

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER NO. R5-2006-0044

WASTE DISCHARGE REQUIREMENTS  
FOR  
BERRYESSA GARBAGE SERVICE, INC.  
STEELE CANYON LANDFILL  
CLASS III LANDFILL  
POST-CLOSURE MAINTENANCE  
AND CORRECTIVE ACTION  
NAPA COUNTY

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

1. Berryessa Garbage Service, Inc. (hereafter referred to as “Discharger”) owns and operates the Steele Canyon Landfill, an inactive Class III landfill on Steele Canyon Road approximately one mile northeast of Moskowite’s Corner on State Highway 128, as shown in Attachment “A”, which is incorporated herein and made part of this Order by reference. The landfill is on a 20-acre site in the southwest ¼ of Section 15, T7N, R3W, MDB&M, corresponding to Assessor Parcel Number 032-140-046.
2. The 10-acre facility includes two unlined landfill units, a borrow area, a storm water collection pond, drainage facilities, access roads, and a bin storage area, as shown in Attachment "B", incorporated herein and made part of this Order by reference. The landfill units include a 1.2-acre older fill area on the west side of the site (Landfill 1), and a 7.4-acre landfill unit in the central part of the site (Landfill 2). Both landfills are unlined and neither has a leachate collection and recovery system.
3. The facility operated from the early 1960s until 1993, accepting primarily household and commercial wastes from residences and resorts along the western shore of Lake Berryessa. The facility stopped accepting wastes on 1 March 1993 but was not closed. Since 1993, refuse from the area has been disposed of at the Potrero Hills Landfill in Solano County.
4. Previous WDRs Order No. 96-130, issued prior to initiation of landfill closure, no longer adequately describes the facility.
5. 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 or 27 CCR). These WDRs implement Title 27 regulations and prescribe updated requirements for performing post-closure maintenance and corrective action monitoring of the landfill.

6. On 9 October 1991, the United States Environmental Protection Agency (USEPA) promulgated regulations (Title 40, Code of Federal Regulations, Parts 257 and 258, "federal municipal solid waste (MSW) regulations" or "Subtitle D") that apply, in California, to dischargers who own or operate Class II or Class III landfill units at which MSW is discharged. The majority of the federal MSW regulations became effective on the "Federal Deadline", which was 9 October 1993. The landfill is subject to all federal Subtitle D regulations because it accepted MSW and does not qualify for any available exemptions. The landfill does not qualify for the limited exemption applicable to facilities that ceased accepting wastes prior to 9 October 1993 per 40 CFR 258.1(d) because it did not close within the following six-month period as required for the exemption. The landfill also does not qualify for the small landfill (i.e., less than 20 tons per day) exemption per 40 CFR 258.1(f)(1) because there is evidence of groundwater impact from the unit.

#### **WASTES AND UNIT CLASSIFICATION**

7. The landfill accepted solid wastes defined as "inert" and "nonhazardous solid waste" under 27 CCR Sections 20230 and 20220, respectively. The landfill was not authorized to accept hazardous or liquid wastes and a 1990-91 Solid Waste Assessment Test (SWAT) investigation found no evidence of hazardous waste impacts at the site.
8. The facility accepted approximately 4.7 tons (17 cubic yards) per day of waste, consisting of about 50 percent household waste, 45 percent commercial waste, and 5 percent demolition wastes. No special wastes were accepted at the landfill. It is estimated that about 85,000 cubic yards (23,375 tons) of wastes were discharged to the facility. The maximum thickness of waste is estimated to be about 40 feet (in the middle deck area of the main fill between 935 to 975 feet above MSL).
9. Both landfills (LFs-1 and 2) are existing, reclassified Class III waste management units under 27 CCR Section 20080(d), since they operated prior to 27 November 1984. LF-1 is an inactive unit under Section 20080(g) because it ceased accepting wastes prior to 27 November 1984.

#### **SITE DESCRIPTION**

10. The landfill was constructed in a ravine in low rolling hills along the eastern edge of the Capell Valley, about one half mile west of Wragg Ridge. The average site elevation is about 965 feet above mean sea level (MSL).
11. Land within 1,000 feet of the site area is generally used for farming, vineyards and cattle grazing. Natural vegetation in the area consists primarily of annual grasses and scattered oak trees.
12. Residences and businesses in the landfill vicinity are supplied by domestic wells. It is estimated that there are approximately 24 supply wells within a one mile radius of the site based on information in the files, including 19 domestic wells, 5 agricultural supply wells and one industrial well. No supply wells are known to exist within 1,000 feet down gradient of the landfill, but there are 2 private domestic wells about 900 feet north of the landfill. The total depth of these wells ranges from about 60 to 440 feet, and averages about 160 feet.

Well yields range from about 1.5 to 25 gallons per minute (gpm) for the domestic wells and from about 10 to 60 gpm for the agricultural wells.

13. The site is not within a 100-year floodplain.

#### **SURFACE AND STORM WATER**

14. The site area is drained by an unnamed creek (in the adjacent ravine to the southwest), which flows to Oak Moss Creek, tributary to Capell Creek, and thence Lake Berryessa.
15. *The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition* designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.
16. The beneficial uses of Lake Berryessa and its tributaries are municipal and domestic supply; agricultural supply; hydropower generation (potential use); water contact and non-contact water recreation; cold freshwater habitat; warm freshwater habitat; spawning, reproduction and/or early development (warm water only); and wildlife habitat.
17. The 100-year, 24-hour precipitation event is 5.8 inches as determined from Rainfall Depth Duration Frequency data provided by the State Department of Water Resources for the Markeley Cove Station. The data indicates that the 2-year, 24-hour precipitation event at the station is about 2.6 inches.

#### **GEOLOGY**

18. The regional geology consists of a faulted ridge-valley system that includes the Capell Valley, an alluvial trough, to the west; Wragg Ridge, a faulted block of marine sedimentary rock, to the east; and rolling hills in between. The geology includes metamorphic, sedimentary and igneous rocks. The soil in the area is generally Bressa-Dibble Complex, an upland range soil formed from weathered sandstone and shale.
19. Boring logs from the site show up to 9 feet of soil overlying bedrock, typically consisting of clayey sand (SC) or silt (ML) under the Unified Soil Classification System. The underlying bedrock is a complex mixture (or "mélange") of Jurassic Age metasedimentary deposits of the Franciscan formation, including sandstone, shale, greenstone, chert, and conglomerates. The formation does not have geologic structures such as strike, dip and bedding planes, but is weathered and fractured. Adjacent to the site to the west are Late Jurassic to Early Cretaceous Age alluvial sedimentary deposits of the Great Valley Sequence (i.e., mudstones, sandstones and conglomerates). Outcrops of ultramafic igneous rocks such as serpentine are also common in the area.
20. There are no known Holocene faults within 1000 feet of the facility. The closest active fault is the Hunting Creek/Berryessa Fault within 1 mile of the site. Additional faults include the Concorde-Green Valley fault about 6 miles southwest of the site and West Napa fault, about 10 miles southwest of the site. The maximum probable earthquake (MPE) and peak bedrock acceleration values for the site have not yet been determined but will be included in the slope stability report (described in Finding 31) required under Provision G.10 of this Order.

**GROUNDWATER**

21. The beneficial uses of the ground water are municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply.
22. The depth to groundwater at the site ranges from about 5 to 15 feet below ground surface (bgs) depending on surface location. Groundwater elevations range from about 1,000 feet above MSL on the upgradient perimeter of LF-2 to about 890 feet above MSL on the downgradient perimeter of LF-2, plus or minus 3 feet of seasonal variation. The groundwater gradient averages about 0.1 ft/ft to the southwest. The minimum separation between the base of the landfill and historical high groundwater is estimated to be 5 feet or less, based on information the 1990 SWAT proposal prepared by McLaren.
23. Four groundwater monitoring wells, MWs-6 through 9, were installed at the site in 1991 as part of the 1990-91 SWAT investigation (December 1991 *Berryessa Garbage Service, Inc., Solid Waste Water Quality Assessment Test Report*, prepared by James C. Hanson). MW- 6 was installed upgradient of LF-1, MW-7 upgradient of LF-2, MW-8 downgradient of both units, and MW-9 downgradient of LF-2. MW-8 monitors groundwater flows from both units while MW-9 monitors only LF-2. Five previously installed shallow monitoring wells (MWs- 1 and 5) were abandoned due to lack of a seal.
24. Historical groundwater monitoring data shows a release from the landfill consisting of general minerals, as follows:

<i>Constituent</i>	<i>Concentration Range, mg/L<sup>1</sup></i>		
	Upgradient MW-7	Downgradient MW-8      MW-9	
Specific Conductance, µmhos/cm <sup>2</sup>	405 – 956	946 - 2,690	747 – 3,600
Total Dissolved Solids	540 - 880	1,100 - 1,300	780 - 1,700
Chloride	13 - 35	510 - 860	30 – 190
Sulfate	< 2	3 - 12	50 - 450
Hardness as CaCO <sub>3</sub>	89 - 520	190 - 380	300 - 650

1. Based on monitoring data from 1999 to 2005, except where noted.  
 2. Based on monitoring data from 1990 to 2005.

25. Time series plots do not show any clear rising or falling trends, except for chloride and sulfate in MW-9, which have recently been detected closer to background concentrations.
26. Monitoring and Reporting Program (MRP) Order No. R5-2006-0044 requires that the Discharger perform corrective action monitoring to monitor the release and the progress of corrective action.
27. Leachate seeps have been historically detected along the landfill deck slopes and toe areas. During the active period the Discharger operated an unlined pond at the landfill toe to collect leachate seepage. The ½-acre-foot pond was constructed by damming the toe area of the ravine with an earthen berm. The amount of leachate collected in the pond was not measured

but is described as being small. Pond monitoring data collected since 1990 shows specific conductance in concentrations ranging from 125 to 5,600  $\mu\text{mhos/cm}$ , indicating that the liquid was likely a mixture of leachate, storm water runoff and possibly groundwater. Generally lower concentrations of specific conductance, ranging from 125 to 925  $\mu\text{mhos/cm}$ , have been detected in the pond liquid since 2002. The occurrence of leachate seeps has also been reduced to negligible levels. These improvements appear to be attributable to construction of the landfill cover and drainage controls, which have reduced leachate generation and increased storm water runoff to the pond. As a result of the improvement in quality of liquid collected in the pond, the pond is now considered primarily a storm water collection pond, but is still required to be monitored for leachate constituents as part of corrective action monitoring (see Finding 32 and Section E.3 of the MRP).

### LANDFILL CLOSURE

28. Previous WDRs required the Discharger to submit a Final Closure Plan (FCP) to comply with Chapter 15 (now Title 27) regulations, and a corrective action plan to address the groundwater impacts and historically-detected leachate seeps. In 1996, after completing a site investigation (see Information Sheet), the Discharger submitted a work plan intended as both a FCP and a corrective action plan (July 1996 *Workplan for Preliminary Closure Construction Activities*, prepared by Emcon). The work plan proposed phased closure of the landfill over a seven-year period, including a prescriptive cover design, as follows:
- a. Foundation Layer – 2 feet of compacted soil
  - b. Low Hydraulic Conductivity (LHC) Layer – 1 foot of compacted clay ( $k \leq 1 \times 10^{-6}$  cm/sec)
  - c. Erosion Resistant Layer – 1 foot of clean vegetative cover soil
  - d. Vegetative Cover – native grass mix

Board staff approved the work plan on 1 July 1996, indicating that it would be construed as a FCP upon approval of the construction plans for the first phase, and as an amended FCP thereafter as each phase is proposed and approved.

29. The Discharger subsequently implemented closure of the landfill under the amended FCP as follows:

<u>Phase</u>	<u>Area</u>	<u>Acres</u>	<u>Construction Year</u>
1. Crest		1.0	1996
2. Crest slopes		0.8	2000
3. Middle deck slopes		1.2	2001
4. Middle deck		1.8	2002
5. Lower deck (except northern tip)		2.4	2003
6. Old fill area (north half)		0.8	2004
7. Old fill area (south half), and Lower deck - northern tip		0.5 <u>0.1</u>	2005 2005
	Total Area:	8.6	

Board staff approved certification reports submitted by the Discharger after construction of the each phase, including the certification report for the final closure phase (Phase 7), submitted on 3 April 2006. The final phase (Phase 7) certification report was approved subject to submission and approval of an acceptable slope stability report, as required under Provision G.10 of this Order.

#### Slopes

30. The LF-2 crest was constructed with a 3 percent minimum slope. Cover elevations at LF-2 range from about 900 feet MSL along the toe to about 1,013 feet MSL at the crest, based on the first post-closure aerial topographic survey conducted in February 2006. The steepest final cover slopes, about 4:1 horizontal-to-vertical, were constructed along the toe of LF-2.
31. A Section 21750(f)(5) technical report demonstrating the stability of the landfill cover slopes was required for this facility since, pursuant to Section 21090(a)(6), closure Phases 2 through 7 were constructed after July 18, 1997, and no slope stability report was previously submitted or approved for the landfill. The Discharger has not submitted this report. Provision G.10 therefore requires that the Discharger submit the slope stability report as an addendum to the Final Closure Plan/Post-Closure Maintenance Plan (FCP/PCMP).

#### Drainage

32. Precipitation and drainage controls for the landfill include diversionary and perimeter ditches around both units, overside drains, culverts, and a storm water collection pond at the foot of LF-2 (former leachate collection pond), as shown in Attachment B. All drainage facilities have sufficient capacity to accommodate a 24-hour, 100-year storm event, except for the storm water pond, which during the wet season, occasionally overflows to the perimeter ditch along Steele Canyon Road. Discharge Specification B.3 requires that the Discharger monitor storm water runoff from the site, including overflows from the pond, in accordance with MRP No. R5-2006-0044 and the State Water Resources Control Board General Industrial Storm Water Permit, Water Quality Order No. 97-03-DWQ. The landfill drainage facilities are described further in the Information Sheet attached to this Order.

Landfill Gas

33. There are not currently any landfill gas (LFG) monitoring wells at the site and concentrations of methane in the landfill gas have not yet been determined. Reporting Requirement F.4 of these WDRs requires that the Discharger provide a semiannual assessment of the effectiveness of corrective action, including an evaluation as to whether landfill gas may be a source of groundwater impacts at the site and whether LFG controls may be necessary as a corrective action measure.

**COST ESTIMATES AND FINANCIAL ASSURANCES**

34. The Discharger has not yet submitted a Post-Closure Maintenance Plan (PCMP), including cost estimates, as required under 27 CCR Section 21769(c). Provision G.9 of these WDRs requires that the Discharger submit a PCMP.
35. The amended FCP included cost estimates of \$524,000 in 2005 dollars (\$459,200 in 1998 dollars) for the cost of landfill closure. The Discharger provided \$90,000 in 1998 dollars (\$101,065 in 2005 dollars) in the form of a Letter of Credit toward this estimate but was not able to fund the full amount as required under 27 CCR Section 22205(b). The CIWMB did not approve the FCP for this reason and the Discharger proceeded with phased closure using available monies collected each year from garbage collection fees (see attached Information Sheet). No funds were released or drawn under the Letter of Credit. The ultimate cost of landfill closure (i.e., Phases 1 through 7) was approximately \$550,000 in 2005 dollars.
36. The Discharger is required to demonstrate financial assurances for post-closure maintenance to the California Integrated Waste Management Board (CIWMB) pursuant to 27 CCR Section 22210(b), since the landfill operated after January 1, 1988. The Discharger has not provided these financial assurances, nor provided a PCMP with cost estimates as noted in Finding 34. Provision G.9 of these WDRs requires that the Discharger submit a PCMP, including updated post closure cost estimates for maintenance and monitoring. Provision G.11 requires that the Discharger provide post closure financial assurances to the CIWMB in an amount approved by the CIWMB in consultation with the Regional Board per 27 CCR Section 20950(f).
37. The Discharger is required to demonstrate financial assurances for corrective action to the CIWMB pursuant to Section 22220(b), since the landfill was operated after July 1, 1991. The Discharger has not provided these financial assurances. Provision G.9 of these WDRs requires that the Discharger include cost estimates for further corrective action in the PCMP, while Provision G.13 requires that the Discharger provide corrective action financial assurances to the CIWMB in an amount approved by the CIWMB in coordination with the Regional Board per 27 CCR Section 22221(a).

**CEQA AND OTHER CONSIDERATIONS**

38. The action to revise the WDRs 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 for existing facilities.

39. Section 13267(b) of California Water Code provides that: “In conducting an investigation specified in subdivision (a), the Regional 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 (MRP No. R5-2006-0044, attached) is necessary to assure compliance with these WDRs. The Discharger owns and operates the facility that discharges the waste subject to this Order.
40. 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 MSW landfills that is consistent with the federal MSW regulations promulgated under Title 40, Code of Federal Regulations, Part 258 (Subtitle D). Title 27 incorporates *State Water Resources Control Board (SWRCB) Resolution No. 93-62*.
41. This order implements:
  - a. *The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition;*
  - b. Chapters 1 through 7, Subdivision 1, Division 2, Title 27, of the California Code of Regulations, effective 18 July 1997, and subsequent revisions;
  - c. The prescriptive standards and performance criteria of RCRA Subtitle D, Part 258; and
  - d. State Water Resources Control Board Resolution No. 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*, adopted 17 June 1993.

#### **PROCEDURAL REQUIREMENTS**

42. 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.
43. The Regional Board notified the Discharger and interested agencies and persons of its intent to prescribe WDRs for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
44. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.
45. 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.waterboards.ca.gov/water\\_laws/index.html](http://www.waterboards.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. 96-130 is rescinded, and that the Berryessa Garbage Service, Inc., 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. DISCHARGE PROHIBITIONS**

1. The discharge of new or additional waste to the landfills at this facility is prohibited.
2. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.
3. The discharge of treated or untreated wastewater 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.
4. The landfill shall not cause pollution or a nuisance, as defined by the California Water Code, Section 13050, and shall not cause degradation of any water supply.
5. 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.

**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 monitored in accordance with MRP No. R5-2006-0044 and the State Water Resources Control Board General Industrial Storm Water Permit, Water Quality Order No. 97-03-DWQ.
4. A minimum separation of five feet shall be maintained between wastes or leachate and the highest anticipated elevation of underlying groundwater per 27 CCR Section 20240(c).

### C. POST-CLOSURE SPECIFICATIONS

1. Construction documents for non-routine landfill cover repairs, precipitation and drainage control system repairs, and corrective action measures shall be submitted in accordance with the following schedule:

<u>Item/Activity</u>		
a.	Submit design plans, specifications, and/or CQA plan, as applicable	At least 2 months prior to starting construction
b.	Submit as-built plans, CQA report and/or certification report, as applicable:	Within 2 months after completion of each construction

All construction documents referenced above shall be certified by a California registered civil engineer or a certified engineering geologist in accordance with the April 2000 Standard Provisions and Reporting Requirements and applicable Title 27 sections (e.g., 27 CCR Sections 20323, 20324, and 21090(h)).

2. Areas with slopes greater than ten percent, surface drainage courses, and areas subject to erosion by wind or water shall be maintained to prevent such erosion.
3. All final cover slopes shall be capable of withstanding a maximum probable earthquake.
4. The final cover shall be graded and maintained to prevent ponding, promote lateral runoff, and prevent soil erosion due to high run-off velocities.
5. The erosion-resistant layer shall be maintained with native or other vegetation capable of providing effective erosion resistance. The vegetation shall not have a rooting depth greater than the erosion-resistant layer thickness.
6. Precipitation and drainage control systems shall be designed, constructed, operated and maintained to convey peak flows from a 100-year, 24-hour storm event.
7. The closed landfills shall be maintained to prevent, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, and washout.
8. The Discharger shall conduct an aerial survey of the site every five years for the purpose of updating the landfill topographic map to track differential settlement.
9. 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.
10. The post-closure maintenance period shall continue until the Regional Board finds that remaining waste in the landfill will not threaten water quality. Such finding by the Regional Board shall release the discharger only from the need to comply with the SWRCB-promulgated portions of Title 27 and not necessarily from the requirements of other state agencies (including the agents of such agencies) such as the CIMWB and Local Enforcement Agency.

#### **D. FACILITY SPECIFICATIONS**

1. 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.
2. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the WDRs. All storm water controls, including drainage facilities, shall be maintained so that they function effectively during precipitation events.
3. 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.
4. All wells within 500 feet of the waste management units shall have sanitary seals that meet the requirements of the Napa County Environmental Management Department 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.

#### **E. MONITORING SPECIFICATIONS**

1. The Discharger shall conduct groundwater and surface water monitoring, as specified in MRP No. R5-2006-0044. Groundwater monitoring shall include background monitoring and corrective action monitoring. Background monitoring shall be conducted for the purpose of establishing concentration limits as part of the Water Quality Protection Standard per 27 CCR Section 20400(a). Corrective action monitoring shall be conducted for the purpose of assessing the nature and extent of the release, designing corrective action measures, and for assessing the progress of corrective action (Section 20430(d)).
2. The Discharger shall provide the Regional Board a minimum of one-week notification prior to commencing any field activities related to the installation, non-routine repair, or abandonment of monitoring devices. The Discharger shall also provide the Regional Board with a sampling schedule at least 48 hours prior to initiation of each detection,

evaluation, or corrective action monitoring event conducted pursuant to MRP No. R5-2006-0044.

3. The Discharger shall comply with the Water Quality Protection Standard as specified in MRP No. R5-2006-0044 and the SPRR.
4. The concentrations of the constituents of concern in waters passing the Point of Compliance shall not exceed concentration limits established in accordance with MRP No. R5-2006-0044. Reporting Requirement F.4 of these WDRs requires that the Discharger provide a semiannual assessment as to the progress of corrective action toward returning to compliance with this specification as part of the Water Quality Protection Standard.
5. The Discharger shall maintain and implement a Sample Collection and Analysis Plan that includes the following elements:
  - 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; Sample quality assurance/quality control (QA/QC) procedures; and
  - d. Chain of Custody control.
6. 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 a longer time period is approved, and shall be taken in a manner that ensures sample independence to the greatest extent feasible.
7. 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 sampling plan.
8. If methods other than USEPA-approved methods or Standard Methods are used, the exact methodology shall be submitted for review and approval prior to use.
9. The methods of analysis and the detection limits used must be appropriate for the expected concentrations. For the monitoring of any constituent or parameter that is found in concentrations which produce more than 90% non-numerical determinations (i.e., "trace" or "ND") in data from background monitoring points for that medium, the analytical method having the lowest method detection limit (MDL) shall be selected

from among those methods which would provide valid results in light of any matrix effects or interferences.

10. "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.
11. 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.
12. 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.
13. Unknown chromatographic peaks shall be reported, along with an estimate of the concentration of the unknown analyte. When unknown peaks are encountered, second column or second method confirmation procedures shall be performed to attempt to identify and more accurately quantify the unknown analyte.
14. All QA/QC data shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and qualifications of the person(s) performing the analyses. Sample results shall be reported unadjusted for blank results or spike recoveries. In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged.

#### **MONITORING DATA ANALYSIS**

15. All monitoring data analysis methods shall be consistent with the performance standards specified in 27 CCR Section 20415(e)(9) and sampling standards specified in Section 20415(e)(12).
16. The statistical method shall account for data below the practical quantitation limit (PQL) with one or more statistical procedures that are protective of human health and

the environment. Any PQL validated pursuant to 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 Section 20415(e)(7), 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 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".

17. 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 background and corrective action monitoring, or an alternate statistical method approved by the Executive Officer in accordance with 27 CCR Section 20415(e)(8)(E), to establish concentration limits pursuant to Section 20400. The Discharger shall conclude that any analyte that exceeds its concentration limit provides a preliminary indication [or, for a retest, provides measurably significant evidence] of a release at that monitoring point. Any COC confirmed by retest as part of a release shall be added to the monitoring parameter list such that it is monitored during each regular monitoring event. The statistical method shall take into account any seasonality in the groundwater quality data.
18. 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 determining concentration limits and detecting a release. 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 a release (existing or new) at that monitoring point, if the data contains an analyte that exceeds its PQL.

Any COC confirmed by retest as part of a release shall be added to the monitoring parameter list such that it is monitored during each regular monitoring event.

19. For VOCs and other organic COCs (i.e., non-naturally occurring COCs) the Discharger shall use a nonstatistical data analysis method for determining concentration limits and detecting a release. 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 a release (existing or new) 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 COC confirmed by retest as part of a release shall be added to the monitoring parameter list such that it is monitored during each regular monitoring event.

#### Discrete Retest

20. If the above statistical or non-statistical trigger procedures used for groundwater monitoring data analysis provide a preliminary indication of a new release or a previously unconfirmed constituent of the existing release at a given monitoring point, the Discharger shall immediately notify the Regional Board 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., 17 for statistical constituents, 18.a or 19.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 (17, 18.a or 19.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 21, below.

Exceedances that the Discharger demonstrates (per 27 CCR Section 20420(k)(7)) 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. Exceedances for any other constituents for which the Discharger fails to conduct a retest will be considered confirmed without retest. Exceedances for constituents that have been previously confirmed as part of the release at a given monitoring point, including regularly detected COCs and COCs that are

sporadically detected (e.g., as a result of seasonal or lateral fluctuations in the plume), shall be considered confirmed without notification and retest.

21. 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 Section XI, RESPONSE TO RELEASE, April 2000 SPRR.
22. The data analysis methods shall also include trend analysis using time series plots and an evaluation of the water chemistry by appropriate methods (e.g., Piper diagram, 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 shall be at least 4 historical data points above 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. R5-2006-0044, and in the April 2000 SPRR.
2. 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)

3. 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.

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.”

4. The Discharger shall submit semiannual corrective action progress reports in accordance with MRP No. R5-2006-0044 and 27 CCR Section 20430. Each progress report shall address the following issues:
  - a. The source of the impact (e.g., leachate, waste constituents in landfill gas, inadequate groundwater separation)
  - b. The nature and extent of the release.
  - c. Whether the size of the plume and concentrations of constituents within have increased, decreased or have not changed.
  - d. The effectiveness of landfill closure as a corrective action.
  - e. The need for additional corrective action measures (e.g., landfill gas controls) and/or monitoring wells.

The reports shall include plans for the installation any additional monitoring wells necessary to define the extent of the release and/or monitor the progress of corrective action.

5. 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 SPRR (Reporting Requirement 4) 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.

6. 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.
7. 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 WDRs.
8. 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.

## **G. PROVISIONS**

1. The Discharger shall maintain a copy of this Order at the facility and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.
2. The Discharger shall comply with all applicable provisions of Title 27 and 40 Code of Federal Regulations Part 258 (Subtitle D) that are not specifically referred to in this Order.
3. The Discharger shall comply with the Monitoring and Reporting Program No. R5-2006-0044, which is attached to and made part of this order. A violation of the MRP is a violation of these WDRs.
4. The Discharger shall comply with the April 2000 Standard Provisions and Reporting Requirements (SPRR), which are hereby incorporated into this Order. The SPRR contain important provisions and requirements with which the Discharger must comply. A violation of any of the SPRR is a violation of these WDRs.
5. 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.

6. The owners of the waste management facility shall have the continuing responsibility to assure protection of usable waters from discharged wastes and from gases and leachate generated by discharged wastes during the closure and post-closure maintenance period of the landfill and during subsequent use of the property for other purposes.
7. 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.
8. 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:
    - 1) Source control,
    - 2) Adequate separation from groundwater,
    - 3) Groundwater cleanup, and/or
    - 4) 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.
9. The Discharger shall, by **31 July 2006**, submit a Post-Closure Maintenance Plan (PCMP) that reflects current operations and requirements under these WDRs and MRP No. R5-2006-0044. The PCMP shall contain all information required under 27 CCR Section 21769(c), including, but not limited to, updated cost estimates for post-closure maintenance and monitoring. The updated PCMP shall be submitted to the Regional Board, the Local Enforcement Agency, and the CIWMB.
10. By **31 July 2006**, the Discharger shall, pursuant to 27 CCR Sections 21090(a)(6) and 21750(f)(5), submit a technical report demonstrating the stability of the landfill cover slopes. The report shall be submitted as an addendum to the FCP/PCMP, and the landfill shall not be considered closed until this report is submitted and approved.
11. The Discharger shall obtain and maintain assurances of financial responsibility for post-closure maintenance costs in the amount of the cost estimates in the updated post-closure maintenance plan, as approved. The Discharger shall submit a proposed

financial assurance mechanism for closure and post-closure maintenance meeting the requirements of Chapter 6, Title 27 to the Financial Assurances Section of the CIWMB. If the CIWMB determines that either the amount of coverage or the mechanism is inadequate, then within 90 days of notification, the Discharger shall submit an acceptable mechanism for at least the amount of the approved cost estimate.

12. The Discharger shall establish cost estimates for initiating and completing corrective action for all known or reasonably foreseeable releases from the landfill, and submit these estimates for review and approval.
13. The Discharger shall 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 Regional Board per 27 CCR Section 22221(a). Upon approval of the cost estimate, the Discharger shall submit the financial assurance mechanism for the approved amount to the Financial Assurances Section of the CIWMB per Chapter 6, Title 27. If the CIWMB determines that either the amount of coverage or the mechanism is inadequate, then within 90 days of notification, the Discharger shall submit an acceptable mechanism for at least the amount of the approved cost estimate.
14. The Regional Board will review this Order periodically and will revise these requirements when necessary.

I, PAMELA C. CREEDON, 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 5 May 2006.

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PAMELA C. CREEDON, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER NO. R5-2006-0044  
MONITORING AND REPORTING PROGRAM  
BERRYESSA GARBAGE SERVICE, INC.  
STEELE CANYON LANDFILL  
CLASS III LANDFILL  
POST-CLOSURE MAINTENANCE  
AND CORRECTIVE ACTION  
NAPA COUNTY

This monitoring and reporting program (MRP) incorporates requirements for post-closure maintenance and corrective action monitoring of the landfill. This MRP is issued pursuant to Water Code Section 13267. Compliance with this MRP is ordered by Waste Discharge Requirements (WDRs) Order No. R5-2006-0044. The Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Executive Officer.

Pursuant to Title 27, California Code of Regulations (27 CCR) Sections 20080(d)(1) and 20080(g), the Discharger shall maintain water quality monitoring systems for background and corrective action monitoring.

**A. SUMMARY OF MONITORING & REPORTING FREQUENCIES**

**Table A**

<i>Section</i>	<i>Reporting:</i>	<i>Frequency</i>
B.	Periodic Reports:	
	1. Semiannual Report	Semiannually
	2. Annual Monitoring Summary Report	Annually
	3. Constituents of Concern Report (Attachment D)	Every 5 years
C.	Water Quality Protection Standard Report	Update as necessary
	<i>Monitoring:</i>	
D.	Leachate Monitoring	
	1. Seeps	
	A. Wet Season	Monthly
	B. Dry Season	Quarterly
E.	Groundwater Monitoring:	
	1. Elevation	Quarterly
	2. Background & Corrective Action Monitoring	See Table E.3
	3. Constituents of Concern	Every 5 years
F.	Facility Monitoring:	
	1. Standard Observations	
	A. Wet Season (October 1 – April 30)	Monthly
	B. Dry Season (May 1 – September 30)	Quarterly
	2. Maintenance Inspections	Quarterly
	3. After Significant Storm Events	Within 7 Days After Event
	4. Site Winterization	Annually
G.	Surface Water Monitoring:	Semiannually

## **B. REPORTING**

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required under Order No. R5-2006-0044 and the April 2000 Standard Provisions and Reporting Requirements (SPRR). Reports shall be submitted semiannually, annually and every five years, as outlined below.

### **1. Schedule**

Monitoring reports shall be submitted to the Board in accordance with the following schedule for the calendar period in which samples were taken or observations made:

**Table B**

<u>Report</u>	<u>End of Reporting Period</u>	<u>Date Report Due</u>
First Semiannual	30 June	<b>31 July</b>
Second Semiannual	31 December	<b>31 January</b>
Annual Report	31 December	<b>31 January</b>
5-Year COC Report	31 December 2006 and every 5 years thereafter	<b>31 January 2007 and every 5 years thereafter</b>

### **2. Semiannual Reports**

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 sampling dates, well/monitoring point, constituents, concentrations, and concentration limits. The table 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/monitoring point, 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.
- I. An electronic copy of the data in a digital format acceptable to the Executive Officer.

### **3. Annual Monitoring Summary Report**

An Annual Monitoring Summary Report (Annual Report) shall be prepared and submitted in accordance with this section of the MRP and Reporting Requirement H.4 herein. 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 (e.g., TDS and 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.

The Annual Report may be included in the Second Semiannual Report for each year. The 2006 Annual Report shall include a copy of the Sample Collection and Analysis Plan (sampling plan) referenced under WDR Monitoring Specification E.5.

#### 4. Five-Year COC Reports

Same information as semiannual reports for all COCs listed in Attachment D.

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 WDRs.

### 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)

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

<b>Table C</b>		
<b>Constituents of Concern</b>	<b>Units</b>	<b>Test Method</b>
Field Parameters:	See Attachment D	
General Minerals:	See Attachment D	
Inorganics (dissolved)	µg/L	See Attachment D
Volatile Organic Compounds	µg/L	USEPA Method 8260B
Semi-Volatile Organic Compounds	µg/L	USEPA Method 8270
Organophosphorus Pesticides	µg/L	USEPA Method 8141A
Chlorinated Herbicides	µg/L	USEPA Method 8151
Organochlorine Pesticides	µg/L	USEPA Method 8081A
Polychlorinated Biphenols (PCBs)	µg/L	USEPA Method 8082

#### 2. Concentration Limits (Section 20400)

Concentrations limits shall be developed/updated for groundwater and surface water monitoring parameters and COCs listed in the monitoring schedules herein, as follows:

- 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.17 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/updating concentration 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. Otherwise 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 Sections E.2 and E.3 of this MRP.

**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 the Unit that extends through the uppermost aquifer underlying the Unit. The POC wells for the unit shall be MWs-8 and 9.

**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 Reporting Requirement H.5 of this MRP.

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

At this facility, background groundwater monitoring points shall consist of MW-6 (in the borrow area north of LF-1) and MW-7 (in the borrow area northeast of LF-2) and any future wells installed upgradient of either landfill for background monitoring. The monitoring schedule shall be as specified in Table E.3.

### **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 Sample Collection and Analysis Plan per Monitoring Specification E.5 of the WDRs.

The corrective action monitoring points at this facility shall include MWs-8 and 9, and any 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. Groundwater samples shall be collected and analyzed in accordance with the following schedule:

**Table E.3**  
**Corrective Action Monitoring Schedule**

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>	<u>Monitoring Approach</u>	
			<u>Nature/Extent</u>	<u>Trends</u>
<b>Field Parameters</b>				
Elevation	Feet MSL	Quarterly	---	---
Specific Conductance	µMhos/cm	Semiannually	---	---
pH	pH units	Semiannually	---	---
Temperature	°C	Semiannually	---	---
Turbidity	NTU	Semiannually	---	---
<b>Monitoring Parameters</b> (Attachment C)				
General Minerals:				
TDS	mg/L	Semiannually	Interwell	Intrawell
Chloride	mg/L	Semiannually	Interwell	Intrawell
Sulfate	mg/L	Semiannually	Interwell	Intrawell
Total Alkalinity	mg/L	Semiannually	Interwell	Intrawell
Total Hardness	mg/L	Semiannually	Interwell	Intrawell
Major Anions	mg/L	Annually	Interwell	Intrawell
Major Cations	mg/L	Annually	Interwell	Intrawell
Dissolved Inorganics	µg/L	Every 2½ years <sup>1</sup>	Interwell/Intrawell	Intrawell
VOCs	µg/L	Every 2½ years <sup>1</sup>	Intrawell	Intrawell
<b>Constituents of Concern</b> (Attachment D)		Every 5 years		

1. Monitoring frequency chosen such that every other sampling event coincides with 5-year COC event.

Five-year COC monitoring under this Order shall be conducted by 30 November 2006 and at least every five years thereafter (see Section B.4).

**A. 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.) using major ion and cation data.
  - Preparation of contaminant contour maps for representative constituents of the release.
- c. Effectiveness of Corrective Action
  - Preparation of time series plots for representative constituents
  - Trend analysis for each constituent using appropriate statistical and graphical methods (e.g., Mann-Kendall).
  - 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, as applicable, including a narrative discussion, shall be included in each semiannual report and summarized in the Annual Report, as specified under Section B 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 27 CCR Section 20430(h).

## **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 Reporting Requirement H.3.f herein. Each monitoring report shall include a summary and certification of completion of all Standard Observations. Field logs of standard observations shall also be included in the report.

### **2. Regular Maintenance Inspections**

Landfill facilities (e.g., monitoring wells) shall be inspected **quarterly** to identify the need for maintenance and repairs. 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 2.5 inches or more of precipitation within a 24-hour period, as measured at the Markely Cove 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.

**G. SURFACE WATER MONITORING (Section 20415(c))**

**1. Corrective Action**

The Discharger shall conduct surface water monitoring for the purpose of developing/updating concentration limits and monitoring potential impacts from leachate seeps and/or hydraulic communication with impacted groundwater. The surface water monitoring locations shall be as follows (see Attachment B):

<u>Unit</u>	<u>Surface Water</u>	<u>Monitoring Point</u>	
		Upstream	Downstream
LF-2	Storm water (former leachate collection) pond	---	SW-1
Site	SW ravine creek	SW-5	SW-3

Surface water monitoring shall be conducted for the field and monitoring parameters specified in Table E.3, except for elevation, dissolved inorganic constituents and VOCs. Monitoring frequencies shall also be as listed in Table E.3. COC monitoring shall be required for surface water only if monitoring data analysis (see Monitoring Specifications E.18 through E.20) and/or field observations indicates that a release has occurred (see Section XI.3, RESPONSE TO RELEASE, SPRR; Reporting Requirement F.10 herein). Monitoring data analysis and reporting shall be as specified in Sections B and E.3.A, as applicable to surface water.

**2. Storm Water**

The discharger shall monitor storm water runoff from the site under the State Water Resources Control Board General Industrial Storm Water Permit, Water Quality Order No. 97-03-DWQ (General Permit). The storm water monitoring locations shall, at a minimum, include the following (see Attachment B: Site Map):

<u>Unit</u>	<u>Surface Water</u>	<u>Monitoring Point</u>	
		Upstream	Downstream
LF-1	Perimeter drain	SW-6	SW-2
LF-2	Storm water pond	---	SW-4

The results of storm water monitoring for a given monitoring period shall be reported pursuant to the General Permit and summarized in the monitoring reports submitted under this Order. If there is no discharge from the site during the monitoring period, or the Discharger did not obtain samples of the discharge, the Discharger shall state such facts and circumstances in the monitoring report.

#### **H. REPORTING REQUIREMENTS**

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

Such 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.
2. 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. See also WDR Reporting Requirement F.3.
  3. 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:
  - i. The time of water level measurement;
  - ii. 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;
  - iii. 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;
  - iv. The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and
  - v. A statement that the sampling procedure was conducted in accordance with the approved Sample Collection and Analysis Plan.
- b. A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.
- c. 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:
  - i. For the Unit:
    - 1) Evidence of ponded water at any point on the facility (show affected area on map);
    - 2) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
    - 3) Evidence of erosion and/or of day-lighted refuse.
  - ii. Along the perimeter of the Unit:
    - 1) Evidence of liquid leaving or entering the Unit, estimated size of affected area, and flow rate (show affected area on map);

- 2) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
  - 3) Evidence of erosion and/or of day-lighted refuse.
- iii. For receiving waters:
- 1) Floating and suspended materials of waste origin - presence or absence, source, and size of affected area;
  - 2) Discoloration and turbidity - description of color, source, and size of affected area;
  - 3) Evidence of odors - presence or absence, characterization, source, and distance of travel from source;
  - 4) Evidence of water uses - presence of water-associated wildlife;
  - 5) Flow rate; and
  - 6) Weather conditions - wind direction and estimated velocity, total precipitation during recent days and on the day of observation.
4. 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. All historical monitoring data, including data for the previous year, shall be submitted in tabular form as well as in a digital file format. The Regional Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [Title 27 CCR Section 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 WDRs.
  - 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.
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 Constituents of Concern 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.

See Section XI. RESPONSE TO RELEASE, SPRR.

6. 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. R5-2006-0044 required by Section 13750 through 13755 of the California Water Code.

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

Ordered by: \_\_\_\_\_  
PAMELA C. CREEDON, Executive Officer

5 May 2006

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

## **INFORMATION SHEET{PRIVATE }**

ORDER NO. R5-2006-0044  
BERRYESSA GARBAGE SERVICE, INC.  
STEELE CANYON LANDFILL  
NAPA COUNTY

The 10-acre landfill is on Steele Canyon Road approximately one mile northeast of Moskowitz's Corner on State Highway 128. The facility includes two unlined landfill units, a borrow area, a storm water collection pond, drainage facilities, access roads, and a bin storage area. The facility operated from the 1960s until 1993, accepting primarily household and commercial wastes. The landfill stopped accepting wastes on 1 March 1993 and since then has been operated as a transfer station. The groundwater impacts consist of general minerals such as total dissolved solids (TDS) and chloride. Current groundwater monitoring data shows TDS and chloride up to 1,200 mg/L and 610 mg/L respectively in downgradient compliance wells at the site, compared to upgradient concentrations of 610 mg/L and 30 mg/L.

### **Final Closure Plan**

In 1996 the Discharger conducted a preliminary site investigation to evaluate the cause of historically-detected leachate seeps and to scope closure issues. The report concluded that the seeps were primarily the result of ponding and storm water infiltration resulting from lack of cover and drainage controls (April 1996 *Preliminary Site Investigation Report*, prepared by Emcon). The Discharger subsequently submitted a work plan (July 1996 Workplan for Preliminary Closure Construction Activities, prepared by Emcon) proposing phased closure of the landfill over a seven year period. The work plan was intended as both a Final Closure Plan (FCP) and a corrective action plan. Board staff approved the work plan on 1 July 1996, indicating that it would be construed as a FCP upon approval of the construction plans for the first phase, and as an amended FCP thereafter as each phase is proposed and approved.

The CIWMB did not recognize the work plan as a complete FCP since the Discharger could not provide financial assurances for the total estimated cost of closure in the plan as required under Title 14 (now Title 27) solid waste regulations. The CIWMB approved the technical aspects of the work plan as a corrective action measure, however, allowing the Discharger to proceed with closure on its own (i.e., in the absence of an approved closure plan and without financial assurances) under a Certification of Closure approach. Under this approach, the CIWMB would certify closure of the landfill after all phases were complete, provided that the landfill was closed as proposed.

### **Landfill Closure**

The Discharger initiated the first closure phase in 1996 and completed the final closure phase in December 2005. Board staff approved certification reports submitted by the Discharger after construction of Phases 1 through 6. The final phase (Phase 7) report was approved subject to the requirement that the Discharger submit an acceptable slope stability report, as required under 27 CCR Sections 21090(a)(6) and 21750(f)(5) and this Order. Borrow soil from approved onsite sources was used in the foundation layer and low hydraulic conductivity (LHC) layers. Existing cover soil was also used in the foundation layer. Laboratory tests of the soil used in the LHC

layer indicated that it typically consisted of sandy lean clay (“CL”) and/or fat clay with sand (“CH”) under the Unified Soil Classification System.

#### Post-Closure

The first post-closure aerial survey of the site was conducted in February 2006.

#### Precipitation and Drainage Controls

##### LF-1

A clay-lined diversionary ditch along the northeastern perimeter of the old fill area diverts run-on flows around the landfill, through a culvert under the main access road, and into a corrugated PVC pipe extension of the drain, which conveys the runoff west to the site perimeter ditch along Steele Canyon Road.

##### LF-2

An unlined seasonal stream diverts flows around the northeast end of LF-2 and drains the adjacent northeast slopes of the unit and adjacent borrow area. The drain discharges to an outfall in the southeast corner of the site, which spills down the adjacent ravine slope into an unnamed creek. A northwestern perimeter ditch drains the northwestern slopes of landfill and adjacent hill, while the southeastern ditch drains the southeastern slopes of landfill and run-on flows diverted from the landfill toe. Both perimeter drains have sufficient capacity to accommodate a 24-hour, 100-year storm event. The southeastern drain is eroded to bedrock in most places, but is lined with broken rubble from weathered bedrock that serves as a natural velocity control.

A cover ditch and berm constructed along upper toe slopes of LF-2 diverts flows from the middle deck around toe slopes. Run-on diverted to the west is directed to a corrugated plastic overside drain which discharges to the storm water collection pond near the landfill toe, while run-on diverted to the east flows to the southeastern perimeter ditch.

An unlined storm water collection pond at the toe of LF-2, formerly used to collect leachate seepage from the landfill toe area, is now primarily used to collect and evaporate storm water. The pond receives flows from overside drain, direct runoff from toe slopes and flows from SE perimeter ditch. The pond has a capacity of about 0.5 acre-foot, above which it overflows to the perimeter ditch along Steel Canyon Road. Overflows from the pond are monitored under the MRP of this Order.

#### Surface Water

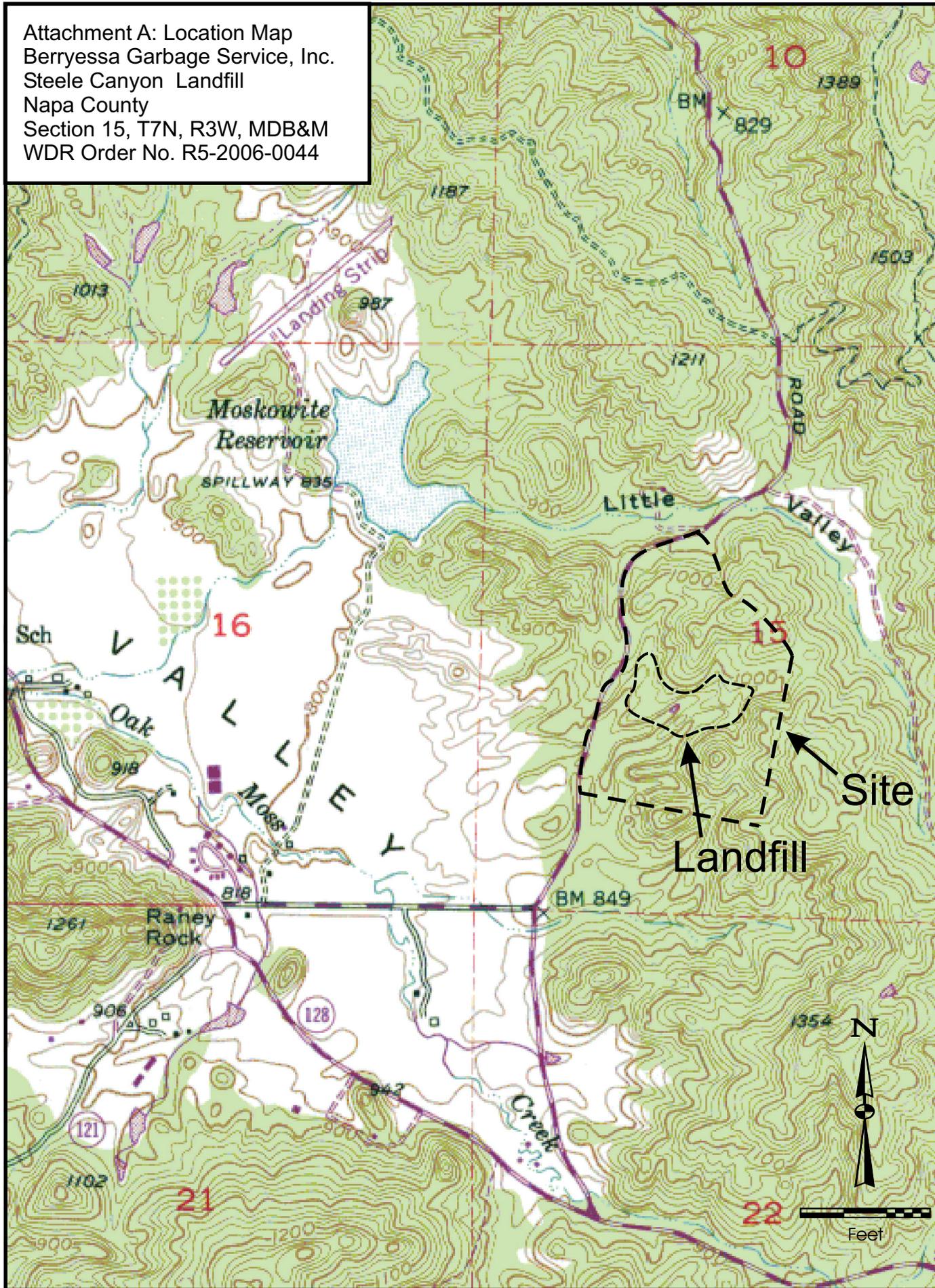
Site drainage, including runoff from LF-1 and the western side of LF-2, flows to a ditch along the along Steele Canyon Road. The ditch ultimately joins the ravine creek about ½ mile down stream of the site, and flows to Oak Moss Creek, tributary to Capell Creek, and thence Lake Berryessa.

ORDER NO. R5-2006-0044  
BERRYESSA GARBAGE SERVICE, INC.  
STEELE CANYON LANDFILL  
NAPA COUNTY

- 3 -

JDM: 5 April 06

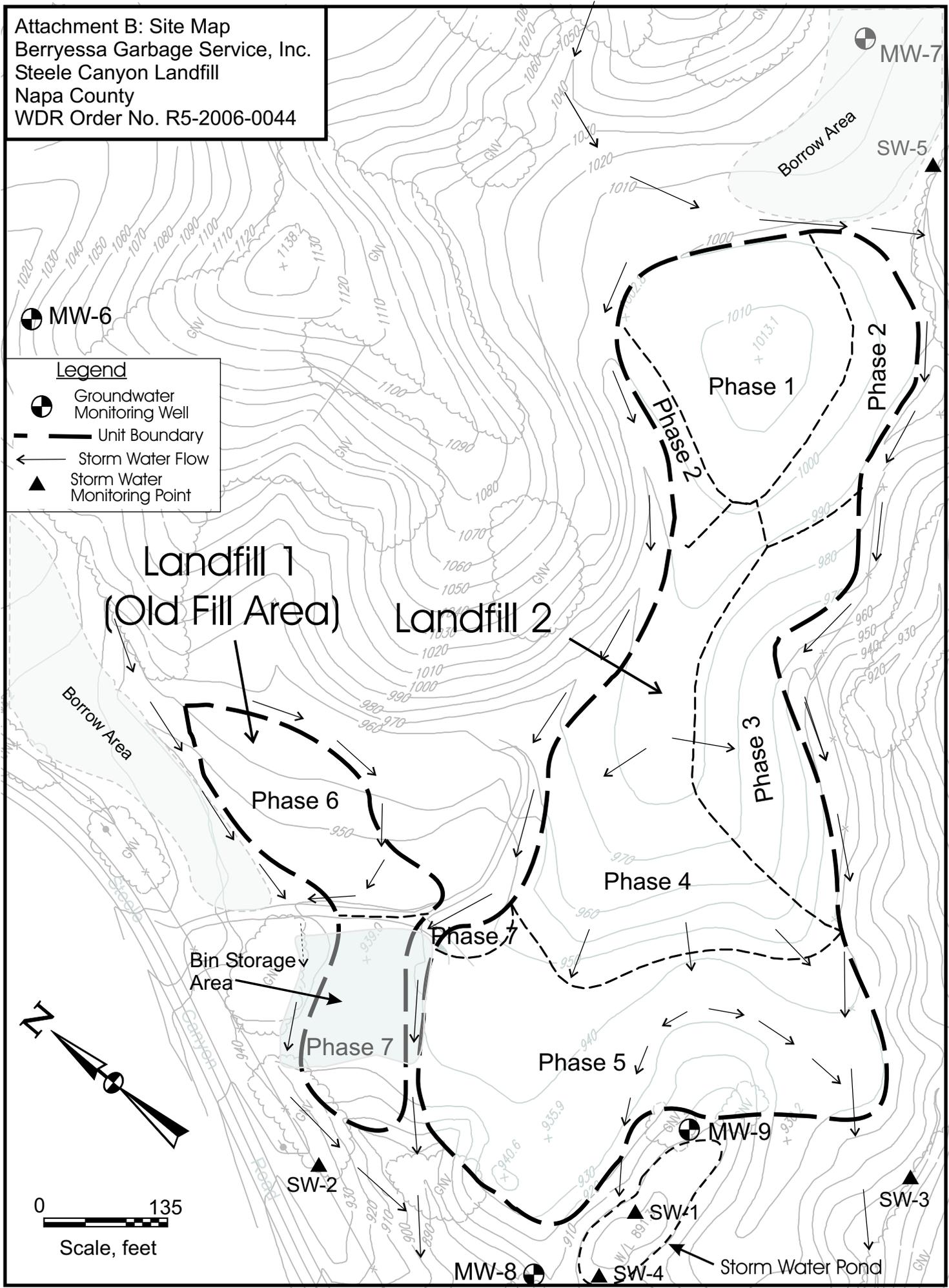
Attachment A: Location Map  
Berryessa Garbage Service, Inc.  
Steele Canyon Landfill  
Napa County  
Section 15, T7N, R3W, MDB&M  
WDR Order No. R5-2006-0044



Attachment B: Site Map  
 Berryessa Garbage Service, Inc.  
 Steele Canyon Landfill  
 Napa County  
 WDR Order No. R5-2006-0044

**Legend**

-  Groundwater Monitoring Well
-  Unit Boundary
-  Storm Water Flow
-  Storm Water Monitoring Point



## ATTACHMENT C

### MONITORING PARAMETERS & APPROVED USEPA ANALYTICAL METHODS

<b>Field Parameters</b>	<b>USEPA Test Method</b>
Groundwater Elevation	----
pH	----
Specific conductance	----
Temperature	----
Turbidity	----

<b>General Minerals</b>	<b>USEPA Test Method</b>
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)
Sulfate	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)

<b>Dissolved Inorganics<sup>1</sup></b>	<b>USEPA Test Method</b>
Antimony	200.7/6010
Arsenic	200.9/200.8
Barium	200.7/6010
Cadmium	200.7/6010
Chromium	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
Nickel	200.9/200.8
Silver	200.7/6010
Zinc	200.7/6010

### ATTACHMENT C (CON'T)

#### **Volatile Organic Compounds<sup>2</sup> (VOCs, by USEPA Method 8260B):**

Acetone  
Acetonitrile  
Acrolein  
Acrylonitrile  
Allyl chloride (3-Chloropropene)  
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)  
1,2-Dichloropropane (Propylene dichloride)  
1,3-Dichloropropane  
2,2-Dichloropropene  
1,1-Dichloropropene  
cis- 1,3-Dichloropropene

**ATTACHMENT C (CON'T)**

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 per WDR Monitoring Specification E.13.

## ATTACHMENT D

### CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

<b>Field Parameters</b>	<b>USEPA Test Method</b>
Groundwater Elevation	----
pH	----
Specific conductance	----
Temperature	----
Turbidity	----

<b>General Minerals</b>	<b>USEPA Test Method</b>
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)
Sulfate	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)

<b>Dissolved Inorganics<sup>1</sup></b>	<b>USEPA Test Method</b>
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
Hexavalent Chromium	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 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 Compounds<sup>2</sup> (VOCs, by USEPA Method 8260B):**

Acetone  
Acetonitrile  
Acrolein  
Acrylonitrile  
Allyl chloride (3-Chloropropene)  
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)  
1,2-Dichloropropane (Propylene dichloride)  
1,3-Dichloropropane

**ATTACHMENT D (CON'T)**

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)

**Semivolatile Organic Compounds<sup>2</sup>** (USEPA Method 8270 - base, neutral, & acid extractables):

Acenaphthene  
Acenaphthylene  
Acetophenone  
2-Acetylaminofluorene (2-AAF)  
4-Aminobiphenyl  
Anthracene

**ATTACHMENT D (CON'T)**

Benzo[a]anthracene (Benzanthracene)  
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  
Fluoranthene  
Fluorene  
Hexachlorobenzene  
Hexachloropropene  
Indeno(1,2,3-c,d)pyrene

**ATTACHMENT D (CON'T)**

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 D (CON'T)**

**Organochlorine Pesticides<sup>2</sup>** (USEPA Method 8081A)

Aldrin  
 $\alpha$ -BHC  
 $\beta$ -BHC  
 $\gamma$ -BHC (Lindane)  
 $\delta$ -BHC  
Chlorobenzilate  
 $\alpha$ -Chlordane  
 $\gamma$ -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 Biphenols<sup>2</sup>** (PCBs, USEPA Method 8082)

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

**Organophosphorus Pesticides<sup>2</sup>** (USEPA Method 8141A):

Chlorpyrifos  
Diazinon  
Dimethoate  
Disulfoton  
Ethion  
Famphur  
Malathion  
Parathion

**ATTACHMENT D (CON'T)**

Parathion-ethyl  
Parathion-methyl  
Phorate

**Chlorinated Herbicides<sup>2</sup>** (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

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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 per WDR Monitoring Specification E.13.