

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2004-0104

WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF ROSEVILLE
ROSEVILLE LANDFILL
CLASS III LANDFILLS
POST-CLOSURE MAINTENANCE AND CORRECTIVE ACTION
PLACER COUNTY

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

1. The City of Roseville (hereafter referred to as “Discharger”) owns and operates the Roseville Landfill, a closed, unlined Class III landfill at Berry Street and Galleria Boulevard in the City of Roseville about one mile northeast of the city center, as shown in Attachment A, which is incorporated herein and made part of this Order. The 93 acre site is in the northwest $\frac{1}{4}$ of Section 36, T11N, R6E Mount Diablo Base and Meridian (MDB&M), corresponding to Assessor Parcel Number (APN) 015-011-014 and a portion of APN 015-011-012, as shown in Attachments A and B, which are incorporated herein and made part of this Order.
2. The facility consists of three closed, unlined landfills on the eastern side of the site, including, from south to north, Area B (4 acres), Area C (7 acres), and Area D (9 acres), and associated landfill access roads and facilities, as shown in Attachment B. The facility also includes a 2-acre clean-closed landfill area (Area A) in the southwest part of the site and a 1-acre portion of the old City burn dump in the northwest part of the site. The remainder of the site is undeveloped acreage north of the landfills. Excluded from the site is a 32-acre parcel (APN 015-011-013) owned by Pacific Gas and Electric (including 8 acres of the burn dump and two electrical power substations) and the portion of parcel APN 015-011-012 covered by Galleria Boulevard.
3. The facility operated from 1967 through 1979, accepting primarily nonhazardous household, construction and commercial wastes from the City of Roseville area. Most of Area A landfill was clean-closed in the mid-1980s and consolidated into the Area B landfill. Residual wastes from Area A were subsequently removed and consolidated into Areas B, C and D during closure of those units in 1995. Areas C and D were closed as a single closure unit referred to hereafter as “Area C/D”.
4. The burn dump operated from the 1940s to the mid-1960s. About half of the burn dump area was covered by construction of Galleria Boulevard and most of the remainder (about 8 acres) was conveyed to Pacific Gas and Electric (PG&E). The Discharger retained

ownership to a narrow 1-acre strip of land between Galleria Boulevard and the PG&E parcel.

5. The landfill was previously regulated under Waste Discharge Requirements (WDRs) Order No. 94-015. These revised WDRs describe prescribe updated requirements for post-closure maintenance and corrective action for the closed landfill.
6. Effective 18 July 1997, the water quality regulations for Class II and Class III disposal facilities formerly contained in Chapter 15, Title 23, California Code of Regulations (CCR), and the solid waste regulations formerly in Title 14, CCR, were consolidated into Chapters 1 through 7, Subdivision 1, Division 2, Title 27, CCR (Title 27). These WDRs reference Title 27 regulations.
7. The Roseville landfill is not subject to federal municipal solid waste landfill regulations (Title 40, Code of Federal Regulations, Part 258, or "Subtitle D") because it ceased accepting wastes before the effective date of those regulations, 9 October 1991.

WASTES AND UNIT CLASSIFICATION

8. Areas A through D accepted wastes defined as "nonhazardous" and "inert" under Sections 20220 and 20230 of Title 27, respectively. In 1994, the Regional Board adopted revised WDRs that reclassified the facility as a Class III landfill under Chapter 15. Areas B, C and D are existing, inactive reclassified Class III waste management units under Section 20080(d) and 20080(g) of Title 27, since they both operated and stopped accepting wastes prior to 27 November 1984.
9. Areas A and B accepted primarily construction debris and street sweeping wastes, including green waste, brush and wood debris. It is estimated that up to 25,000 tons of waste (including waste from Area A after it was clean-closed) was discharged to Area B. Area C/D accepted municipal solid waste (MSW) including household refuse. Ash (up to 160,000 cubic yards) and other residual solid wastes from burn dump operations were discharged to the burn dump.

SITE DESCRIPTION

10. The land surrounding the site is characterized by rolling topography and rounded knolls and ridges separated by intermittent streams. The site is in the Antelope Creek Valley.
11. Surrounding land uses include transportation corridors, commercial, residential and industrial development. The transportation corridors include Galleria Boulevard, Berry Street, the Roseville Parkway overpass, Southern Pacific Railroad tracks, and the Interstate 80 freeway, as shown in Attachment B. Commercial uses include restaurants, shopping, gasoline service stations, and a family entertainment center. The closest residential use is an apartment complex about one-quarter mile from the site. Industrial uses in the area

include adjacent electrical power substations, a transfer station and the Berry Street Landfill.

12. Portions of the landfill side slopes lie within the 100-year floodplain. The slopes in these areas have been fortified with riprap to protect against washout, as described in Finding 32 herein.
13. The site receives an average of 22.5 inches per year of precipitation as determined from Rainfall Depth Duration Frequency data provided by the State Department of Water Resources for the Roseville Filter Plant Station. The 100-year, 24-hour precipitation event for this station is 5.0 inches.
14. Surface drainage is to Antelope Creek, which meanders from northeast to southwest through the site, flowing along the west side of Area C/D, between Area C/D and B, and then along the east side of Area B. Downstream of the site it joins Dry Creek, tributary to the Natomas East Main Drain, and the Sacramento River.
15. Beneficial uses of surface water include municipal and domestic supply, agricultural and industrial supply, recreation, ground water recharge, aesthetic enjoyment, fresh water replenishment, and preservation and enhancement of fish, wildlife, and other aquatic resources.
16. Three domestic water wells are known to exist within a one-mile radius northeast and southeast of the site. There is also an irrigation well slightly beyond one mile west of the site, and two municipal wells slightly beyond one mile southwest of the site.
17. The beneficial uses of the ground water are domestic, municipal, agricultural, and industrial supply.

WASTE MANAGEMENT UNIT DESIGN

18. The landfills at the site are unlined and do not have a leachate collection system (LCRS).
19. Area B was constructed on natural grade without any prior excavation and enclosed with earthen berms on the north, east and south sides. The berms were about 15 feet wide at the crest with exterior slopes of 2H:1V, except at the NE corner where the side slope was 1.5H:1V. The berms were subsequently mined out for foundation layer soil during closure construction in 1995. The minimum elevation of waste is about 155 feet MSL along the longitudinal axis of the unit.
20. Areas C and D were constructed by excavating to about 18 feet below natural grade and using the excavated soil to construct berms for MSW disposal cells. The cells had

generally the same dimensions as those constructed at Area B and were oriented north-south in Area C and east-west in Area D. The minimum elevation of waste is about 155 feet MSL at the center of the cells.

GEOLOGY

21. The site is on a dissected alluvial plain which is transitional between the Sacramento Valley and exposed bedrock of the Sierra Foothills. Antelope Creek Valley is filled with unconsolidated sands, gravels, silts, and clays of the Pleistocene Turlock Lake and Riverbank formations, and recent (Holocene) alluvium. Local bedrock includes Tertiary Mehrten and underlying Valley Springs formations consisting largely of volcanoclastic sediments. The Mehrten is exposed in the uplands that bound the Antelope Creek Valley. The Valley Springs Formation is not exposed near the site, but is inferred from lithologic borehole logs.
22. Landfill Areas B, C and D are directly underlain by about 40 feet of alluvial deposits of the Riverbank Formation consisting of unconsolidated sand, gravel, and silt with minor clay. The Burn Dump area and former Area A are directly underlain by the Mehrten Formation which consists of interbedded tuff breccia and andesitic sand. The Mehrten Formation has a maximum thickness of 200 feet at the site.
23. The closest known active fault in the vicinity of the site is the Cleveland Hill fault in Butte County near the City of Oroville. This fault exhibited surface fault rupture in 1975, associated with a magnitude 5.7 earthquake. This is considered to be the maximum probable earthquake for this site.

GROUNDWATER

24. The uppermost aquifer occurs in Riverbank Formation on the southeast (upgradient) side of the site and in Valley Springs bedrock on the northwest (down gradient) side of the site. Groundwater elevation monitoring data indicates that both areas are likely in hydraulic communication.
25. The depth to groundwater ranges from about 10 to 20 feet site-wide. Shallow groundwater generally flows to the west-northwest with seasonal gradients ranging from about 0.40 ft/ft in the wet season to 0.036 ft/ft in the dry season. Groundwater elevations range from about 160 feet above Mean Sea Level (MSL) along the eastern side of the landfill to about 90 feet MSL along the northeast site perimeter. Historical groundwater elevation data indicates minimal seasonal variation (i.e. less than two feet).
26. There are currently 14 monitoring wells at the site (MWs-1, 2, 3, 5, 6, 7a, 8, 9, 10A, 10B, and 11 through 14), including four wells down gradient of Area C/D (MWs-5, 8, 13 and 14) and one well down gradient of the onsite portion of the burn dump area (MW-7). The remaining wells are either upgradient or side gradient of the units. There is currently no

point of compliance or other monitoring well directly down gradient of Area B.

27. A 1988 Solid Waste Assessment Test (SWAT) investigation found volatile organic compounds (VOCs) and elevated concentrations of inorganic constituents, including general minerals and certain dissolved metals, in the groundwater at the site. Subsequent evaluation monitoring showed chloroethane up to 110 µg/L, chloroform up to 17 µg/L, dichlorodifluoromethane up to 92 µg/L, tetrachloroethylene up to 24 µg/L, trichloroethylene up to 10 µg/L, trichlorofluoromethane up to 24 µg/L, vinyl chloride up to 99 µg/L and other chlorinated VOCs.

Corrective Action Plan

28. To address the release to groundwater, previous WDR Order No. 94-015 required that the Discharger submit a preliminary engineering feasibility study (EFS) and corrective action plan (CAP). The Discharger subsequently submitted a 2 May 1994 *Preliminary Engineering Feasibility and Corrective Action Report, Roseville Sanitary Landfill*, prepared by CH2MHILL (EFS/CAP). The EFS/CAP evaluated the following corrective action options:

- a. Closure with a Low Permeability Cover ($k < 1 \times 10^{-6}$ cm/sec)
The Hydrologic Evaluation of Landfill Performance (HELP) model was used to estimate existing and post-closure leachate generation rates and an analytical solute transport model (MYGRT) to predict post-closure VOC concentrations. The HELP model indicated that construction of a low permeability cover over the landfill could reduce leachate generation rates by 60 to 75 percent. The transport model indicated that both peak VOC concentrations and the time to reach peak VOC concentrations should be significantly reduced after implementation of closure as a source control measure.
- b. Groundwater Extraction and Treatment
The EFS/CAP also evaluated groundwater extraction and treatment as a remedial alternative but concluded that it may not be effective given the complexity of the hydrogeology at the site and the fact that landfill closure, already required under the WDRs, should significantly reduce future VOC impacts.

The EFS/CAP proposed landfill closure as the preferred corrective action. The landfill was closed in accordance with the FCP as described in Finding 29 through 35 herein.

LANDFILL CLOSURE

29. In response to previous WDRs and as a follow-up to the EFS/CAP, the Discharger submitted a July 1994 *Final Closure Plan and Post-Closure Maintenance Plan* prepared by

CH2MHILL. The final closure plan (FCP) proposed the installation of a low hydraulic conductivity (LHC) cover meeting the prescriptive requirements of Chapter 15 (now Title 27) over the units, including a single contiguous cover over Areas C and D (also referred to as Area C/D). The cover components included:

- a. A foundation layer – two feet of compacted soil/fill materials
- b. An LHC layer – one foot of compacted clay ($k \leq 1 \times 10^{-6}$ cm/sec)
- c. An erosion resistant layer – one foot of clean vegetative cover soil and native grass mix for vegetative cover

30. The landfill was closed in December 1995 in accordance with the FCP. Most of the foundation layer material for Areas B and C/D was obtained by excavating existing interim cover soil and the earthen berms around both units. A total of about 60,500 cubic yards of soil, gravel and refuse materials were used in the foundation layer construction and compacted to between 85 to 90 percent. Deep dynamic compaction was used to compact landfill materials in the corridor area for future Roseville Parkway construction. About 30,350 cubic yards of imported clay was used in the LHC layer and compacted to an average field permeability of about 1.4×10^{-7} cm/sec, based on laboratory analysis of samples correlated with test pad results.
31. With the exception of the west slope, which was graded to 6H:1V, Area B was graded with 3H:1V side slopes. The crest was about 230 feet long, oriented northeast-southwest and graded to an elevation of about 192 feet MSL. The crest area drainage slopes were graded to a minimum slope of 5 percent. Area C/D was also graded with 3H:1V side slopes and 5 percent minimum crest area slopes. The crest, located near the northern end of the unit, was graded at an elevation of about 205 feet MSL. The maximum depth of waste at Areas B and C/D, including reconsolidated waste from Area A and closure-related slope reconstruction activities, was about 33 feet and 42 feet, respectively.
32. Riprap was placed at three locations along the base of the landfill side slopes (i.e. northern slope of Area B and eastern and northeastern side slopes of Area C/D) to protect against erosion from high (i.e. 100-year) creek flows (see Attachment B).
33. The portion of the burn dump owned by the Discharger, between Galleria Boulevard and the PG&E-owned portion, was also closed in accordance with the FCP. The area was smoothed, compacted and graded for drainage to the street, and then covered with one foot of vegetative cover soil and seeded to establish vegetative cover.

Precipitation and Drainage Controls

34. Precipitation and drainage facilities designed to convey site runoff from a 100-year 24-hour storm event were installed at the site as part of landfill closure. The precipitation and drainage facilities at the site include a concrete-lined ditch along the north and northeastern

perimeter of Area C/D, an unlined V-ditch along the southeastern perimeter of Area C/D, and two unlined V-ditches along the western perimeter of Area B, all discharging to Antelope Creek at the locations shown in Attachment B. Runoff from the landfills enters these drains by sheet flow.

Landfill Gas

35. Methane concentrations up to 55 percent by volume have been historically detected in landfill gas (LFG) probes along the south and southeastern perimeters of Area C/D. VOCs detected in groundwater have also been historically detected in the LFG. To address the perimeter methane exceedances, the Discharger installed passive LFG controls as part of landfill closure in 1995. The system included a collection system consisting of a network of 4-inch diameter perforated HDPE collection pipes placed in gravel-filled trenches (3 feet deep and 2 feet wide) in waste immediately below the final cover. One trench was installed along the length of the landfill crest and 6 shorter trenches were installed perpendicular to the landfill side slopes. Vents consisting of HDPE riser pipes housed in steel pipe were placed along the crest and connected to the trench system piping. Four vents were installed in Area C/D (six on the northeast side of the parkway and one on the southwest side of the parkway) and two in Area B. Six LFG monitoring wells (LFG-1 through 6) with two probes in each well were also installed in perimeter areas around the landfills.

POST-CLOSURE

Monitoring

36. Since 1995, five vents (VRs-8 through 11), five additional LFG monitoring wells (LFG-7 through 11), and several gas monitoring probes have been installed along the eastern site perimeter for methane monitoring/control, as shown in Attachment C. VRs-9, 10, and 11 were installed in 2003 along the eastern perimeter drain. No methane exceedances have been detected along the landfill perimeter since installation of these vents.
37. The concentrations of VOCs detected in Area B and C/D monitoring wells at the site have declined significantly since landfill closure and the initiation of landfill gas venting in 1995. In compliance well MW-5 down gradient of Area C/D, for example, the maximum concentration of vinyl chloride declined from 99 µg/L to 13 µg/L. Nearby well MW-8 currently has the highest concentrations of VOCs, some of which exceed applicable water quality limits and/or drinking water standards, as follows (exceedances in bold):

VOC	MW-8	Concentration (µg/L) ¹	
		California MCL	California Public Health Goal
Benzene	0.6	1	0.15
Chlorobenzene	6.4	70	200
Chloroethane	6.0	---	---
1,4-Dichlorobenzene	6.6	5	6
1,2-Dichlorobenzene	1.7	600	600
1,1-Dichloroethane	0.8	5	3
1,2-Dichloroethane	1.2	0.5	0.4
cis 1,2-Dichloroethylene	3.6	6	---
Vinyl Chloride	12	0.5	0.05

1. Based on First and Second Half 2003 monitoring reports.

Time series plots for MW-8 indicate constant or falling trends for all VOCs except chlorobenzene and 1,2-Dichlorobenzene, which show increasing trends. The concentration of vinyl chloride in MW-8 has been relatively constant for the past five years. Most of the VOC declines in the other wells at the site have occurred since landfill closure in 1995 or the implementation of landfill gas venting in 1998.

38. Elevated concentrations of inorganic constituents continue to be detected in wells at the site. In 2003, general minerals were detected in MW-8 as follows:

Constituent	Concentration, mg/L	
	Background ¹	Down Gradient
Bicarbonate	38	310
Chloride	7	170
Sulfate	20	9
TDS	170	650

1. Based on upgradient well MW-1.

With the exception of sulfate, there has been no clear decline in the concentrations of inorganic constituents down gradient of the landfill since closure in 1995. Elevated concentrations of dissolved metals detected in wells at the site in 2003 included arsenic (up to 8.9 µg/L in MW-5), barium (up 900 µg/L in MW-2), and manganese (up to 9,800 µg/L in MW-2). The secondary MCL for manganese is 50 µg/L.

39. VOCs detected in MW-7 in 2003 included trichloroethylene (TCE, 2.3 µg/L), carbon tetrachloride at 1.2 µg/L, 1,1-dichloroethane (1,1-DCA, 0.3 µg/L), and vinyl chloride (0.28 µg/L). Aromatic VOCs such as toluene (24 µg/L) and xylenes (36 µg/L) have also been sporadically detected in this well. Only 1,1-DCA and vinyl chloride have been concurrently detected upgradient at higher concentrations, while TCE has been historically detected upgradient at lower concentrations and shows similar declines since landfill closure as other VOCs detected in MW-8. It is not currently known whether, or to what extent, the remaining VOCs may be from the burn dump or an offsite source.
40. The Discharger submitted a 6 May 2004 addendum to a May 1994 *Water Quality Monitoring Plan*, prepared by CH2MHILL, proposing updated/revised sampling protocols and data analysis methods for groundwater corrective action monitoring under Sections 20415(e)(4) and 20415 (e)(7) of Title 27. The data analysis methods are summarized as follows:

<u>COC Group</u>	<u>Data Analysis Method</u>	<u>Trigger^{1,2}</u>	<u>Needed for Confirmation¹</u>
VOCs & other organics	Nonstatistical	1 ≥ PQL or 2 ≥ MDL	Same COC(s) triggered in at least 1 of 2 retest samples
Inorganic COCs, < 10% in background	Nonstatistical	1 ≥ PQL	
Inorganic COCs, ≥ 10% in background	Statistical (Tolerance Interval)	1 > Concentration Limit	
Trend analysis: Monitoring Parameters & COCs	Time series plots	At least 4 historical detections >PQL for each COC ³	Not applicable

1. Notification and retest not required for tentatively indicated constituents previously confirmed as part of the release at a given monitoring point (these exceedances shall be assumed confirmed without retest).
2. "1" and "2" in listed trigger criteria refer to number of monitoring parameters or COCs.
3. Trigger for performing trend analysis not for a release.

Overpass Construction

41. The Roseville Parkway was constructed through Area C/D in 1999 and 2000. The project included removal of landfill wastes in two abutment areas, backfilling excavated areas with clean fill, and repair of disturbed portions of the landfill cover. The Parkway construction work was documented in the October 2000 *Construction Certification Report, Roseville Parkway Extension Project: Landfill-Related Construction Activities*, prepared by CH2MHILL.
42. Damage to the vegetative cover and clay layers of the Area C/D cover from Roseville

Parkway construction-related activities was repaired in 2000. The types of damage included eroded vegetative cover soil, desiccation cracks in the clay, and rocks embedded in the clay layer. Repairs included placing geosynthetic clay liner (GCL) over four areas where the clay layer was damaged and filling, grading and reseeding these and other areas of eroded vegetative cover. The repairs were documented in the October 2000 construction certification report for the Parkway referenced above.

43. The most recent aerial site survey was conducted on 15 May 2002. The survey indicated that the crest of Area C/D had settled up to one foot and the side slopes up to three feet. No significant settlement was indicated on the crest of Area B except for along the southern side slopes, which showed up to 2 feet of settlement. The Discharger fills in areas of differential settlement prior to each wet season in accordance with the post-closure maintenance plan.
44. In September 2003, the Discharger implemented repairs and improvements to the southeastern perimeter drain at Area C/D per an 18 August 2003 amended *Workplan for Gas Control Measures in the Area of GP-21 and Repair of the V-Ditch for the Roseville Landfill*, prepared by CH2MHILL. The work plan was prepared in response to a 29 January 2003 site inspection by Board staff, which found erosion and sedimentation damage in the drain. Much of the erosion appeared to be attributable to a culvert under the adjacent access road, which conveys run-on from the railway easement and Interstate 80 corridor area into the eastern perimeter drain. The drain work included excavating and re-grading the ditch, lining it with asphalt to prevent erosion, and constructing a subdrain beneath the ditch to convey subsurface flows and reduce the potential for upward head on the ditch liner. The ditch was sealed around an existing gas vent (VR-8) in the drain. The storm drain improvements were also intended to assist gas control by reducing infiltration and improving gas migration to the vents via the subdrain and subsurface cobble layer.
45. The 29 January 2003 site inspection also found significant erosion of the vegetative cover layer at the northern end of Area B, above the area where riprap had been installed during landfill closure. Follow up investigation by the Discharger revealed that overflow pipes above the culvert in the adjacent creek crossing were slightly misaligned, pointing to the base of the side slope rather than the creek. The Discharger has since repaired the damaged and installed additional Class II rip rap in the area to buttress the slope and protect it from future high velocity creek flows.
46. The City has proposed construction of a public bike trail through the landfill area as shown in Attachment B. Post-closure Specification 8 of these WDRs requires that any proposed change in post-closure use at the landfill be in accordance with Section 21190 of Title 27.

COST ESTIMATES AND FINANCIAL ASSURANCES

47. The Discharger is not required to demonstrate financial assurances for post-closure maintenance to the California Integrated Waste Management Board under Section 22210(b) of Title 27, since the landfill ceased operations prior to 1 January 1988. The Discharger is also not required to demonstrate financial assurances for corrective action to the California Integrated Waste Management Board, since pursuant to Section 22220(b), the landfill ceased operations prior to 1 July 1991.
48. The Discharger is required to provide financial assurances for post-closure maintenance and corrective action to the Regional Board, however, in accordance with Sections 22212 and 22222 of Title 27, respectively. The Discharger has not yet provided such financial assurances. These WDRs include provisions requiring that these assurances be provided, as approved by the Regional Board in coordination with the CIWMB.

CEQA AND OTHER CONSIDERATIONS

49. The City of Roseville approved a Negative Declaration (State Clearinghouse No. 95 022 048) and filed a Notice of Determination for the landfill closure project on March 22, 1995 in accordance with the California Environmental Quality Act (CEQA, Public Resources Code Section 21000 et seq.) and CEQA guidelines (14 CCR Section 15000 et seq.). The document incorporated the Final Closure and Post-Closure Maintenance Plan for the landfill as approved by Regional Board staff.
50. This action to revise WDRs for this facility is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21000, et seq.), in accordance with Title 14, CCR, Section 15301.
51. This order implements:
 - a. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition; and
 - b. Chapters 1 through 7, Subdivision 1, Division 2, Title 27, of the California Code of Regulations, effective 18 July 1997, and subsequent revisions.
52. Section 13267(b) of California Water Code provides that: "In conducting an investigation specified in subdivision (a), the Board may require that any person who has discharged, discharges, or is suspected of discharging, or who proposed to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who had discharged, discharges, or is suspected of discharging, or who proposed to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Board requires. The burden, including costs of these reports, shall bear a reasonable relationship

to the need for the reports and the benefits to be obtained from the reports.” The monitoring and reporting program required by this Order and the attached Monitoring and Reporting Program Order No. R5-2004-0104 are necessary to assure compliance with these waste discharge requirements. The Discharger operates the facility that discharges the waste subject to this Order.

PROCEDURAL REQUIREMENTS

53. All local agencies with jurisdiction to regulate land use, solid waste disposal, air pollution, and to protect public health have approved the use of this site for the discharges of waste to land stated herein.
54. 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.
55. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.
56. Any person affected by this action of the Regional Board may petition the State Water Resources Control Board to review the action in accordance with Sections 2050 through 2068, Title 23, California Code of Regulations. The petition must be received by the State Water Resources Control Board, Office of Chief Counsel, P.O. Box 100, Sacramento, California 95812, within 30 days of the date of issuance of this Order. Copies of the laws and regulations applicable to the filing of a petition are available on the Internet at http://www.swrcb.ca.gov/water_laws/index.html and will be provided on request.

IT IS HEREBY ORDERED, pursuant to Sections 13263 and 13267 of the California Water Code, that Order No. 94-015 is rescinded, and that the City of Roseville and its agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted there under, shall comply with the following:

A. DISCHARGE PROHIBITIONS

The discharge of any additional waste at this site is prohibited.

1. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.
2. The discharge of treated or untreated wastewater, sump liquid, or groundwater to any surface water or any surface water drainage course is prohibited without a National Pollutant Discharge Elimination System (NPDES) permit authorizing the discharge.

3. Neither the treatment nor the discharge of wastes shall cause a pollution or a nuisance, as defined by the California Water Code, Section 13050.

B. DISCHARGE SPECIFICATIONS

1. The discharge shall remain within the designated disposal area at all times.
2. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order.
3. Storm water runoff from the facility shall be discharged in accordance with applicable storm water regulations.
4. A minimum separation of five feet shall be maintained between wastes or leachate and the highest anticipated elevation of underlying groundwater per Section 20240(c) of Title 27.

C. POST-CLOSURE SPECIFICATIONS

1. The Discharger shall maintain waste containment facilities, the landfill final cover, precipitation and drainage controls, monitoring wells, and shall continue to monitor ground water and surface waters per Monitoring and Reporting Program No. R5-2004-0104 throughout the post-closure maintenance period.
2. All final cover slopes shall be capable of withstanding a maximum probable earthquake.
3. In spite of differential settlement, the final cover shall be graded and maintained to prevent ponding, promote lateral runoff, and prevent soil erosion due to high run-off velocities.
4. The vegetative cover layer shall be maintained with native or other vegetation capable of providing effective erosion resistance.
5. The Discharger shall conduct an aerial site survey of the site for the purpose of updating the topographic map for the site at least every five years.
6. Precipitation and drainage control systems shall be operated and maintained to convey peak flows from a 100-year, 24-hour storm event.

7. Annually, prior to the anticipated rainy season but no later than **31 October**, any necessary erosion control measures shall be implemented and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent storm water flows from:
 - a. Contacting or percolating through wastes,
 - b. Causing erosion or inundation of the landfill cover or other areas of the site, or
 - c. Causing sedimentation and clogging of the storm drains.
8. Any proposed change in post-closure use shall be in accordance with Section 21190 of Title 27.

D. FACILITY SPECIFICATIONS

1. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements. All storm water controls, including drainage facilities, shall be maintained so that they function effectively during precipitation events.
2. All wells within 500 feet of the waste management units shall have sanitary seals that meet the requirements of the Placer County Department of Health and Human Services or shall be properly abandoned. A record of the sealing and/or abandonment of such wells shall be sent to the Regional Board and to the State Department of Water Resources.
3. The Discharger or persons employed by the Discharger shall comply with all notice and reporting requirements of the State Department of Water Resources with regard to construction, alteration, destruction, or abandonment of all monitoring wells used for compliance with this Order or with Monitoring and Reporting Program No. R5-2004-0104, as required by Section 13750 through 13755 of the California Water Code.

E. MONITORING SPECIFICATIONS

1. The Discharger shall conduct groundwater and surface water monitoring, as specified in Monitoring and Reporting Program (MRP) No. R5-2004-0104. Groundwater monitoring shall include background monitoring and corrective action monitoring. Background monitoring shall be conducted for the purpose of monitoring water quality upgradient of the landfill and updating concentration limits, as necessary, as part of the Water Quality Protection Standard per Section 20400(a) of Title 27. Corrective action monitoring shall be conducted for the purpose of monitoring the nature and extent of the release (Section 20425(a)(2)), assessing the progress of corrective action measures (Section 20430(d)), and designing any necessary additional corrective action measures (Section 20425(a)(2)).

2. 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. R5-2004-0104.
3. 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. R5-2004-0104 and Title 27 CCR Section 20415(e).
4. Background for water 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).
5. 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.

Data Analysis

6. The statistical method shall account for data below the PQL with one or more statistical procedures that are protective of human health and the environment. Any PQL validated pursuant to Title 27 CCR Section 20415(e)(7) 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 Title 27 CCR Section 20415(e)(7), shall consider the PQLs listed in Appendix IX to Chapter 14 of Division 4.5 of Title 22, CCR, for guidance when specifying limits of precision and accuracy. For any given constituent monitored at a background or down-gradient monitoring point, an indication that falls between the MDL and the PQL for that constituent (hereinafter called a "trace" detection) shall be identified and used in appropriate statistical or nonstatistical tests. Nevertheless, for a statistical method that is compatible with the proportion of censored data (trace and ND indications) in the data set, the Discharger can use the laboratory's concentration estimates in the trace range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of "ties".

7. For inorganic monitoring parameters and COCs for which at least 10% of the data from background samples equal or exceed their respective MDL, the Discharger shall use the Tolerance Interval statistical method for corrective action monitoring, or an alternate statistical method approved by the Executive Officer in accordance with Section 20415(e)(8)(E). Concentration limits shall be updated at least annually. The Discharger shall use the following trigger for these constituents:
 - a. From the constituent of concern or monitoring parameter list, identify each analyte in the current sample that exceeds its PQL. The Discharger shall conclude that the exceedance provides a preliminary indication [or, for a retest, provides measurably significant evidence] of the release (i.e. existing or new constituent) at that monitoring point, if the data contains an analyte that exceeds its concentration limit.

Any analyte that triggers a discrete retest per this method shall be added to the monitoring parameter list such that it is monitored during each regular monitoring event.

8. For inorganic monitoring parameters and COCs for which less than 10% of the data from background samples equal or exceed their respective MDL, the Discharger shall use a nonstatistical data analysis method for corrective action monitoring. The Discharger shall use the following trigger for these constituents:
 - a. From the constituent of concern or monitoring parameter list, identify each analyte in the current sample that exceeds its MDL. The Discharger shall conclude that the exceedance provides a preliminary indication [or, for a retest, provides measurably significant evidence] of the release (i.e. existing or new constituent) at that monitoring point, if the data contains an analyte that exceeds its PQL.

Any analyte that triggers a discrete retest per this method shall be added to the monitoring parameter list such that it is monitored during each regular monitoring event.

9. For VOCs and other organic COCs the Discharger shall use a nonstatistical data analysis method for corrective action monitoring. The Discharger shall use the following trigger these constituents:

- a. From the constituent of concern or monitoring parameter list, identify each analyte in the current sample that exceeds either its respective MDL or PQL. The Discharger shall conclude that the exceedance provides a preliminary indication [or, for a retest, provides measurably significant evidence] of the release (i.e. existing or new constituent) at that monitoring point, if either:
 - 1) The data contains two or more analytes that equal or exceed their respective MDLs; or
 - 2) The data contains one analyte that equals or exceeds its PQL.

Any analyte that triggers a discrete retest per this method shall be added to the monitoring parameter list such that it is monitored during each regular monitoring event.

Discrete Retest

10. If the above statistical or non-statistical trigger procedures used for groundwater monitoring data analysis provide a preliminary indication of previously undetected or unconfirmed constituents of the release, the Discharger shall immediately notify Regional Board staff by phone or e-mail and, within 30 days of such indication, shall collect *two* new (retest) samples from the monitoring point where the release is preliminarily indicated.
 - a. For any given retest sample, the Discharger shall include, in the retest analysis, only the laboratory analytical results for those analytes detected in the original sample. As soon as the retest data are available, the Discharger shall apply the same tests [i.e. 7.a for statistical constituents, 8.a or 9.a for non-statistical constituents], to separately analyze each of the two suites of retest data at the monitoring point where the release is preliminarily indicated.
 - b. If either (or both) of the retest samples trips the applicable trigger above (7.a, 8.a or 9.a), then the Discharger shall conclude that there is measurably significant evidence of a release at that monitoring point for the analyte(s) indicated in the validating retest sample(s) and shall:
 - 1) Immediately notify the Regional Board about the constituent verified to be present at the monitoring point, and follow up with written notification submitted by certified mail within seven days of validation; and
 - 2) Comply with 11, below.

Constituents that have been previously confirmed at a given monitoring point as part of the release, including both regularly detected monitoring parameters/COCs and sporadically detected monitoring parameters/COCs (e.g. as a result of seasonal or lateral fluctuations in the plume or landfill gas), shall be considered confirmed without notification and retest. Exceedances that the Discharger otherwise demonstrates (per Section 20420(k)(7) of Title 27) are the result of sample corruption, laboratory interferences, error, natural variation in the groundwater or other cause not associated with a release from the unit shall not trigger notification of a tentative release, and shall not trigger a retest unless a retest is necessary to make the demonstration.

11. If the Discharger determines that there is measurably significant evidence of a new release from the Unit at any monitoring point, the Discharger shall **immediately** implement the requirements of **Response To A Release**, contained in the Standard Provisions and Reporting Requirements (August 1997).
12. The data analysis methods for corrective action monitoring shall also include trend analysis (i.e. control charts, Mann-Kendall and/or time series plots) and an evaluation of the water chemistry by appropriate methods (i.e. Schoeller plots, ion balance, Stiff diagram etc) to monitor the effectiveness of corrective action measures in accordance with Section E.3.C of the MRP. The trigger requirement for performing trend analysis for a given monitoring parameter or COC shall be at least four historical detections at concentrations exceeding the PQL.

F. REPORTING REQUIREMENTS

1. The Discharger shall comply with the reporting requirements specified in this Order, in Monitoring and Reporting Program Order No. R5-2004-0104 and in the Standard Provisions and Reporting Requirements dated August 1997.
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 site conditions that could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.
3. The Discharger shall notify the Regional Board in writing of any proposed change in ownership or responsibility for construction or operation of the landfill. 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 the Standard Provisions (Reporting Requirement 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.

4. The discharger shall **mail a copy of each** monitoring **report** and any other reports required by this Order to:

California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670
(or the current address if the office relocates)

G. PROVISIONS

1. The Discharger shall maintain a copy of this Order and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.
2. The Discharger shall comply with the Monitoring and Reporting Program No. R5-2004-0104, which is attached to and made part of this order. A violation of the MRP is a violation of these waste discharge requirements.
3. The Discharger shall comply with the Standard Provisions and Reporting Requirements (Standard Provisions), dated August 1997, which are hereby incorporated into this Order. The Standard Provisions contain important provisions and requirements with which the Discharger must comply. A violation of any of the Standard Provisions and Reporting Requirements is a violation of these waste discharge requirements.
4. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, Monitoring and Reporting Program No. R5-2004-0104, and the Standard Provisions and Reporting Requirements, dated August 1997.
5. **On or before 30 September 2004**, the Discharger shall submit a work plan and schedule for the installation of point of compliance wells down gradient of Areas B and C/D. The Water Quality Protection Standard Report shall be amended to include these wells once it is installed.

6. If the Discharger or Regional Board determines that the corrective action program is not adequate (i.e. does not satisfy the provisions of Section 20430), the Discharger shall, within 90 days of making the determination, or of receiving written notification from the Regional Board of such determination, submit an amended report of waste discharge (RWD) to make appropriate changes to the program. The amended RWD shall include the following:
 - a. A discussion as to why existing corrective action measures have been ineffective or insufficient.
 - b. A revised evaluation monitoring plan if necessary to further assess the nature and extent of the release
 - c. A discussion of corrective action needs and options.
 - d. Proposed additional corrective action measures, as necessary, for:
 - i) Source control,
 - ii) Adequate separation from groundwater,
 - iii) Groundwater cleanup, and/or
 - iv) Landfill gas control
 - e. A plan to monitor the progress of corrective action measures consistent with the MRP
 - f. Cost estimates for implementing additional corrective action, including monitoring
 - g. An implementation schedule.
7. The Discharger shall maintain assurances of financial responsibility for post-closure maintenance of the landfills in an amount approved by the Executive Officer in consultation with the California Integrated Waste Management Board (CIWMB). The financial assurances mechanism shall be an irrevocable fund or other acceptable mechanism under the CIWMB-promulgated sections of Chapter 6, Title 27, but with the Regional Board named as beneficiary.
8. The Discharger shall maintain assurances of financial responsibility for initiating and completing corrective action for all known or reasonably foreseeable releases from the landfills in an amount approved by the Executive Officer. The financial assurances mechanism shall be an irrevocable fund or other acceptable mechanism under the CIWMB-promulgated sections of Chapter 6, Title 27, but with the Regional Board named as beneficiary.
9. 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.

10. 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.
11. The Discharger shall also notify the Regional Board of any proposed land use or closure plan changes. This notification shall be given 90 days prior to the effective date of the change and shall be accompanied by an amended Report of Waste Discharge and any technical documents that are needed to demonstrate continued compliance with these waste discharge requirements.
12. The Regional Board will review this Order periodically and will revise these requirements when necessary.

I, THOMAS R. PINKOS, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 9 July 2004.

THOMAS R. PINKOS, Executive Officer

JDM

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2004-0104
MONITORING AND REPORTING PROGRAM
FOR
CITY OF ROSEVILLE
ROSEVILLE LANDFILL
CLASS III LANDFILLS
POST-CLOSURE MAINTENANCE AND CORRECTIVE ACTION
PLACER COUNTY

The facility operated from 1967 through 1979, accepting primarily nonhazardous household and commercial wastes from the City of Roseville area. Landfill Areas A and B accepted primarily construction debris and street sweeping wastes, including green waste, brush and wood debris. Area C/D accepted municipal solid waste (MSW) including household refuse. Ash and other residual solid wastes from burn dump operations were discharged to the burn dump.

A 1988 Solid Waste Assessment Test (SWAT) investigation found volatile organic compounds (VOCs) and elevated concentrations of inorganic constituents in groundwater at the site. VOCs have also been detected in the landfill gas at the site. In 1995 the Discharger installed a low permeability clay cover and a passive gas collection and venting system for methane control. Since then, the concentration of most VOCs detected in wells at the site have declined significantly, however some VOCs, including vinyl chloride, remain above drinking water standards in point of compliance wells.

Pursuant to Section 20080(g) of Title 27, the Discharger shall maintain water quality monitoring systems for background and corrective action monitoring. Compliance with this MRP is ordered by Waste Discharge Requirements (WDRs) Order No. R5-2004-0104.

A. SUMMARY OF MONITORING & REPORTING FREQUENCIES

Table A

Section	Reporting	Frequency
B.	1. Semiannual Report	Semiannually
	2. Annual Summary Report	Annually
	3. Constituents of Concern Report	Every 5 years
C.	Water Quality Protection Standard Report	Update as necessary

Section	Monitoring	Frequency
D.	Leachate Monitoring	Same as F.1
E.	Groundwater Monitoring:	
	1. Elevation	Quarterly
	2. Background & Corrective Action Monitoring	Semiannually
	3. Constituents of Concern	Every 5 years

Section	Monitoring	Frequency
F.	Facility Monitoring:	
	1. Standard Observations	
	A. Wet Season (Oct. 1 – Apr. 30)	Monthly
	B. Dry Season (May 1 – Sept. 30)	Quarterly
	2. Maintenance Inspections	Quarterly
	3. After Storm Events	Within 7 Days After Significant Storm Event (i.e. ≥ 2 inches)
	4. Site Winterization	Annually

B. REPORTING

1. Semiannual Reports

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required under Order No. R5-2004-0104 and the Standard Provisions and Reporting Requirements (August 1997). Reports shall be submitted **semiannually**. Each semiannual monitoring report shall include the following information:

- A. A compliance evaluation summary for the monitoring period.
- B. A tabular summary of well information from the installation logs, including well name, top-of-casing elevation, total depth, depths/elevations of screened interval, aquifer or zone (i.e. uppermost), and soil type(s) over the screened interval.
- C. The results of groundwater elevation monitoring.
- D. Tabular summaries of corrective action monitoring data for each unit showing well, constituents, concentrations, and concentration limits. The tables shall also clearly show whether new monitoring data exceedances occurred during the monitoring period (i.e. highlight exceedances).
- E. Contaminant contour maps of representative corrective action monitoring data, showing the estimated extent of the contaminant plume.
- F. Tables of historical monitoring data for each unit showing well, sampling dates, constituents, concentrations, and concentration limits. The data shall be presented so as to clearly show historical concentrations at each well.
- G. Plots, graphical summaries and a narrative discussion of the results of correction action monitoring, as specified in Section E.3 herein.
- H. Field and laboratory tests sheets.

At least one semiannual monitoring report each year shall include a copy of the Sample Collection and Analysis Plan (sampling plan) referenced in the Standard Provisions (Provision 1, *Provisions for Monitoring*).

2. Annual Monitoring Summary Report

An Annual Monitoring Summary Report (Annual Report) shall also be prepared and submitted in accordance with this section of the MRP and the Standard Provisions (*Provision 4, Reports to be Filed with the Board, REPORTING REQUIREMENTS*). The report shall summarize monitoring results for the prior year and include a discussion of compliance with the WDRs and the Water Quality Protection Standard.

The report shall contain both tabular and graphical summaries, including time series plots of historical monitoring data (including the prior year's data) for each monitoring parameter/COC. For corrective action monitoring data, the report shall also include the following:

- A. A summary of the results of trend analysis performed on each constituent of the release during the prior year
- B. A summary of the results of water chemistry analysis of water quality data collected during the prior year.
- C. Contaminant contour maps for representative constituents (i.e. total VOCs, TDS, Chloride) constructed as part of semiannual reporting during the prior year and a discussion as to whether the size of the plume and concentrations within have increased, decreased, or remained the same since the previous monitoring year.

An electronic copy of the monitoring data for both semiannual periods shall also be included in the Annual Report in a digital format acceptable to the Executive Officer. The Annual Report may be included in the Second Semiannual Report for each year.

Reports which do not comply with the above-required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the waste discharge requirements. The semiannual and annual 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>Report</u>	<u>End of Reporting Period</u>	<u>Date Report Due</u>
First Semiannual	30 June	31 July
Second Semiannual	31 December	31 January
Annual Report	31 December	31 January

C. WATER QUALITY PROTECTION STANDARD (Section 20390)

The Water Quality Protection Standard (WQPS) shall consist of all Constituents of Concern, Concentration Limits for each constituent of concern, Monitoring Points, Point of Compliance, and the Compliance Period.

1. Constituents of Concern (Section 20395 of Title 27)

The constituents of concern (COCs) for the landfill shall be as follows:

Constituents of Concern	Units	Test Method
Field Parameters:	See Attachment E	
General Minerals:	See Attachment E	
Inorganics (dissolved)	µg/L	See Attachment E
Volatile Organic Compounds	µg/L	USEPA Method 8260B
Semi-Volatile Organic Compounds	µg/L	USEPA Method 8270
Polychlorinated Biphenols (PCBs)	µg/L	USEPA Method 8082

Constituents of Concern	Units	Test Method
Chlorinated Herbicides	µg/L	USEPA Method 8151
Organochlorine Pesticides	µg/L	USEPA Method 8081A
Organophosphorus Pesticides	µg/L	USEPA Method 8141A

2. Concentration Limits (Section 20400)

- a. For VOCs and other organic COCs the concentration limit shall be the MDL.
- b. For inorganic monitoring parameters and COCs for which at least 10% of the data from background samples equal or exceed their respective MDL, the concentration limit shall be determined as follows:
 - i. Using the Tolerance Interval statistical procedure applied to historical background data, or
 - ii. Using an alternative statistical method approved by the Executive Officer per Monitoring Specification E.7 of the WDRs.
- c. For inorganic monitoring parameters and COCs for which less than 10% of the data from background samples equal or exceed their respective MDL, the concentration limit shall be the PQL.

Prior to calculating tolerance limits, background data shall be screened for significant rising or falling trends. If a significant trend is identified that reflects changes in background conditions, the trend data shall be used to update concentration limits. If not, concentration limits shall be developed only from prior historical data. Tolerance limits shall take into account seasonality.

3. Monitoring Points (Section 20405)

The monitoring points for groundwater monitoring shall be as listed in Table E.3A herein.

4. Point of Compliance (Section 20405)

The point of compliance (POC) for the water standard is a vertical surface located at the hydraulically down gradient limit of each Unit that extends through the uppermost aquifer underlying the Unit. The POC wells shall be MWs-5, 7, 8 and any future wells installed along the POC of Area B, Area C/D or the burn dump.

5. Compliance Period (Section 20410)

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 confirms a new release from the unit.

D. LEACHATE MONITORING

The Discharger shall monitor the landfill for leachate seeps **monthly** during the wet season and **quarterly** during the dry season as part of Standard Observations. Any leachate seeps observed during these inspections or at any other time shall be sampled and analyzed for the

constituents of concern referenced in Table C herein. Reporting shall be conducted in accordance with the Standard Provisions (*Provision 3, Reports to be Filed with the Board, REPORTING REQUIREMENTS*).

E. GROUNDWATER MONITORING

1. Groundwater Elevation Monitoring (Section 20415(e)(13))

The groundwater surface elevation (in feet and hundredths, MSL) in all wells and piezometers shall be measured on a **quarterly** basis. Groundwater elevations taken prior to purging the well and sampling for Monitoring Parameters may be used to fulfill this requirement. Groundwater elevations for all upgradient and down gradient wells for a given groundwater body shall be measured within a period of time short enough to avoid temporal variations in groundwater flow which could preclude accurate determination of groundwater gradient and direction. The results of groundwater elevation monitoring shall be displayed on a water table contour map and/or groundwater flow net for the site and included in each monitoring report. The Discharger shall use the groundwater elevation monitoring data to determine the following:

- A. The groundwater flow velocity
- B. The gradient direction in the upper aquifer, and in any additional zone of saturation monitored pursuant to this MRP
- C. Times of highest and lowest elevations of the water levels in the wells
- D. Separation of groundwater from the lowest point of the unit

The results of these determinations shall be included in the semi-annual reports.

2. Background Monitoring (Section 20415(b)(1)(A))

The Discharger shall install and operate a sufficient number of Background Monitoring Points at appropriate locations and depths to yield ground water samples from the uppermost aquifer that represent the quality of ground water that has not been affected by a release from the units per Section 20415(b)(1)(A) of Title 27.

- A. Monitoring Points: As specified in Table E.3A.
- B. Monitoring Schedule: As specified in Table E.3B.

Background monitoring data analysis shall include developing/updating concentration limits for statistical monitoring parameters and COCs, as necessary.

3. Corrective Action Monitoring (Sections 20425 and 20430)

The Discharger shall install and operate a groundwater corrective action monitoring system for the purpose of monitoring the nature and extent of the release and the progress of corrective action. A sufficient number of samples shall be taken from all Monitoring Points and Background Monitoring Points to satisfy the data analysis requirements for a given Reporting Period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible. Collection and analysis of samples

shall be in accordance with procedures set forth in the Sampling and Analysis Plan per the Standard Provisions (Provision 1, *Provisions for Monitoring*).

A. The groundwater monitoring points for the landfills shall be as follows:

Table E.3A
Background and Corrective Action Monitoring Wells

Unit	Background	Down Gradient	Side Gradient
Area B	MWs-1, 2 and 3	MW-12	MWs-9, 10A and 10B
Area C/D	MW-1	MWs- 5, 8, 13 and 14	MW-2, 12
Burn Dump	MW-6	MW-7	---

The corrective action monitoring locations for each unit shall also include future wells installed along the point of compliance, down gradient, and/or side gradient of the unit to monitor the nature and extent of the release and/or progress of corrective action (see WDR Provisions G.5 and G.6).

B. Monitoring Schedule

Groundwater samples shall be collected and analyzed in accordance with the following schedule:

Table E.3B
Corrective Action Monitoring Schedule

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>	<u>Monitoring Approach</u>	
Field Parameters			<u>Nature/Extent</u>	<u>Trends</u>
Elevation	Feet MSL	Quarterly	---	---
Specific Conductance	µMhos/cm	Semiannually	---	---
pH	pH units	Semiannually	---	---
Temperature	°C	Semiannually	---	---
Turbidity	NTU	Semiannually	---	---

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>	<u>Monitoring Approach</u>	
			<u>Nature/Extent</u>	<u>Trends</u>
Monitoring Parameters (Attachment D)				
General Minerals				
TDS	mg/L	Semiannually	Interwell	Intrawell
Chloride	mg/L	Semiannually	Interwell	Intrawell
Total Alkalinity	meq/L	Semiannually	Interwell	Intrawell
VOCs	µg/L	Semiannually	Intrawell	Intrawell
Major Anions	mg/L	Annually	Interwell	Intrawell
Major Cations	mg/L	Annually	Interwell	Intrawell
Dissolved Inorganics	µg/L	Annually	Interwell/Intrawell	Intrawell
			1	
Constituents of Concern (Attachment E)		Every 5 years	Interwell/Intrawell	Intrawell
			1	

Five-year COC monitoring under this Order shall be conducted by **30 November 2005** and at least every five years thereafter.

C. Monitoring Data Analysis

Monitoring data analysis shall include the following:

- a. Background Data
 - Updating concentration limits for statistical monitoring parameters and COCs, as necessary.
- b. Nature and Extent of Release
 - Comparisons with concentration limit to identify any new or previously undetected constituents at a monitoring point
 - Water chemistry analysis by appropriate methods (i.e. ion balance, Piper diagram, Stiff diagram etc.).
 - Preparation of contaminant contour maps for representative constituents of the release.
- c. Effectiveness of Corrective Action (Section 20430(h))
 - An evaluation of the effectiveness of corrective action measures (e.g. landfill cover, gas controls)
 - Preparation of time series plots for representative constituents
 - Trend analysis for each constituent using appropriate statistical and/or graphical methods
 - Comparison of contaminant contour maps for representative constituents of the release showing historical changes in plume size and concentrations.

The results of the above analysis, including a narrative discussion, shall be included in each semiannual report and summarized in the Annual Report, as specified under Reporting B.2, above. The semiannual monitoring report shall also include a discussion of the progress of corrective action toward returning to compliance with the Water Quality Protection Standard, as specified in Section 20430(h) of Title 27.

F. FACILITY MONITORING

1. Standard Observations

Standard Observations shall be performed **monthly** during the wet season (October 1 to April 30) and **quarterly** during the dry season (May 1 to September 30) and shall include those elements identified in Definition 24 of the Standard Provisions. Each monitoring report shall include a summary and certification of completion of all Standard Observations in accordance with the Standard Provisions (*Provision 2h, Reports to be Filed with the Board, REPORTING REQUIREMENTS*). Field logs of standard observations shall also be included in the report.

2. Regular Maintenance Inspections

Landfill facilities (i.e. monitoring wells) shall be inspected **quarterly** to identify the need for maintenance and repairs in accordance with the Post-Closure Maintenance Plan. Necessary repairs shall be completed within 30 days of each inspection. Field logs of these inspections and documentation of the repairs shall be included in each semiannual monitoring report.

3. After Storm Events

Within seven days following each significant storm event (i.e. one which produces 2.0 inches or more of precipitation within a 24-hour period, as measured at the Roseville Filter Plant Station), the Discharger shall inspect the landfill cover and precipitation and drainage facilities for damage. Areas of erosion or sedimentation observed during the inspection(s) shall be flagged and repaired within seven days of identification. If repairs cannot be completed within the seven-day time frame, the Discharger shall notify the Regional Board of such and provide a schedule for completing necessary repairs. Findings and repairs implemented as a result of these inspections shall be included in each semiannual monitoring report. If no inspection was conducted because there was no significant storm event during the semiannual period, the report shall state such fact.

4. Site Winterization

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger shall conduct an inspection of the facility for the purpose of winterizing the site. The inspection shall identify any damage to the landfill cover, grade, precipitation and drainage controls, access roads and other landfill facilities. Any necessary construction, maintenance, or repairs to these facilities shall be completed by **31 October**. The Discharger shall document the results of the winterization inspection and any repair measures implemented in the Annual Report due by **31 January** of each year.

Documentation of the results of the above inspections and any repairs implemented shall include field observations, the location of any damage observed (i.e. on a site map), photographs of the damage, and a description of any repairs implemented, including post-repair photographs.

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

Ordered by: _____
THOMAS R. PINKOS, Executive Officer

9 July 2004

(Date)

Attachments
JDM:

INFORMATION SHEET

ORDER NO. R5-2004-0104
CITY OF ROSEVILLE
ROSEVILLE LANDFILL
PLACER COUNTY

The landfill operated from 1967 through 1979, accepting primarily nonhazardous household, construction and commercial wastes. The facility originally included four unlined units, referred to as Areas A, B, C and D. Areas A and B accepted primarily construction debris and street sweeping wastes, including green waste, brush and wood debris. Area C/D accepted municipal solid waste (MSW) including household refuse. Most of Area A landfill was clean-closed in the mid-1980s and consolidated into Area B. Areas B, C and D were closed with a low permeability clay cover in 1995. Areas C and D were closed as a single closure unit (referred to as "Area C/D").

Landfill Gas

Methane concentrations up to 55 percent by volume have been historically detected in landfill gas (LFG) probes along the south and southeastern perimeters of Area C/D. VOCs detected in groundwater have also been historically detected in the LFG. To address the perimeter methane exceedances, the Discharger installed passive LFG controls as part of landfill closure in 1995. Since 1995, five vents (VRs-8 through 11), five additional LFG monitoring wells (LFG-7 through 11), and several gas monitoring probes have been installed along the eastern site perimeter for methane monitoring/control. VRs-9, 10, and 11 were installed in 2003 along the eastern perimeter drain. No methane exceedances have been detected along the landfill perimeter since installation of these vents.

Corrective Action

A 1988 Solid Waste Assessment Test (SWAT) investigation found volatile organic compounds (VOCs) and elevated concentrations of inorganic constituents in groundwater at the site. VOCs have also been detected in the landfill gas at the site. Since landfill closure and the installation of the passive gas collection and venting system, the concentration of most VOCs detected in wells at the site have declined significantly, however some VOCs, including vinyl chloride, remain above drinking water standards in point of compliance wells.

Roseville Parkway Construction

The Roseville Parkway was constructed through Area C/D in 1999 and 2000. The project included removal of landfill wastes beneath the Interstate-80 (i.e. southeast) and Antelope Creek (northwest) parkway abutment areas. Approximately 470 cubic yards of waste was removed from the southeast abutment area and 3,500 cubic yards of waste was removed from the northwest abutment area after removal of the landfill cover. Wedge-shaped areas were excavated and backfilled with engineered fill to provide structural support for the abutments. Foundation layer soil was then placed over the fill and re-compacted to original specifications. On the southeast side, geosynthetic clay liner (GCL) was placed over the foundation layer, while on the northwest side, the LHC layer was re-constructed using the original LHC clay. Both the foundation and LHC layers were keyed into the adjacent landfill cover layers. After engineering

the abutment support areas, vegetative cover soil was removed from the remainder of the parkway corridor and approximately 45 feet of engineered fill was placed over the LHC layer to raise the parkway to design elevation. The embankment slopes were graded to 2H:1V and seeded to establish vegetation for erosion control.

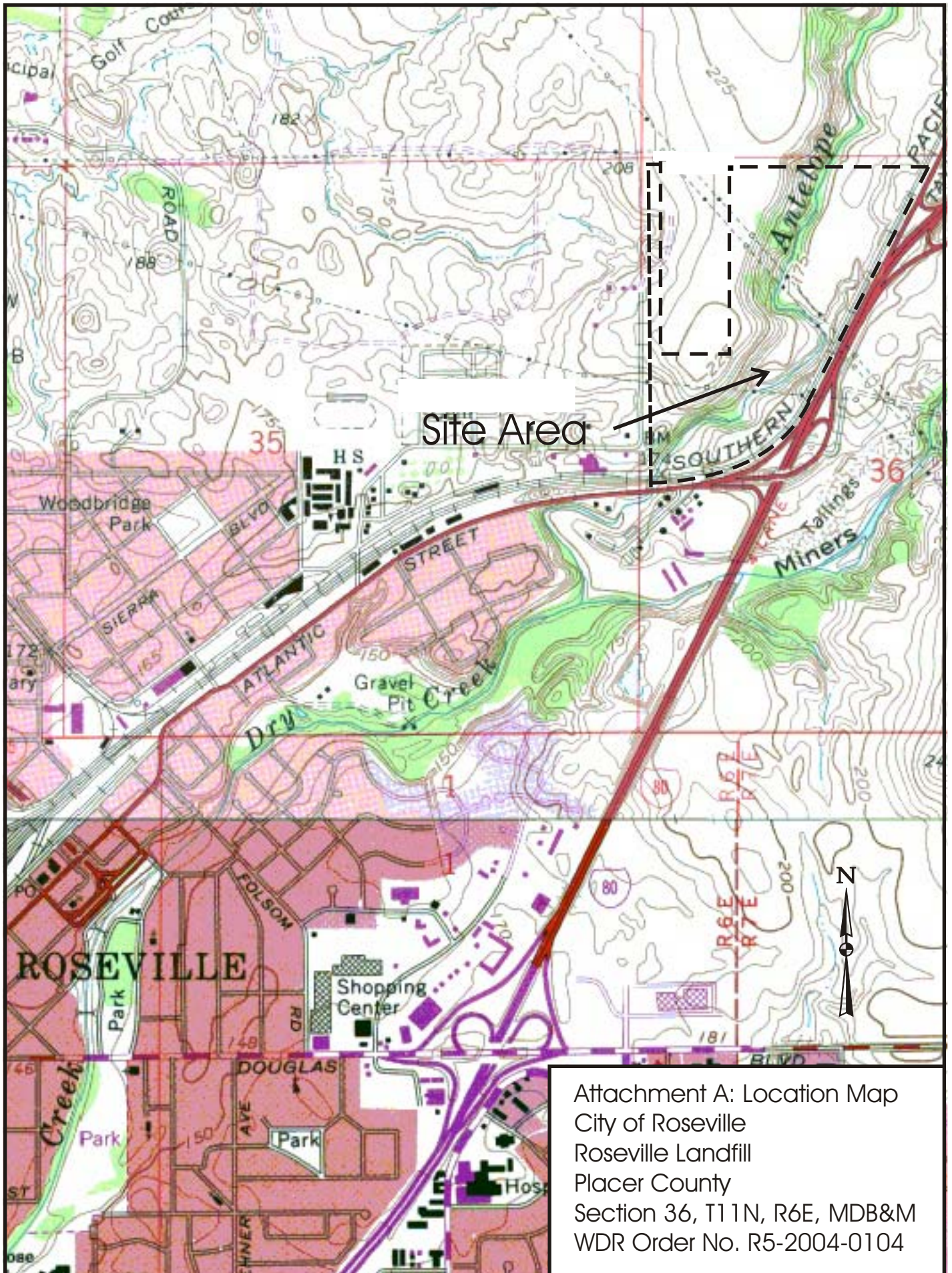
Flood Control

Portions of the landfill side slopes lie within the 100-year flood plain. During landfill closure in 1995, riprap was placed at three locations along the base of the landfill units (i.e.) to help protect against erosion from high (i.e. 100-year) creek flows. These areas included the northern toe slope and creek crossing areas of Area B, and the eastern and northeastern side slopes of Area C/D. The riprap sections were designed as follows:

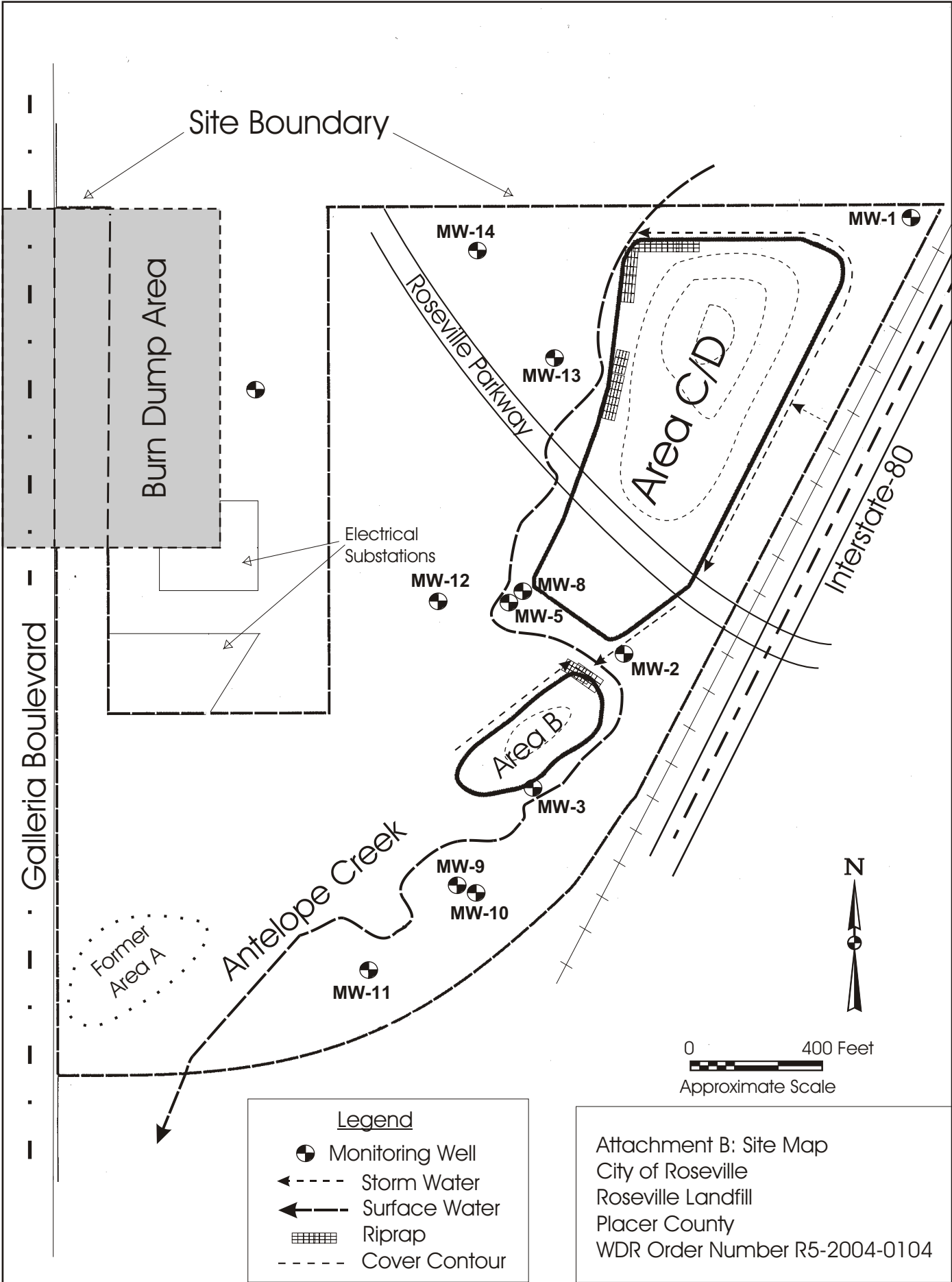
Area	Location	Average Rock Size, inches	Riprap Design Area, Yards²	Maximum Elevation Feet, MSL
C/D	Eastern slope	8	1100	177
C/D	Northeast slope	8	980	178
B	Northern slope	18	900	169
B	Creek crossing	18	900	169

Surface Water

The site receives an average of 22.5 inches per year of precipitation. Antelope Creek meanders from northeast to southwest through the site, flowing along the west side of Area C/D, between Area C/D and B, and then along the east side of Area B. Downstream of the site it joins Dry Creek, tributary to the Natomas East Main Drain, and the Sacramento River.



Attachment A: Location Map
City of Roseville
Roseville Landfill
Placer County
Section 36, T11N, R6E, MDB&M
WDR Order No. R5-2004-0104



Site Boundary

Burn Dump Area

Galleria Boulevard

Former Area A

Antelope Creek

Electrical Substations

MW-14

MW-13

MW-1

MW-12

MW-8

MW-5

MW-2

Area B

MW-3

MW-9

MW-10

MW-11

Roseville Parkway

Area C/D

Interstate-80



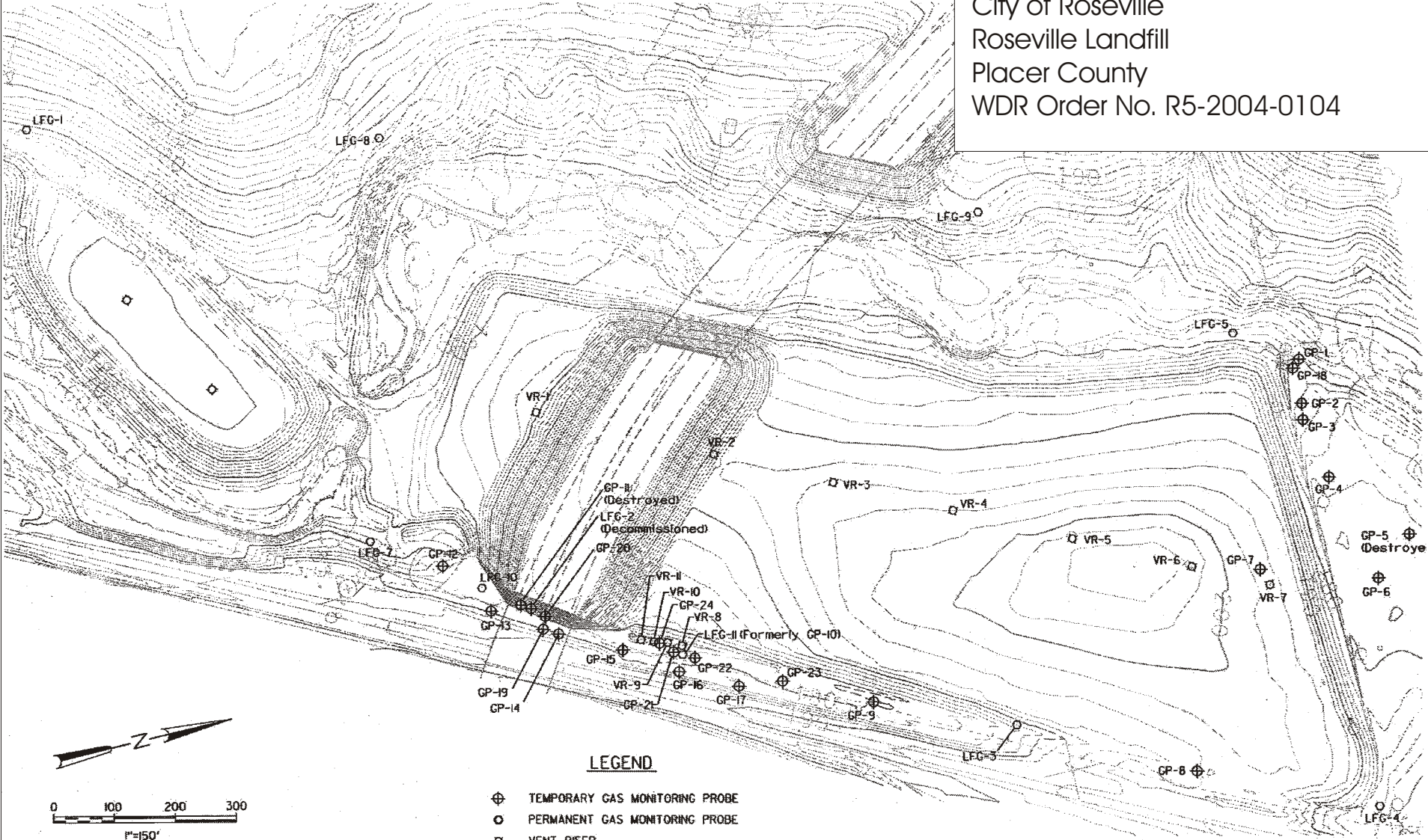
0 400 Feet
Approximate Scale

Legend

- Monitoring Well
- ← Storm Water
- ← Surface Water
- ▨ Riprap
- - - Cover Contour

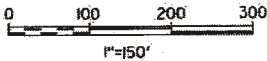
Attachment B: Site Map
City of Roseville
Roseville Landfill
Placer County
WDR Order Number R5-2004-0104

Attachment C: Gas Facilities Map
 City of Roseville
 Roseville Landfill
 Placer County
 WDR Order No. R5-2004-0104



LEGEND

- ⊕ TEMPORARY GAS MONITORING PROBE
- PERMANENT GAS MONITORING PROBE
- VENT RISER



NOTE: TOPO AND GRADING TAKEN FROM 1997 FILES
 AND MAY NOT REFLECT CURRENT CONDITIONS.

ATTACHMENT D

MONITORING PARAMETERS & APPROVED USEPA ANALYTICAL METHODS

Field Parameters	USEPA Test Method
pH	----
Specific conductance	----
Temperature	----
Turbidity	----
General Minerals	USEPA Test Method
Total Dissolved Solids (TDS)	2540C
Total Alkalinity	2310B
Total Hardness	2340B
<u>Major Anions</u>	
Bicarbonate	2310B
Chloride	300 (anion scan)
Nitrate – Nitrogen	300 (anion scan)
Sulfates	300 (anion scan)
<u>Major Cations</u>	
Calcium	200.7 (trace method)
Magnesium	200.7 (trace method)
Potassium	200.7 (trace method)
Sodium	200.7 (trace method)
Dissolved Inorganics ¹	USEPA Test Method
Aluminum	200.7/6010
Antimony	200.7/6010
Arsenic	200.9/200.8
Barium	200.7/6010
Beryllium	200.7/6010
Cadmium	200.7/6010
Chromium	200.7/6010
Cobalt	200.7/6010
Copper	200.7/6010
Iron	200.7/6010
Lead	200.9/200.8
Manganese	200.7/6010
Mercury	7470A
Molybdenum	200.7/6010
Nickel	200.9/200.8

ATTACHMENT D (CON'T)

Selenium	200.9/200.8
Silver	200.7/6010
Sulfide	9030
Thallium	200.7/6010
Tin	200.7/6010
Vanadium	200.7/6010
Zinc	200.7/6010

Volatile Organic Compounds² (VOCs) (by USEPA Method 8260B):

Acetone
Acetonitrile
Acrolein
Acrylonitrile
Allyl chloride (3-Chloropropene)
Tert-Amyl ethyl ether
Tert-Amyl methyl ether
Benzene
Bromobenzene
Bromochloromethane
Bromodichloromethane
Bromoform (Tribromomethane)
Tert-Butyl alcohol
n-Butylbenzene
sec-Butylbenzene
tert-Butylbenzene
tert-Butyl ethyl ether
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Chloroprene
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans-1,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC-12)
1,1-Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1 -Dichloroethylene (1,1 -Dichloroethene; Vinylidene chloride)
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene)

ATTACHMENT D (CON'T)

1,2-Dichloropropane (Propylene dichloride)
1,3-Dichloropropane
2,2-Dichloropropene
1,1-Dichloropropene
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Ethylbenzene
Ethyl methacrylate
Hexachlorobutadiene
Hexachloroethane
2-Hexanone (Methyl butyl ketone)
Iodomethane (Methyl iodide)
Isobutyl alcohol
di-Isopropyl ether
Methacrylonitrile
Methyl bromide (Bromomethene)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Methyl chloride (Chloromethane)
Methyl ethyl ketone (MEK: 2-Butanone)
4-Methyl-2-pentanone (Methyl isobutylketone)
Methyl tert-butyl ether (MtBE)
Naphthalene
2-Nitropropane
n-Propylbenzene
Propionitrile
Styrene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
Toluene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane (Methylchloroform)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
Vinyl chloride
Xylenes (total)

-
1. Samples shall be filtered prior to performing dissolved inorganics analysis.
 2. Unknown chromatographic peaks shall be reported, along with an estimate of the concentration of the unknown analyte.

ATTACHMENT E

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Field Parameters	USEPA Test Method
pH	----
Specific conductance	----
Temperature	----
Turbidity	----
General Minerals	USEPA Test Method
Total Dissolved Solids (TDS)	2540C
Total Alkalinity	2310B
Total Hardness	2340B
<u>Major Anions</u>	
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Sodium	200.7 (trace method)
Dissolved Inorganics ¹	USEPA Test Method
Aluminum	200.7/6010
Antimony	200.7/6010
Arsenic	200.9/200.8
Barium	200.7/6010
Beryllium	200.7/6010
Cadmium	200.7/6010
Chromium	200.7/6010
Chromium VI ⁺	7199/1636
Cobalt	200.7/6010
Copper	200.7/6010
Cyanide	335.4/9010
Iron	200.7/6010
Lead	200.9/200.8
Manganese	200.7/6010
Mercury	7470A
Molybdenum	200.7/6010
Nickel	200.9/200.8

ATTACHMENT E (CON'T)

Selenium	200.9/200.8
Silver	200.7/6010
Sulfide	9030
Thallium	200.7/6010
Tin	200.7/6010
Vanadium	200.7/6010
Zinc	200.7/6010

Volatile Organic Compounds² (VOCs) (by USEPA Method 8260B):

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Acetonitrile
Acrolein
Acrylonitrile
Allyl chloride (3-Chloropropene)
Tert-Amyl ethyl ether
Tert-Amyl methyl ether
Benzene
Bromobenzene
Bromochloromethane
Bromodichloromethane
Bromoform (Tribromomethane)
Tert-Butyl alcohol
n-Butylbenzene
sec-Butylbenzene
tert-Butylbenzene
tert-Butyl ethyl ether
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Chloroprene
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
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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
2,2-Dichloropropene

ATTACHMENT E (CON'T)

1,1-Dichloropropene
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Ethylbenzene
Ethyl methacrylate
Hexachlorobutadiene
Hexachloroethane
2-Hexanone (Methyl butyl ketone)
Iodomethane (Methyl iodide)
Isobutyl alcohol
di-Isopropyl ether
Methacrylonitrile
Methyl bromide (Bromomethene)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Methyl chloride (Chloromethane)
Methyl ethyl ketone (MEK: 2-Butanone)
4-Methyl-2-pentanone (Methyl isobutylketone)
Methyl tert-butyl ether (MtBE)
Naphthalene
2-Nitropropane
n-Propylbenzene
Propionitrile
Styrene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
Toluene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane (Methylchloroform)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
Vinyl chloride
Xylenes (total)

ATTACHMENT E (CON'T)

Semivolatile Organic Compounds² (USEPA Method 8270 - base, neutral, & acid extractables):

Acenaphthene
Acenaphthylene
Acetophenone
2-Acetylaminofluorene (2-AAF)
4-Aminobiphenyl
Anthracene
Benzo[a]anthracene (Benanthracene)
Benzo[b]fluoranthene
Benzo[k]fluoranthene
Benzo[g,h,i]perylene
Benzo[a]pyrene
Benzyl alcohol
Bis(2-ethylhexyl) phthalate
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)
p-Chloroaniline
p-Chloro-m-cresol (4-Chloro-3-methylphenol)
2-Chloronaphthalene
2-Chlorophenol
4-Chlorophenyl phenyl ether
Chrysene
o-Cresol (2-methylphenol)
m-Cresol (3-methylphenol)
p-Cresol (4-methylphenol)
Dibenz[a,h]anthracene
Dibenzofuran
Di-n-butyl phthalate
3,3'-Dichlorobenzidine
2,4-Dichlorophenol
2,6-Dichlorophenol
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
Ethyl methanesulfonate
Famphur

ATTACHMENT E (CON'T)

Fluoranthene
Fluorene
Hexachlorobenzene
Hexachloropropene
Indeno(1,2,3-c,d)pyrene
Isophorone
Isosafrole
Kepone
Methapyrilene
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
2,4,5-Trichlorophenol
0,0,0-Triethyl phosphorothioate
sym-Trinitrobenzene

ATTACHMENT E (CON'T)

Organochlorine Pesticides² (USEPA Method 8081A)

Aldrin
 α -BHC
 β -BHC
 γ -BHC (Lindane)
 δ -BHC
Chlorobenzilate
 α -Chlordane
 γ -Chlordane
Chlordane – not otherwise specified
DBCP
4,4'-DDD
4,4'-DDE
4,4'-DDT
Diallate
Dieldrin
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Endrin ketone
Heptachlor
Heptachlor epoxide
Hexachlorocyclopentadiene
Isodrin
Methoxychlor
Toxaphene

Polychlorinated Biphenols² (PCBs, USEPA Method 8082)

Aroclor 1016
Aroclor 1221
Aroclor 1232
Aroclor 1242
Aroclor 1248
Aroclor 1254
Aroclor 1260

Organophosphorus Pesticides² (USEPA Method 8141A):

Chlorpyrifos
Diazinon
Dimethoate
Disulfoton
Ethion
Famphur
Malathion
Parathion
Parathion-ethyl

ATTACHMENT E (CON'T)

Parathion-methyl
Phorate

Chlorinated Herbicides² (USEPA Method 8151A):

2,4-D (2,4-Dichlorophenoxyacetic acid)

Dicamba

Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)

MCPA

MCPP

Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)

2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)

Pentachlorophenol

-
1. Samples shall be filtered prior to performing dissolved inorganics analysis.
 2. Unknown chromatographic peaks shall be reported, along with an estimate of the concentration of the unknown analyte.