, from top to bottom: 12 inches of operations soil, 8-oz. non-woven geotextile filter, 12 inches of LCRS gravel (permeability greater than or equal to 1 cm/s) with LCRS piping, 60-mil HDPE geomembrane (double-sided textured), Geosynthetic Clay Liner (GCL), Geocomposite leak detection layer, 60-mil HDPE geomembrane (double-sided textured), GCL, 12 inches of low-permeability soil liner (permeability less than or equal to  $1 \times 10^{-6}$  cm/s), and native subgrade (sandstone and lahar).

41. Side slope liners are proposed to be constructed of, from top to bottom: 24 inches of operations soil, LCRS geocomposite drainage layer, 60-mil HDPE geomembrane (single-sided textured, textured side down), GCL, and native subgrade (sandstone, or lahar) with surface improvements as necessary to provide support to the overlying geosynthetic liner system. The side slopes range from 2H:1V to 1.75H:1V (horizontal:vertical).
42. 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.
43. Leachate will be drained by gravity from Module 4 to the low point of the LCRS at the western end of the proposed landfill expansion, where it will be pumped through a riser pipe and conveyed to the leachate surface impoundment for disposal. Along the floor of the landfill, the LCRS will consist of a one-foot thick layer of 3/8-inch minus gravel. A perforated 6-inch diameter HDPE pipe will be located centerline of the landfill with lateral HDPE pipe drains spaced approximately every 200 feet. Along the side slopes, the LCRS will consist of a geocomposite drainage layer. At the tie-in between Module 4 and Modules 1 and 3, a geocomposite drainage layer will be constructed at the toe of the existing refuse fill to collect lateral leachate migration from Modules 1 and 3. This leachate will be conveyed to the floor of Module 4 where it will tie into the main LCRS collection pipe. During interim landfill development, a temporary sump will be located on the western end of the initial cell (Phase A), where leachate will be pumped from a temporary riser pipe to the permanent leachate pond. A small lined, 5- to 10-foot high berm will be located along the western edge of Module 4 to provide leachate containment. The peak design leachate generation rate of 500 gallons/acre/day is estimated for the short-term development conditions.
44. Construction will proceed only after all applicable construction quality assurance plans have been approved by Executive Officer. Construction of Module 4 and closure of Modules 1, 2, 3, and 3A will proceed as described in Section 4.2.3 of the *Corrective Action Program, Neal Road Landfill, Butte County*, dated 18 March 2002. The closure schedule for Modules 1, 2, 3, and 3A is described in Provision L.13 of this Order.



### **STORM WATER MONITORING**

45. Undiverted precipitation falling on the landfill units that contacts waste is collected and handled by the leachate collection and removal system or otherwise kept on-site in accordance with Section 20365(b) of Title 27 and the *Standard Provisions and Reporting Requirements for Title 27 (27 CCR section 20005, et seq.) and Subtitle D (40 CFR 258)*, dated April 2000 (Standard Provisions).
46. Precipitation that falls on the site without contacting waste (storm water) is diverted off-site by a system of drainage structures and holding facilities. Storm water runoff, which does not contact waste, is directed to peripheral channels and discharged into an ephemeral drainage that is tributary to Hamlin Slough.
47. Discharge of storm water to a water of the United States requires a federal permit under the National Pollutant Discharge Elimination System (NPDES). The facility operates under State Water Resources Control Board (SWRCB) Order No. 97-03-DWQ (General NPDES Permit No. CAS000001) and has an approved Storm Water Pollution Prevention Plan. This Order requires the Discharger to maintain and comply with General NPDES Permit No. CAS000001.

### **UNSATURATED ZONE AND GROUNDWATER MONITORING**

48. The Discharger has installed an unsaturated zone and groundwater monitoring network, as shown on Attachment B. Unsaturated zone monitoring consists of 11 suction lysimeters. Lysimeters U1, U2, U3, and U4 are located in the active areas of the landfill. Lysimeters U1 and U2 will be abandoned to allow for the construction of Module 4. Lysimeter U5 is the designated "background" point and is located near the landfill entrance. Lysimeter U6 is located beneath the leachate collection pond. Lysimeters U7, U8, U9, U10L, and U10S are placed beneath the septage pond and/or septage supernatant pond.
49. The groundwater monitoring network consists of 10 monitoring wells. MW-4 is the designated background well. The down gradient monitoring wells include MW-1, MW-2, MW-6, MW-7, MW-8a and 8b, MW-9, and MW-10. MW-3 is located at the gate entrance to the landfill, cross gradient of the active areas. MW-5 has been decommissioned. One additional background well, MW-12, and one additional downgradient well, MW-11, are proposed for future installation.
50. The Discharger's Detection Monitoring Program for groundwater at the facility does not satisfy the requirements contained in Title 27. This Order requires the Discharger to submit a groundwater detection monitoring program for Module 4, and any other Unit expansion, and specifies additional unsaturated zone monitoring.

### **GROUNDWATER DEGRADATION**

51. Volatile organic compounds (VOCs) and soluble salts are often detected in a release from a landfill, and are the primary waste constituents detected in groundwater beneath a municipal solid waste landfill. Since VOCs 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.
52. 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.
53. The Regional 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 Regional 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.
54. 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.
55. 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 limits (MDLs), 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, if there is a source of the detected constituents other than the landfill, or if 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.
56. Groundwater and soil-pore liquid have been monitored on a quarterly basis since 1989. The analytical results indicate evidence of a release, as shown by elevated concentrations of several monitoring parameters in down gradient compliance wells when compared to

background wells. Higher concentrations in down gradient compliance wells of specific conductance, total dissolved solids, chlorides, sulfate, and nitrate, indicate a release of waste constituents from the landfill to groundwater. A statistical analysis of these constituents showed significant concentration increases compared to background levels.

### **CORRECTIVE ACTION PROGRAM**

57. The detection of waste constituents in the unsaturated zone and groundwater requires the implementation of a Corrective Action Program (CAP) to remediate the discharge pursuant to §20430 in Title 27. The initial corrective action measures implemented in the early 1990's included covering the inactive portions of the landfill with temporary tarps to help shed precipitation. A review of the ground water data showed this action was ineffective; the concentrations of the noted waste constituents increased during this time period. Reasons the original CAP failed include: lack of adequate slope on the top of the landfill to facilitate runoff, the highly permeable nature of the earthen cover material and the need to expose portions of the site during waste disposal operations, and increased difficulty in managing storm water runoff.
58. On 18 March 2002 the Discharger submitted a second CAP that includes final closure of Modules 1, 2, 3, and 3A by 2006. Closure will consist of covering these Units with a flexible membrane liner and vegetative cover to exclude all precipitation. A gas control system will be employed to remove gas and moisture created by the decomposing waste. Trend analyses of groundwater monitoring data from the down gradient compliance wells will be evaluated to determine the effectiveness of the CAP.

### **CEQA AND OTHER CONSIDERATIONS**

59. The Butte County Board of Supervisors certified the Final Environmental Impact Report for the facility on 12 February 2002. Butte County Department of Public Works filed a Notice of Determination on 15 February 2002 in accordance with the California Environmental Quality Act (Public Resources Code Section 21000 et seq.) and CEQA Guidelines (14 CCR Section 15000 et seq.). The Regional Board considered the Environmental Impact Report and incorporated mitigation measures from the Environmental Impact Report into these Waste Discharge Requirements designed to prevent potentially significant impacts to design facilities and to wastewater quality.
60. The Environmental Impact Report classified impacts to surface water and groundwater as potentially significant. Surface water quality may be potentially impacted from storm water runoff containing wastes from soil excavation and disturbances during construction activities. Proposed mitigation for these impacts includes diversion of offsite surface water runoff around the landfill and directing onsite storm water into a sedimentation basin.

Additional measures include re-contouring drainage patterns using a series of temporary and permanent drainage ditches and berms routed to a sedimentation/storm water retention basin. Groundwater quality may potentially be impacted as excavation brings disposed waste closer to the water table. Groundwater may also be affected by landfill gas migration. Proposed mitigation efforts include the installation of a low permeability liner system, a gas and leachate collection system, and tire pit monitoring as part of the evaluation monitoring program.

### **PROCEDURAL REQUIREMENTS**

61. 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 facility for the discharges of waste to land stated herein.
62. The Regional Board has considered the information in the attached Information Sheet in developing the findings in this Order. The attached Information Sheet is part of this Order.
63. The Regional 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.
64. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.
65. Any person adversely affected by this action of the Regional Board may petition the State Water Resources Control Board to review the action. The petition must be received by the State Board within 30 days of the date of issuance of this Order. Copies of the law and regulations applicable to filing the petition will be provided on request.

**IT IS HEREBY ORDERED** that Order No. 88-190 is rescinded and Attachment 1 of Order No. 93-200 is amended to delete line No. 36, Butte County and Parrott Ranch Company, Neal Road Class III Landfill and Class II Surface Impoundments, and that Butte County, Neal Road Class III Municipal Solid Waste Landfill and Class II Surface Impoundments, its agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

**A. PROHIBITIONS**

1. The discharge of 'hazardous waste' is prohibited except for the discharge of non-friable asbestos to the landfill. The discharge of 'designated waste' is prohibited except for the discharge of leachate to the designated Class II surface impoundment. 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 Section 13173 of the California Water Code.
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.
4. The discharge shall not cause the release of pollutants, or waste constituents in a manner that could cause a condition of nuisance, degradation, contamination, or pollution of groundwater to occur, as indicated by the most appropriate statistical or non-statistical 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 shall not cause any increase in the concentration 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.
7. The discharge of wastes, other than septage, to the septage pond Class II surface impoundment is prohibited.
8. The discharge of wastes, other than septage supernatant, to the septage supernatant Class II surface impoundment is prohibited.

**B. DISCHARGE SPECIFICATIONS**

1. Non-hazardous solid wastes shall be discharged to either:
  - a. The active portions of Modules 1, 2, 3, or 3A until 15 October 2006, when these unlined portions of the landfill will receive final closure; or
  - b. To Module 4, which is designed and constructed with a composite liner containment system that meets the requirements for both liners and leachate collection and removal systems described in General Construction Specifications D in this Order.
2. The discharge shall remain within the designated disposal area at all times.
3. Class II surface impoundments shall be operated and maintained to sustain a freeboard of at least two feet at all times.
4. Public contact with the septage pond and septage supernatant pond shall be precluded through fences, signs, or other means.
5. Collected screenings, sludges, and other solids removed from the septage pond and septage supernatant pond shall be disposed of in a manner that is consistent with Title 27 and approved by the Executive Officer.

**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 Regional Board of any flooding, unpermitted discharge of waste off-site, equipment failure, slope failure, or other change in facility 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 to prevent the danger of 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 shall either 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.

#### **D. GENERAL CONSTRUCTION SPECIFICATIONS**

1. The Discharger shall submit for Executive Officer review and approval **prior to** construction, design plans and specifications for new Units and expansions of existing Units, that include the following:
  - a. A Construction Quality Assurance (CQA) 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 that is demonstrated to remain effective throughout the active life, closure, and postclosure maintenance periods of the Unit shall be installed beneath the composite liner system in accordance with §20415(d) of Title 27.
2. 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 Regional Board.
3. 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.

4. Construction shall proceed only after all applicable construction quality assurance plans have been approved by Executive Officer.
5. The composite liner system shall 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.
6. 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.
7. 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.
8. If monitoring reveals substantial or progressive increases of leachate generation above the design leachate flow volume of 500 gallons/acre/day 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 Regional 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.
9. Closure of Module 4 shall not proceed in the absence of closure Waste Discharge Requirements.

**E. CLASS III LANDFILL CONSTRUCTION SPECIFICATIONS**

1. The engineered alternative for Module 4 shall be constructed as a double composite liner on the floor and a single composite liner on the side slopes. On the landfill base, the containment system consists of the following components from top to bottom: 12 inches of operations soil, 8-oz. non-woven geotextile filter, 12 inches of LCRS gravel (permeability greater than or equal to 1 cm/s) with LCRS piping, 60-mil HDPE geomembrane (double-sided textured), Geosynthetic Clay Liner (GCL), Geocomposite leak detection layer, 60-mil HDPE geomembrane (double-sided



- textured), GCL, 12 inches of low-permeability soil liner (permeability less than or equal to  $1 \times 10^{-6}$  cm/s), and native subgrade (sandstone and lahar).
2. Side slope liners shall be constructed of, from top to bottom: 24-inches of operations soil, LCRS geocomposite drainage layer, 60-mil HDPE geomembrane (single-sided textured, textured side down), GCL, and native subgrade (sandstone, or lahar) with surface improvements as necessary to provide support to the overlying geosynthetic liner system. The side slopes range from 2H:1V to 1.75H to 1V (horizontal:vertical).

#### **F. CLASS II SURFACE IMPOUNDMENT CONSTRUCTION SPECIFICATIONS**

1. Future Class II surface impoundments shall be constructed with a double liner with a blanket-type LCRS between the inner and outer liners. The inner liner shall be a synthetic flexible membrane at least 40-mil thick (60 mils, if HDPE). The outer liner, under the LCRS, shall be a composite, consisting of an upper synthetic flexible membrane at least 40-mil thick (60-mil, if HDPE), underlain by at least one foot of compacted clay having a hydraulic conductivity of  $1 \times 10^{-6}$  cm/s or less.
2. Class II surface impoundments and related containment structures shall be constructed and maintained to prevent, to the greatest extent possible, inundation, erosion, slope failure, washout, and overtopping under 1000-year, 24-hour precipitation conditions, and shall be designed to contain the 100-year wet season precipitation.
3. Class II surface impoundments and related containment structures shall be designed and constructed to withstand a maximum credible earthquake.
4. LCRSs shall be designed, constructed, and maintained to collect twice the anticipated daily volume of leachate generated by the WMU and to prevent the buildup of hydraulic head on the underlying liner. The depth of fluid in any collection sump shall be kept at or below the minimum needed to ensure efficient pump operation.
5. Fluid leaking through the inner liner of a Class II surface impoundment shall be collected and returned to the impoundment or otherwise disposed of in a manner approved by the Executive Officer. Flow through the inner liner shall be measured and expressed in units of gallons/minute/acre.

#### **G. UNSATURATED ZONE MONITORING SPECIFICATIONS**

1. The Discharger shall maintain and sample the unsaturated zone monitoring system as described in Monitoring and Reporting Program Order No. R5-2002-0145.

2. A pan lysimeter shall be installed beneath the liner system of each newly constructed Unit and surface impoundment for the purposes of unsaturated zone monitoring as approved by the Executive Officer.

#### **H. 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. R5-2002-0145. 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 [27 CCR §20415(e)(6)].
3. The Discharger shall provide Regional 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. R5-2002-0145, and the Standard Provisions and Reporting Requirements, dated April 2000.
5. The Water Quality Protection Standard for organic compounds that 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., USEPA methods 8260 and 8270). The presence of 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. R5-2002-0145.
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. R5-2002-0145 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.
9. The Discharger shall submit for Executive Officer review and approval a Sample Collection and Analysis Plan. The Sample Collection and Analysis Plan shall at a minimum include:
  - a. Sample collection procedures describing purging techniques, sampling equipment, and decontamination of sampling equipment;
  - b. Sample preservation information and shipment procedures;
  - c. Sample analytical methods and procedures;
  - d. Sample quality assurance/quality control (QA/QC) procedures; and
  - e. Chain of Custody control.
10. 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.
11. 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.
12. The **methods of analysis and the detection limits** used must be appropriate for the expected concentrations. For the monitoring of any constituent or parameter found in concentrations that 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 that would provide valid results in light of any matrix effects or interferences.
13. **“Trace” results** - results falling between the MDL and the practical quantitation limit (PQL) shall be reported as such, and shall be accompanied both by the estimated MDL and PQL values for that analytical run.

14. **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.
15. 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.
16. 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.
17. Unknown chromatographic peaks shall be reported, flagged, and tracked for potential comparison to subsequent unknown peaks that may be observed in future sampling events. Identification of unknown chromatographic peaks that recur in subsequent sampling events may be required.
18. 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 non-statistical 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".

19. 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 Regional Board staff.
20. The Discharger shall use the following non-statistical method for the Volatile Organic Compounds in water ( $VOC_{water}$ ) and Volatile Organic Compounds in soil pore gas ( $VOC_{spg}$ ) monitoring parameters and for all Constituents of Concern (COC) that are not amenable to the statistical tests above (i.e., less than 10% of the data from background samples that equal or exceed their respective MDL). Each qualifying constituent at a monitoring point shall be determined based on either:
  - a. The data from a single sample for that constituent, taken during that reporting period from that monitoring point; or
  - b. The data from the sample that contains the largest number of qualifying constituents, where several independent samples have been analyzed for that constituent at a given monitoring point.

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.

21. The method shall be implemented as follows:

- a. *For the Volatile Organic Compounds Monitoring Parameter For Water Samples [VOC<sub>water</sub>]:* For any given monitoring point, the VOC<sub>water</sub> monitoring parameter is a composite parameter addressing all “qualifying VOCs” (in this case, VOCs that are detected in less than 10% of background samples).

The Discharger shall conduct verification testing to determine whether a release of VOC<sub>water</sub> monitoring parameter has occurred if the data for any monitoring point meets either of the following triggering conditions:

1. The data contains two or more qualifying VOCs that equal or exceed their respective MDLs; or
2. The data contains one qualifying VOC that equals or exceeds its PQL.

- b. *For the Volatile Organic Compounds Monitoring Parameter For Soil Pore Gas Samples [VOC<sub>spg</sub>]:* the VOC<sub>spg</sub> Monitoring Parameter is a composite parameter for soil pore gas addressing all “qualifying VOCs” detectable using either GC or GC/MS analysis for at least a ten liter sample of soil pore gas (e.g., collected in a vacuum canister). It involves the same scope of VOCs as does the VOC<sub>water</sub> Monitoring Parameter. For the VOC<sub>spg</sub> test, “qualifying VOCs” consist of all those VOCs that are detectable in less than 10% of background soil pore gas samples.

The Discharger shall conduct verification testing to determine whether a release of VOC<sub>spg</sub> monitoring parameter has occurred if the data for any monitoring point meets either of the following triggering conditions:

1. The data contains two or more qualifying VOCs that equal or exceed their respective MDLs; or
2. The data contains one qualifying VOC that equals or exceeds its PQL.

- c. *For Constituents of Concern:* For five-yearly testing of all COCs, the “qualifying constituents” consist of COCs that are detected in less than 10% of applicable background samples.

The Discharger shall conduct verification testing to determine whether a release of COCs has occurred if the data for any monitoring point meets either of the following triggering conditions:

1. The data contains two or more qualifying constituents that equal or exceed their respective MDLs; or
  2. The data contains one qualifying constituent that equals or exceeds its PQL.
22. **Non-Statistical Method Retest.** A non-statistical test method may be used by the Discharger to analyze the monitoring data for which it is impractical to conduct a statistical analysis. A non-statistical test method shall include a procedure to verify that there is “measurably significant” evidence of a release from the Unit. For the  $VOC_{water}$ ,  $VOC_{spg}$ , and non-statistical COC test, the Discharger shall use a discrete retest consisting of two new samples from each indicating monitoring point. The Discharger shall conduct the retest for the standard non-statistical method as follows:
- a. **For  $VOC_{water}$  and  $VOC_{spg}$ .** Because the VOC composite Monitoring Parameter (for water or soil pore gas) is a single parameter that addresses an entire family of constituents likely to be present in any landfill release, **the scope of the laboratory analysis for each of the two retest samples shall include all VOCs detectable in that retest sample.** Therefore, a confirming retest, in accordance with Detection Monitoring Specification E.21.a. and b., above, for either triggering condition in either of the two retest samples, shall have validated the original indication even if the detected constituents in the confirming retest sample(s) differs from those detected in the sample which initiated the retest.
  - b. **For Constituents of Concern.** Because all COC that are jointly addressed in the non-statistical test above, remain as individual Constituents of Concern, **the scope of the laboratory analysis for the non-statistical retest of COC shall address only those constituents detected in the sample which initiated the retest.** Therefore, the list of “qualifying constituents” for use in the retest, under Detection Monitoring Specification E.21.c., shall consist of those constituents that provided the original indication at that monitoring point. If the retest meets either triggering condition in either of the two retest samples, the retest shall have validated the original indication.
23. **Response to Detection in Background of VOCs** (or any other constituent which is not naturally in the background and thus is not amenable to statistical analysis):
- a. Any time the laboratory analysis of a sample from a background monitoring point, sampled for VOCs, shows either:

1. Two or more VOCs at or above their respective MDLs; or
2. One VOC at or above its respective PQL.

Then the Discharger shall:

- a. **Immediately** notify the Regional Board by phone;
  - b. Follow up with written notification by certified mail **within seven days**;
  - c. Obtain **two** new independent VOC samples from that background monitoring point; and
  - d. Send such samples for laboratory analysis of all detectable VOCs **within thirty days**.
- b. If either or both the new samples validates the presence of VOC(s), using the above criteria, the Discharger shall:
    1. **Immediately** notify the Regional Board about the VOC(s) verified to be present at that background monitoring point, and follow up with written notification submitted by certified mail **within seven days** of validation; and
    2. If the Discharger believes that the VOC(s) in background is from a source other than the Unit, then:
      - a. **Within seven days** of determining “measurably significant” evidence of a release, submit to the Regional 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 Regional 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.
    - c. If the Executive Officer determines, after reviewing the submitted report(s), that the VOC(s) detected originated from a source other than the Unit(s), the Executive Officer shall make appropriate changes to the monitoring program.
24. If the Executive Officer determines, after reviewing the submitted report, that the detected VOC(s) most likely originated from the Unit(s), the Discharger shall



**immediately** implement the requirements of Item XI. Response To A Release, Section C. Release Has Been Verified, contained in the Standard Provisions and Reporting Requirements.

#### **I. CORRECTIVE ACTION PROGRAM**

1. The Discharger shall implement a Corrective Action Program as specified in Section 20430 of Title 27. That program shall remediate releases from the Unit and achieve compliance with the water quality protection standards that consist of background concentrations of the COC.
2. The Corrective Action Program is scheduled to occur in phases over the course of four years to allow for construction of Module 4 and use of the unlined modules during seasonal dry periods (May through November). However, the unlined modules will be used during seasonal wet periods until Module 4 is ready to receive waste. During this period, use of interim cover on the top deck and side slopes will be maximized. The cap will be constructed over the five-year period leading to complete closure of Modules 1, 2, 3, and 3A by 2006. The compliance date for closure of Module 1 and 2 is 15 October 2003. Modules 3 and 3A shall be closed by 15 October 2006.
3. Completed landfill Modules 1, 2, 3, and 3A shall be covered with a final cap to minimize water infiltration. The conceptual final cover design consists of: a minimum 1-foot thick foundation layer, which shall be placed as intermediate cover during landfill operations, a minimum 1-foot thick low permeability layer ( $1 \times 10^{-5}$  cm/sec or less), a geomembrane (40-mil HDPE), and a minimum 1-foot thick vegetative layer. The proposed design for the cap system will be submitted to the Regional Board for approval prior to installation.
4. Closure actions shall not take place without submittal and approval of detailed plans and specifications, including a Construction Quality Assurance/Construction Quality Control Plan.
5. Each newly constructed Unit shall include a landfill gas management system, consisting of gas extraction wells to convey landfill gas away from the Unit.

#### **J. 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 as described in Section 20430(d) of Title 27. The program shall include the detection monitoring requirements as well as an annual report evaluating the ground water and unsaturated data of the past year(s) in an effort to demonstrate the effectiveness of the CAP.

#### **K. 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 Regional Board office by telephone **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 any seepage from the disposal area **immediately** after it is discovered. A written report shall be filed with the Regional 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 COC and monitoring parameters, and an estimated date that the results will be submitted to the Regional Board; and
  - e. Corrective measures underway or proposed, and corresponding time schedule.
6. The Discharger shall submit an **Annual Monitoring Summary Report** to the Regional 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 Regional 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 Regional 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.

#### **L. PROVISIONS**

1. The Discharger shall comply with Monitoring and Reporting Program No. R5-2002-0145, which is incorporated into and made part of this Order.
2. 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.
3. 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.
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 Regional 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 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 Regional 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 Regional Board, and a statement. The statement shall comply with the signatory requirements contained in Provision L.5 and 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 Regional Board.
10. The Discharger shall establish cost estimates for initiating and completing corrective action for all known and reasonably foreseeable releases from the landfill, and submit these estimates to the Executive Officer for review and approval.
11. The Discharger shall obtain and maintain assurances of financial responsibility for initiating and completing corrective action for all known or reasonably foreseeable releases from the landfill in an amount approved by the Executive Officer, and shall submit the financial assurance mechanism for review and approval to the Financial Assurances Section of the California Integrated Waste Management Board.
12. The Discharger is required to maintain financial assurance mechanisms for closure and post closure maintenance costs as specified in Chapter 6 of Title 27. The Discharger is required to submit the financial assurance mechanism to the Financial Assurances Section of the California Integrated Waste Management, which determines if the mechanism meets the requirements of Chapter 6, Title 27, and if the amount of coverage is adequate.
13. 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 General Construction Specification D.1)	<b>One month prior to construction</b>



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 General Construction Specification D.6) **Prior to discharge**

C. Corrective Action

Plans and specifications for closure shall be submitted to the Regional Board one month prior to closure activities. The landfill shall be closed and the final cover completed according to the following schedule:

<u>Task</u>	<u>Compliance Date</u>
Closure of Module 1 and 2	15 October 2003
Closure of Module 3 and 3A	15 October 2006

D. Sample Collection and Analysis Plan

A Sample Collection and Analysis Plan shall be submitted to the Regional Board by **31 October 2002**. (see Detection Monitoring Specification H.9)

I, Thomas R. Pinkos, Acting 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 19 July 2002.

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THOMAS R. PINKOS, Acting Executive Officer

KB:klc:

## INFORMATION SHEET

ORDER NO. R5-2002-0145  
BUTTE COUNTY  
NEAL ROAD CLASS III MUNICIPAL SOLID WASTE LANDFILL  
AND CLASS II SURFACE IMPOUNDMENTS  
BUTTE COUNTY

The Neal Road Class III Municipal Solid Waste Landfill and Class II Surface Impoundments (hereafter "facility") is located seven miles southeast of Chico on land owned by Butte County. The facility is operated for Butte County by Neal Road Landfill Company, a division of Waste Management Inc.

The landfill operated as a burn dump from approximately 1965 to 1970 when it was converted to a landfill. The facility now serves all of Butte County and the current disposal area (Modules 1-3) is expected to reach capacity by the year 2005.

The landfill accepted 151,738 tons of waste in the year 2000, averaging 421 tons per day. Waste disposal rates in 1999 averaged 435 tons per day. The peak disposal rate is 1,200 tons per day, the maximum permitted by the Solid Waste Facility Permit. The rate increase of waste disposal is expected to be 3.3 percent per year, paralleling the projected population growth rate.

The landfill consists of existing modules 1, 2, and 3. Modules 1 and 3 were constructed without any liners. Module 2 was constructed with a two-foot thick clay liner (permeability of  $1 \times 10^{-6}$  cm/sec) that is overlain by a one-foot thick granular leachate collection and recovery system (LCRS). A perimeter LCRS was constructed around the north, east, and south sides of Modules 1 through 3. Leachate collected from Module 2 and the toe of Modules 1 and 3 is discharged to a designated Class II surface impoundment.

The three Class II surface impoundments include a leachate pond, primary septage pond, and septage supernatant pond. The primary septage pond receives approximately 400,000 to 500,000 gallons per month of septage influent via trucks from septic systems throughout Butte County. The primary septage pond and an adjacent leachate pond, were retrofitted to Class II standards in 1992, following the closure of previous unlined septage impoundments. A second pond used to contain supernatant from the primary septage pond was constructed in 1996. Excess supernatant that cannot be eliminated by evaporation is currently trucked to the City of Chico Wastewater Treatment Plant for disposal.

## **Geology and Hydrogeology**

The facility is situated in a canyon eroded into gently rolling volcanic tablelands on the eastern fringe of the Sacramento Valley. Flows of massive volcanic tuff-breccia of the Tuscan Formation form an erosion-resistant caprock at the head of the canyon and on the ridge on both sides of the canyon. Erosion has exposed the underlying deposits of sands, gravels, silts, and volcanic sediments. The sands and gravels are pervious and are considered to be part of the recharge area for the aquifers underlying the Sacramento Valley. Groundwater is 20 to 100 feet below the lowest elevation of the existing landfill and approximately 10 feet below the base of Module 4.

The site is not within the 100-year flood plain. No major surface waters are present near the site. Storm water runoff, which does not contact waste, is directed to peripheral channels and discharged into an ephemeral drainage that is tributary to Hamlin Slough, which flows into Butte Creek, a tributary of the Sacramento River.

Average rainfall at the site is approximately 27 inches. The mean annual evaporation is approximately 67 inches.

## **Revision of Waste Discharge Requirements**

Currently 66 acres of the 229-acre facility are used for the disposal of municipal solid waste (Modules 1 through 3). Expansion of the landfill is proposed to begin in 2002, utilizing 21 acres of the disposal area for the construction of a new module (Module 4). Future expansion phases (Modules 3A, and 5 through 10) are planned following construction of Module 4. The existing leachate collection pond, septage pond, and septage supernatant pond are located in areas of proposed Modules 6, 7, 9, and 10. Currently six monitoring wells (MW-1 through MW-4, MW-6, and MW-7) are also located in these areas. MW-2 is in proposed Module 5, MW-1 and MW-7 are in proposed Module 6, MW-3 is in proposed Module 8, and MW-6 is in proposed Module 10. These ponds and monitoring wells will need to be decommissioned and replaced prior to module construction.

The design of the expansion will exceed the prescriptive requirements of Title 27 and Subtitle D, and meet the performance standard for Class III landfills as described in Section 20260 (b)(1), which ensures no impairment of beneficial uses of surface water or of ground water beneath or adjacent to the landfill. A design report for the construction of Module 4 has been submitted to the Regional Board. The liners for the base of Module 4 will consist (from the bottom) of a

double composite liner on the floor and a single composite liner on the side slopes. On the landfill base, the containment system will consist of the following components from top to bottom: 12 inches of operations soil, 8-oz. non-woven geotextile filter, 12 inches of LCRS gravel (permeability greater than or equal to 1 cm/s), 60-mil HDPE geomembrane (double-sided textured), geosynthetic clay liner (GCL), geocomposite leak detection layer, 60-mil HDPE geomembrane (double-sided textured), GCL, 12 inches of low-permeability soil liner (permeability less than or equal to  $1 \times 10^{-6}$  cm/s), and native subgrade (sandstone and lahar). Side slopes with a steepness up to 1.75H to 1V will be lined with a single composite liner consisting, from top to bottom, of 24 inches of operations soil, LCRS geocomposite drainage layer, 60-mil HDPE geomembrane (single-sided textured, textured side down), GCL, and native subgrade (sandstone, or lahar) with surface improvements as necessary to provide support to the overlying geosynthetic liner system

Leachate will be drained by gravity from Module 4 to the low point of the LCRS at the western end of the proposed landfill expansion, where it will be pumped through a riser pipe and conveyed to the leachate surface impoundment for disposal. Along the floor of the landfill, the LCRS will consist of a one-foot thick layer of 3/8-inch minus gravel. A perforated 6-inch diameter HDPE pipe will be located centerline of the landfill with lateral HDPE pipe drains spaced approximately every 200 feet. Along the side slopes, the LCRS will consist of a geocomposite drainage layer. At the tie-in between Module 4 and Modules 1 and 3, a geocomposite drainage layer will be constructed at the toe of the existing refuse fill to collect lateral leachate migration from Modules 1 and 3. This leachate will be conveyed to the floor of Module 4 where it will tie into the main LCRS collection pipe.

## **Corrective Action**

The current groundwater monitoring system consists of one up gradient and nine downgradient “compliance” wells. Data from the ground water monitoring system shows groundwater has been impacted by waste constituents including elevated concentrations of chloride, nitrates, total dissolved solids, and specific conductance. VOCs have been detected in the unsaturated zones since 1993. Water samples from monitoring well MW-9 exceed the secondary MCL for specific conductance (900  $\mu$ mhos/cm) and total dissolved solids (500 mg/L). Water quality analyses show an increasing trend of these constituents in MW-3.

The extent of the pollution has been determined through an Evaluation Monitoring Program. The initial Corrective Action Plan (CAP) implemented in the early 1990’s entailed covering the inactive portions of the landfill with temporary tarps to help shed precipitation. A review of the ground water data showed this action was ineffective, the concentrations of the noted waste constituents increased during this time period. Reasons the original CAP failed include: lack of adequate slope on the top of the landfill to facilitate runoff, the highly permeable nature of the

earthen cover material and the need to expose portions of the site during waste disposal operations, and increased difficulty in managing storm water runoff.

The County submitted a second CAP on 18 March 2002. This plan calls for final closure of Modules 1, 2, 3, and 3A by 2006. Closure will consist of covering the Modules with a flexible membrane liner and vegetative cover to exclude all precipitation. A gas control system will be employed to remove gas and moisture created by the decomposing waste.

KB:klc

19 July 2002

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2002-0145

BUTTE COUNTY  
NEAL ROAD CLASS III MUNICIPAL SOLID WASTE LANDFILL  
AND  
CLASS II SURFACE IMPOUNDMENTS  
BUTTE 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 (WDR) Order No. R5-2002-0145.

## A. REQUIRED MONITORING REPORTS

	<u>REPORT</u>	<u>DUE</u>
1.	Annual Monitoring and Corrective Action Summary Report (WDR Order No. R5-2002-0145, Reporting Requirement K.6)	<b>Annually</b>
2.	Groundwater Monitoring (M&R Program No. R5-2002-0145, Section D.1)	<b>See Table I</b>
3.	Unsaturated Zone Monitoring (M&R Program No. R5-2002-0145, Section D.2)	<b>See Table II</b>
4.	Leachate Monitoring (M&R Program No. R5-2002-0145, Section D.3)	<b>See Table III</b>
5.	Surface Water Monitoring (M&R Program No. R5-2002-0145, Section D.4)	<b>See Table IV</b>
6.	Facility Monitoring (M&R Program No. R5-2002-0145, Section D.5)	<b>As necessary</b>
7.	Response to a Release	<b>As necessary</b>

(Standard Provisions and Reporting Requirements, Section XI)

## B. REPORTING

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program, in WDR Order No. R5-2002-0145 and in 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 WDR Order No. R5-2002-0145, Reporting Requirement K.4.

Field and laboratory tests shall be reported in each monitoring report. Monthly, quarterly, semiannual, and annual monitoring reports shall be submitted to the Regional 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	<b>by Semiannual Schedule</b>
Quarterly	Quarterly	31 March	<b>30 April</b>
		30 June	<b>31 July</b>
		30 September	<b>31 October</b>
		31 December	<b>31 January</b>
Semiannually	Semiannually	30 June	<b>31 July</b>
		31 December	<b>31 January</b>
Annually	Annually	31 December	<b>31 January</b>

The Discharger shall submit an **Annual Monitoring Summary Report** to the Regional Board covering the previous monitoring year. The annual report shall contain the

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information specified in WDR Order No. R5-2002-0145, Reporting Requirement K.6, and a discussion of compliance with the Waste Discharge Requirements and the Water Quality Protection Standard.

The results of **all monitoring** conducted at the facility shall reported to the Regional 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 COC, 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 COC, 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 facility, the Discharger may request modification of the Water Quality Protection Standard.

### **2. Constituents of Concern**

The COC 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 COC 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 COC every five years, or more frequently as required in accordance with a Corrective Action Program.

**a. Monitoring Parameters**

Monitoring parameters are COC 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 VI.}*

**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 and Corrective Action Monitoring Provisions of Title 27 for groundwater, surface water, and the unsaturated zone, in accordance with Detection Monitoring Specifications and Corrective Action Monitoring Specifications of Waste Discharge Requirements, Order No. R5-2002-0145. 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 and evaluation monitoring program groundwater monitoring wells, unsaturated zone monitoring devices, leachate, and surface water monitoring points shall be sampled and analyzed for monitoring parameters and COC as indicated and listed in Tables I through IV.

Method detection limits and practical quantitation limits shall be reported. All peaks shall be reported, including those that 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 and groundwater evaluation monitoring program 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 elevations of groundwater with respect to 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 groundwater monitoring network currently consists of “background” monitoring well MW-4 and MW-12, and downgradient monitoring wells MW-1, MW-2, MW-6, MW-7, MW-8a and 8b, MW-9, MW-10, and MW-11. MW-3 is located at the gate entrance to the landfill, cross gradient of the active areas and MW-5 has been decommissioned. Monitoring well locations are shown on Attachment B. The existing monitoring wells are located in the new expansion area with the exception of MW-4 and MW-12. The decommissioning of these wells and the construction of five additional monitoring wells is proposed in the expanded Evaluation Monitoring Program. Four of the new wells will be located downgradient from the landfill site.

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 Schoeller plot. Samples for the COC 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 Evaluation Monitoring System and 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 so as to show historical trends at each monitoring point. Samples for the COC specified in Table II shall be collected and analyzed in accordance with the methods listed in Table VI every five years.

Monitoring of the unsaturated zone consists of a network of 11 suction lysimeters shown on Attachment B. Lysimeters U1, U2, U3, and U4 are located in the active areas of the landfill. Lysimeters U1 and U2 will be abandoned to allow for the construction of Module 4. U5 is the designated “background” point and is located near the landfill entrance. U6 is located beneath the leachate collection pond. Lysimeters U7, U8, U9, U10L, and U10S are placed beneath the septage pond and/or septage supernatant pond.

Unsaturated zone monitoring reports shall be included with the corresponding semiannual groundwater monitoring 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 leachate collection and removal system sumps shall be inspected weekly 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 COC 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 that 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 COC 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 WDR Order No. R5-2002-0145, Reporting Requirement K.4.f. 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 Order.

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

19 July 2002

\_\_\_\_\_  
(Date)

KB/klc:

TABLE I  
**GROUNDWATER DETECTION & CORRECTIVE ACTION MONITORING PROGRAM**

<u>PARAMETER</u>	<u>UNITS</u>	<u>FREQUENCY</u>
<b>Field Parameters</b>		
Groundwater Elevation	Ft. & hundredths, M.S.L.	Quarterly
Temperature	°C	Quarterly
Electrical Conductivity	µmhos/cm	Quarterly
pH	pH units	Quarterly
Turbidity	Turbidity units	Quarterly
<b>Monitoring Parameters</b>		
Total Dissolved Solids (TDS)	mg/L	Quarterly
Chloride	mg/L	Quarterly
Carbonate	mg/L	Quarterly
Bicarbonate	mg/L	Quarterly
Nitrate - Nitrogen	mg/L	Quarterly
Sulfate	mg/L	Quarterly
Calcium	mg/L	Quarterly
Magnesium	mg/L	Quarterly
Potassium	mg/L	Quarterly
Sodium	mg/L	Quarterly
Volatile Organic Compounds (USEPA Method 8260, see Table V)	µg/L	Semiannual
<b>Constituents of Concern (see Table VI)</b>		
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>
<b>Monitoring Parameters</b>		
Volatile Organic Compounds (USEPA Method TO-14)	µg/cm <sup>3</sup>	Semiannual
Methane	%	Semiannual

**PAN LYSIMETERS (or other vadose zone monitoring device)**

<u>PARAMETER</u>	<u>UNITS</u>	<u>FREQUENCY</u>
<b>Field Parameters</b>		
Electrical Conductivity	µmhos/cm	Semiannual
pH	pH units	Semiannual
<b>Monitoring Parameters</b>		
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	µg/L	5 years



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(USEPA Method 8270C) Chlorophenoxy Herbicides	µg/L	5 years
(USEPA Method 8151A) Organophosphorus Compounds	µg/L	5 years

**TABLE III**

**LEACHATE DETECTION MONITORING PROGRAM**

<u>PARAMETER</u>	<u>UNITS</u>	<u>FREQUENCY</u>
<b>Field Parameters</b>		
Total Flow	Gallons	Monthly
Flow Rate	Gallons/Day	Monthly
Electrical Conductivity	µmhos/cm	Monthly
pH	pH units	Monthly
<b>Monitoring Parameters</b>		
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
<b>Constituents of Concern (see Table VI)</b>		
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>
<b>Field Parameters</b>		
Temperature	°C	Semiannual
Electrical Conductivity	µmhos/cm	Semiannual
pH	pH units	Semiannual
Turbidity	Turbidity units	Semiannual
<b>Monitoring Parameters</b>		
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
<b>Constituents of Concern (see Table VI)</b>		
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	cis- 1,3-Dichloropropene
Acrylonitrile	trans- 1,3-Dichloropropene
Benzene	Di-isopropylether (DIPE)
Bromochloromethane	Ethanol
Bromodichloromethane	Ethyltertiary butyl ether
Bromoform (Tribromomethane)	Ethylbenzene
Carbon disulfide	2-Hexanone (Methyl butyl ketone)
Carbon tetrachloride	Hexachlorobutadiene
Chlorobenzene	Hexachloroethane
Chloroethane (Ethyl chloride)	Methyl bromide (Bromomethane)
Chloroform (Trichloromethane)	Methyl chloride (Chloromethane)
Dibromochloromethane	Methylene bromide (Dibromomethane)
(Chlorodibromomethane)	Methylene chloride (Dichloromethane)
1,2-Dibromo-3-chloropropane (DBCP)	Methyl ethyl ketone (MEK: 2-Butanone)
1,2-Dibromoethane (Ethylene dibromide; EDB)	Methyl iodide (Iodomethane)
o-Dichlorobenzene (1,2-Dichlorobenzene)	Methyl t-butyl ether
m-Dichlorobenzene (1,3-Dichlorobenzene)	4-Methyl-2-pentanone (Methyl isobutylketone)
p-Dichlorobenzene (1,4-Dichlorobenzene)	Naphthalene
trans- 1,4-Dichloro-2-butene	Styrene
Dichlorodifluoromethane (CFC-12)	Tertiary amyl methyl ether
1,1-Dichloroethane (Ethylidene chloride)	Tertiary butyl alcohol
1,2-Dichloroethane (Ethylene dichloride)	1,1,1,2-Tetrachloroethane
1,1 -Dichloroethylene (1,1 -Dichloroethene; Vinylidene chloride)	1,1,2,2-Tetrachloroethane
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)	Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene)	Toluene
1,2-Dichloropropane (Propylene dichloride)	1,2,4-Trichlorobenzene
	1,1,1-Trichloroethane (Methylchloroform)
	1,1,2-Trichloroethane
	Trichloroethylene (Trichloroethene)

**BUTTE COUNTY****NEAL ROAD CLASS III MUNICIPAL SOLID WASTE LANDFILL****AND CLASS II SURFACE IMPOUNDMENTS****BUTTE COUNTY**

Trichlorofluoromethane (CFC- 11)  
 1,2,3-Trichloropropane  
 Vinyl acetate

Vinyl chloride  
 Xylenes

**TABLE VI****CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS**

<b><u>Inorganics (dissolved):</u></b>	<b><u>USEPA Method</u></b>
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)

**TABLE VI (Continued)**

**CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS**

Chloroform (Trichloromethane)  
Chloroprene  
Dibromochloromethane (Chlorodibromomethane)  
  
1,2-Dibromo-3-chloropropane (DBCP)  
1,2-Dibromoethane (Ethylene dibromide; EDB)  
o-Dichlorobenzene (1,2-Dichlorobenzene)  
m-Dichlorobenzene (1,3-Dichlorobenzene)  
p-Dichlorobenzene (1,4-Dichlorobenzene)  
trans- 1,4-Dichloro-2-butene  
Dichlorodifluoromethane (CFC 12)  
1,1 -Dichloroethane (Ethylidene chloride)  
1,2-Dichloroethane (Ethylene dichloride)  
1,1 -Dichloroethylene (1, 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

**TABLE VI (Continued)**

**CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS**

Tertiary butyl alcohol  
1,1,1,2-Tetrachloroethane  
1,1,2,2-Tetrachloroethane  
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene; PCE)  
Toluene  
1,2,4-Trichlorobenzene  
1,1,1 -Trichloroethane, Methylchloroform  
1,1,2-Trichloroethane  
Trichloroethylene (Trichloroethene; TCE)  
Trichlorofluoromethane (CFC- 11)  
1,2,3-Trichloropropane  
Vinyl acetate  
Vinyl chloride (Chloroethene)  
Xylene (total)

**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

**TABLE VI (Continued)**

**CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS**

2-Chlorophenol  
4-Chlorophenyl phenyl ether  
Chrysene  
o-Cresol (2-methylphenol)  
m-Cresol (3-methylphenol)  
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

**TABLE VI**

**CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS**

Isophorone  
Isosafrole  
Kepone  
Methapyrilene  
Methoxychlor  
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  
O,O,O-Triethyl phosphorothioate



sym-Trinitrobenzene

**TABLE VI (Continued)**

**CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS**

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