

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION  
TENTATIVE

ORDER NO. R5-2006-0074

WASTE DISCHARGE REQUIREMENTS

FOR  
THE UNITED STATES AIR FORCE  
BEALE AIR FORCE BASE LANDFILLS NO. 2 AND NO. 3  
CLASS III LANDFILLS  
POST-CLOSURE MAINTENANCE  
AND MONITORING  
YUBA COUNTY

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

1. Beale Air Force Base (hereafter Base) is owned and operated by the United States Air Force (hereafter Discharger). The Base is about 10 miles east of Marysville in Yuba County and covers about 23,000 acres as shown in Attachment A, incorporated herein and made part of this Order by reference.
2. Solid waste landfills, Nos. 2 and 3 were previously regulated by Waste Discharge Requirements (WDRs) Order No. 96-015 and prior to that by WDRs Order No. 79-012.

Landfill No. 2 Class III Landfill (Municipal Solid Waste Landfill). This landfill was operated from the early 1950s until 1980 and received photo waste treatment plant sludge, unknown amounts of petroleum/chemical wastes, residential and general base refuse. Dirt, wood, and other inert construction and ground maintenance debris was disposed of from 1980 until the fall of 1993 at the landfill. Landfill No. 2 covers 56 acres and was operated as a trench and fill with 15 to 20-foot deep trenches.

Landfill No.3 Class III Landfill (Municipal Solid Waste Landfill), which accepted refuse from residences and other base activities between 1981 and the fall of 1993. Landfill No. 3 covers about 27 acres. Wastes were discharged to trenches 15 to 25 feet deep, 40 to 60 feet wide at the top, and 600 to 2000 feet in length.

3. Both landfills include access roads, monitoring wells, and drainage facilities as shown in Attachment " B" and " C", incorporated herein and made part of this Order by reference. The landfills are unlined and do not have leachate collection and removal systems.
4. These WDRs implement 40 Code of Federal Regulations (CFR), Parts 257 and 258, or "Subtitle D" because these landfills accepted wastes after the effective date of those regulations, 9 October 1991.

### **WASTES AND UNIT CLASSIFICATION**

5. The landfills accepted solid wastes defined as “inert” and “nonhazardous” under Sections 20230 and 20220 of Title 27, respectively from 1980 until 1993. The landfill was not authorized to accept hazardous or liquid wastes between 1980 and 1993. However, from the 1950s until 1980, Landfill No. 2 accepted wastes as noted in Finding No. 2. that may have been hazardous and/or liquid wastes.

### **GEOLOGY**

6. The geologic setting of the Base includes alluvial and marine shelf sediments overlying metamorphic basement rocks of the Sierra Nevada foothills. The nearest potential active fault is the Dunnigan Hills Fault approximately 36 miles southwest of the site. The fault is estimated to have a maximum expected earthquake magnitude of 6.75, which is estimated to produce a maximum credible acceleration of 0.2 g approximately 18 miles from the site. Rock acceleration at the site due to a magnitude 6.75 earthquake Dunnigan Hills Fault is estimated to be 0.085 g.
7. The Base obtains water from nine water supply wells for base domestic and industrial usage. These Base water supply wells are several miles north and cross gradient from the landfills. The Base water supply wells screen several freshwater-bearing zones to depths of approximately 356 feet below ground surface. These freshwater-bearing zones consist of Quaternary- and Tertiary-aged, fluvially-deposited clay, silt, and gravel beds which dip gently to the southwest

### **SITE DESCRIPTION**

8. Land uses within 1000 feet of the facility include agricultural land and open spaces and roads.
9. No domestic wells are known to exist within ½ mile of the landfill.

### **SURFACE AND STORM WATER**

10. *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. The Base is drained by several drainage courses including but not limited to, Reeds Creek, Hutchinson Creek, Best Slough and Dry Creek, all of which are tributary to the Bear River and the Feather River. The beneficial uses of these creeks and the Feather River are municipal and domestic supply agricultural irrigation, water contact and non contact recreation (including canoeing, rafting and aesthetic enjoyment), wildlife habitats (including preservation and enhancement of fish invertebrates), potential warm and cold spawning habitats and wildlife habitats, warm and cold freshwater habitat, groundwater recharge, and navigation.

11. Landfill No. 2 is partially within a 100-year floodplain

### **GROUNDWATER**

12. The beneficial uses of the ground water in the area of the Base are municipal and domestic supply, agricultural supply, industrial supply and industrial process supply as designated in *The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition*.
13. Depth to groundwater is approximately 45 to 55 feet. Groundwater flow is generally to the west-southwest.
14. The groundwater gradient at the site ranges from 0.003 to 0.03 feet per foot and slopes to the west..
15. The minimum separation between the base of the landfill and seasonal high groundwater is unknown but estimated to be approximately 20 feet below the ground surface.
16. Landfill No. 2 has six groundwater monitoring wells at the site, including two upgradient wells (MWP-1 and 06C001MW) and four downgradient wells (06A001MW, 06A002MW, 06L003MW and 06L004MW) shown in Attachment B. Groundwater hydrographs show that the groundwater elevation has risen over the last ten years by approximately 1 foot per year. The monitoring wells show seasonal variations of (+/- 5 feet) for the water elevation.
17. Landfill No.3 has six groundwater monitoring wells at the site, including two upgradient wells (MWP-5 and MWP-6) and four downgradient wells (MWP-1, MWP-2, MWP-3 and MWP4) shown in Attachment C. Groundwater hydrographs show a trend that is similar to Landfill No.2. Water elevations have risen by about 1 foot per year over the last ten years. However, the seasonal variations for groundwater are less pronounced and do not show much variation.
18. Groundwater monitoring data for the site has been collected on a regular basis since 1996 at both landfills. Groundwater monitoring activities have detected low concentrations of volatile organic compounds (VOCs) at Landfill No.3. Constituents detected in groundwater are shown in the table, as follows:

**LF No. 2**

Constituent	Concentration, mg/L					
	From 1998 to 2005					
	<u>MWP-1</u>	<u>06C001MW</u>	<u>06A001MW</u>	<u>06A002MW</u>	<u>06L003MW</u>	<u>06004MW</u>
TDS	<b>356-460</b>	<b>270-300</b>	288-413	108-200	214-310	227-320
Chloride	<b>82-210</b>	<b>30-40</b>	15-39	6.5-13	24-53	34-130
Sulfate	<b>20-41</b>	<b>19-38</b>	81-140	8.4-26	7.0-16	5.4-17
Nitrate as N	<b>1.9-2.4</b>	<b>&lt;0.2-0.4</b>	3.6-6.1	3.7-6.8	2.6-3.4	1.5-2.4

**LF No. 3**

Constituent	Concentration, mg/L					
	<u>MWP-5</u>	<u>MWP-6</u>	<u>MWP-1</u>	<u>MWP-2</u>	<u>MWP-3</u>	<u>MWP-4</u>
TDS	<b>156-230</b>	<b>272-490</b>	113-200	146-313	109-200	280-560
Chloride	<b>14-30</b>	<b>68-140</b>	2.1-24	3.6-26	1.7-7.1	88-180
Sulfate	<b>16-34</b>	<b>14-34</b>	10-14	2.1- 4.7	6.1- 20.0	40-61
Nitrate as N	<b>2.4-3.9</b>	<b>1.9-3.2</b>	2.0-2.8	1.8-2.8	1.3-2.1	0.56-1.8
TCE (µg/L)	<b>&lt;0.50</b>	<b>&lt;0.50</b>	0.95-2.6	<0.50	<0.50	<0.50

Data in bold (MWP-1, MWP-5, 06C001MW and MWP-6) indicate background monitoring data

Concentrations for TDS, chloride, sulfate and nitrate do not show a significant upward or downward trend relative to background concentrations. The discharger conducted a statistical analysis of the groundwater data using the Student's t-test for Landfill No.2 and Landfill No.3 between 1998 and 2005 and concluded that groundwater has not been impacted. However, monitoring well MWP-1 located downgradient of Landfill No.3 has detected trichloroethene (TCE) on a regular basis and other VOCs on an infrequent basis during sampling events between 1998 and 2005. However, the concentrations of TCE are relatively low suggesting that the impact to groundwater is limited in extent. This order requires monitoring to continue.

**LANDFILL CLOSURE**

19. Previous WDRs required landfill closure to comply with Title 27 regulations. Both landfills stopped accepting waste in 1993. General residential and base refuse was discharged to Landfill No. 2 until 1980, although dirt, wood and other inert construction and ground maintenance debris continued to be disposed of until 1993. The Air Force used treated fuel spill contaminated soil from numerous underground storage tank (UST) excavation sites around the Base as part of the foundation layer for the final landfill cap at both landfills. The treatment of soil removed from the USTs was conducted at a soil bioremediation facility, which was regulated by Order No. 96-014.

### **Final Closure Plan**

20. Landfill No. 2 and No.3 were closed in accordance with the *Revised Final Closure and Postclosure Maintenance Plan Landfill No.2, dated 15 January 1997* and the *Revised Final Closure and Postclosure Maintenance Plan Landfill No. 3, dated 4 April 1996*.

#### **Landfill No. 2**

21. The final cover construction for Landfill No. 2 included an 18-inch thick vegetative cover, a 12-inch thick compacted clay barrier layer and a 24-inch thick (minimum) foundation layer. The barrier layer was compacted in order to achieve the prescribed permeability of  $1 \times 10^{-6}$  cm/s or less.
22. The final grades for Landfill No.2 include top decks that are sloped at three percent. The side slopes have a maximum horizontal to vertical ratio of three to one. All final slopes are 3:1 or flatter and, therefore, did not require a slope stability evaluation.
23. Surface runoff is collected in unlined V-ditches. Drainage is diverted to existing drainage courses located adjacent to the landfill. The drainage system is designed to drain individual disposal areas. Surface water drainage structures are designed to accommodate flows resulting from rainfall intensities having a probable return frequency of 100 years.

#### **Landfill No. 3**

24. The final cover construction for Landfill No. 3 is an engineered alternative to the prescribed cover. The final cover consists of a 12-inch thick vegetative cover, a 60-mil high density polyethylene (HDPE) barrier layer and a 24-inch thick foundation layer.
25. The final grades for Landfill No. 3 include top decks that are sloped at 2 percent minimum and side slopes have a maximum horizontal to vertical ratio of four to one. The discharger stated that the amount of percolation through the geomembrane on a 2 percent slope is less than the prescribed cover. A slope stability analysis was not performed since all slopes on the landfill are 3:1 or flatter.
26. Surface water drainage is collected in unlined V-ditches that surround the waste disposal areas and are designed to accommodate flows resulting from rainfall intensities having a probable return frequency of 100 years.

#### **Landfill Gas**

27. Elevated levels of methane were detected after the installation of caps on both landfills and have required the installation of landfill gas monitoring and control systems. At Landfill No. 2 and No 3, elevated levels of methane gas at the perimeters of both landfills required the installation of gas vents and perimeter soil gas probes. Soil gas monitoring compliance points consist of shallow probes that have completion depths between 5 and 10 feet below ground surface, and 25 to 30 feet below ground surface. Gas produced by the decomposition

of landfill material includes carbon dioxide, carbon monoxide, hydrogen, hydrogen sulfide, methane, nitrogen, oxygen and trace amounts of other gases. Twenty passive gas vents have been installed to control accumulation and migration of gases from Landfill No. 2. Forty-eight passive gas vents have been installed at Landfill No.3 to control accumulation and migration of gases. Soil gas monitoring data have detected Freon 12 (up to 23,900 ppbv), TCE (up to 260 ppbv), Toluene (5120 ppbv) and other VOCs in gas vents from Landfill No. 3. Freon 12 (up to 5610ppbv), TCE (up to 412 ppbv), PCE (up to 618 ppbv) and other VOCs have been detected in gas vents from Landfill No. 2.

### **COST ESTIMATES AND FINANCIAL ASSURANCES**

28. The Air Force has provided Federal certification for Beale Air Force Base Landfill No. 2 and No.3. This certification is in accordance with Title 14, CCR, Division 7, Chapter 5, Article 3.5, Section 18292 to provide financial assurance for closure and post-closure maintenance of Landfill No. 3. The Air Force has stated that it will make timely requests for funds by identifying to the Department of the Air Force the funding necessary to implement post-closure maintenance activities for Landfill No. 2 and No.3.

### **CEQA AND OTHER CONSIDERATIONS**

29. The action to revise the WDRs for an existing facility is exempt from the provisions of the California Environmental Quality Act (CEQA, Public Resources Code Section 21000, et seq.), in accordance with Title 14, CCR Section 15301.
30. 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 (Monitoring and Reporting Program No. R5-2006-0074, attached) is necessary to assure compliance with these waste discharge requirements. The technical reports required by this Order and the attached Monitoring and Reporting Program are necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the wastes subject to this Order.

31. This Order implements:
- a. *The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition*; and
  - b. Chapters 1 through 7, Subdivision 1, Division 2, Title 27, of the California Code of Regulations, effective 18 July 1997, and subsequent revisions.
  - 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**

32. 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.
33. The Regional Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
34. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.
35. 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. 96-015 is rescinded, and that the Air Force, 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 landfill 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 landfill shall not cause pollution or a nuisance, as defined by the California Water Code, Section 13050, and shall not cause degradation of groundwater or surface water..

4. 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 Monitoring and Reporting Program No. R5-2006-0074 and, during periods of construction, such as cap maintenance, the General Storm Water Permit for Construction Activities, as applicable.
4. A minimum separation of five feet shall be maintained between wastes or leachate and the highest anticipated elevation of underlying groundwater per Section 20240(c) of Title 27.

**C. POST-CLOSURE SPECIFICATIONS**

1. The Discharger shall implement the *Beale Air Force Base-Revised Final Closure and Post Closure Maintenance Plan, Landfill No.2 (January 1997) and the Revised Final Closure and Post-Closure Maintenance Plan, Landfill No.3 (April 1996)* forthwith required under Provision G.5 herein, as approved by Regional Board staff.
2. All final cover slopes shall be capable of withstanding a maximum probable earthquake as defined in Title 27.
3. The final cover shall be designed, graded, and maintained to promote lateral runoff and to prevent, to the greatest extent possible, soil erosion, ponding, infiltration, inundation, slope failure, and washout.
4. 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.
5. Precipitation and drainage control systems shall be designed, constructed, operated and maintained to convey peak flows from a 100-year, 24-hour storm event.

6. The Discharger shall conduct an aerial site survey of the site for the purpose of updating the topographic map for the site at least every five years. The next aerial site survey shall be conducted by **30 June 2007**.
7. Annually, prior to the anticipated rainy season but no later than **31 October**, any necessary erosion control measures shall be implemented and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent storm water flows from:
  - a. Contacting or percolating through wastes,
  - b. Causing erosion or inundation of the landfill cover or other areas of the site, or
  - c. Causing sedimentation and clogging of the storm drains.
8. 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 CIWMB and Local Enforcement Agency.
9. The Discharger shall implement necessary corrective action measures in the event that the landfill closure fails to:
  - a. Meet or maintain performance standards under Title 27 (e.g. minimize infiltration and leachate generation) and/or
  - b. Is not otherwise effective as a corrective action and the deficiencies cannot be rectified with repairs.

Measures proposed to address a known or reasonably foreseeable release shall be considered part of the corrective action program for the landfill and implemented as necessary to address such a known or reasonably foreseeable release.

#### **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 waste discharge requirements. 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 Yuba County Environmental Health 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 Monitoring and Reporting Program (MRP) No. R5-2006-0074. Groundwater monitoring shall include background monitoring and detection monitoring. Background monitoring shall be conducted for the purpose of establishing concentration limits as part of the Water Quality Protection Standard per Section 20400(a) of Title 27. Corrective action monitoring, if necessary, 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 Regional Board staff 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 Regional Board staff 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. R5-2006-0074.
3. The Discharger shall comply with the Water Quality Protection Standard as specified in MRP No. R5-2006-0074 and the Standard Provisions.
4. The concentrations of the constituents of concern in waters passing the Point of Compliance, as defined in Section C.4 of MRP No. R5-2006-0074, shall not exceed concentration limits established in accordance with the MRP.
5. The Discharger shall maintain and implement a Sample Collection and Analysis Plan including the following:
  - a. Sample collection procedures describing purging techniques, sampling equipment, and decontamination of sampling equipment;
  - b. Sample preservation information and shipment procedures;
  - c. Sample analytical methods and procedures;
  - d. Sample quality assurance/quality control (QA/QC) procedures; and
  - e. Chain of Custody control.

#### **MONITORING DATA ANALYSIS**

6. All monitoring data analysis methods shall be consistent with the performance standards specified in Section 20415(e)(9) and sampling standards specified in Section 20415(e)(12).

Some of the monitoring data analysis procedures specified in these WDRs (including the MRP) are different than, or are contradictory to, those specified in the Standard Provisions (incorporated under Provision G.2 of this Order). Monitoring Specifications E.9, E.10, and E.11 clarify which specific constituent groups shall be evaluated statistically and which constituent groups shall be evaluated non-statistically. Monitoring Specification E.11 treats VOCs as individual monitoring parameters rather than as a single combined monitoring parameter as set forth in the Standard Provisions. In accordance with General Provision 8 of the Standard Provisions, the data analysis specifications in the WDRs and MRP shall govern over those of the Standard Provisions in such cases where they are inconsistent.

7. 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 Section 20415(e)(7) of Title 27 that is used in the statistical method shall be **the lowest concentration (or value) that can be reliably achieved** within limits of precision and accuracy specified in the WDRs for routine laboratory operating conditions that are available to the facility. The Discharger's technical report, pursuant to Section 20415(e)(7) of Title 27, shall consider the PQLs listed in Appendix IX to Chapter 14 of Division 4.5 of Title 22, California Code of Regulations, for guidance when specifying limits of precision and accuracy. For any given constituent monitored at a background or 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".
8. For inorganic monitoring parameters and Constituents of Concern (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 Section 20415(e)(8)(E), to establish concentration limits pursuant to Section 20400 of Title 27. 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 water quality data.
9. 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.

10. 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 for 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

11. If the above statistical or non-statistical trigger procedures used for monitoring data analysis for a given media 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 Regional Board staff by phone or e-mail and, within 30 days of such indication, shall collect *two* new (retest) samples from the monitoring point where the release is preliminarily indicated.
  - a. For any given retest sample, the Discharger shall include, in the retest analysis, only the laboratory analytical results for those analytes detected in the original sample. As soon as the retest data are available, the Discharger shall apply the same tests [i.e. 9. for statistical constituents, 10.a or 11.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 (9, 10.a or 11.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 13, below.

Exceedances that the Discharger demonstrates (per Section 20420(k)(7) of Title 27) are the result of sample corruption, laboratory interferences, error, natural variation in the water quality 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.

12. If the Discharger determines that there is measurably significant evidence of a release from the Unit at any monitoring point, the Discharger shall immediately implement the requirements of Response To A Release, contained in the Standard Provisions and Reporting Requirements.
13. 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 the detection monitoring program in accordance with Section E.3.a 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. R5-2006-0074 and in the Standard Provisions.
2. The Discharger shall immediately notify the Regional Board of any flooding, unpermitted discharge of waste off-site, equipment failure, slope failure, or other change in site conditions that could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.
3. The Discharger shall notify the Regional Board in writing of any proposed change in ownership or responsibility of the landfill. To assume ownership under this Order, the succeeding owner must apply in writing to the Regional Board requesting transfer of the Order within 14 days of assuming ownership or operation of this facility. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Regional Board, and a statement. The statement shall comply with the signatory requirements contained in the Standard Provisions (Reporting Requirement 5) and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without

requirements, a violation of the California Water Code. Transfer of this Order shall be approved or disapproved by the Regional Board.

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

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

## **G. PROVISIONS**

1. The Discharger shall comply with the Monitoring and Reporting Program No. R5-2006-0074, which is attached to and made part of this order. A violation of the MRP is a violation of these waste discharge requirements.
2. The Discharger shall comply with the Standard Provisions and Reporting Requirements (Standard Provisions), dated August 1997, which are incorporated herein and made part of this Order by reference. The Standard Provisions contain important provisions and requirements with which the Discharger must comply. A violation of any of the Standard Provisions is a violation of these waste discharge requirements.
3. The Discharger shall maintain waste containment facilities, the landfill final cover, precipitation and drainage controls, monitoring wells, and shall continue to monitor ground water and surface waters per Monitoring and Reporting Program No. R5-2006-0074 throughout the post-closure maintenance period.
4. 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 post-closure maintenance period of the landfill and during subsequent use of the property for other purposes.
5. The Discharger shall update its Post-Closure Maintenance Plan to reflect current operations and requirements under these WDRs and MRP No. R5-2006-0074. The plan shall include post-closure maintenance, monitoring and any additional corrective action measures that may be necessary to comply with these WDRs. A copy of the updated plan shall be provided to the Regional Board by **28 February 2007**.
6. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the State resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature, extent, and impact of the noncompliance.

7. The 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. The Regional Board will review this Order periodically and will revise these requirements when necessary.

I, Pamela 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 23 June 2006.

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PAMELA C. CREEDON, Executive Officer

RRR

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER NO. R5-2006-0074

MONITORING AND REPORTING PROGRAM  
FOR  
UNITED STATES AIR FORCE  
BEALE AIR FORCE BASE LANDFILLS NO.2 AND NO.3  
CLASS III LANDFILLS  
POST-CLOSURE MAINTENANCE AND DETECTION MONITORING  
YUBA COUNTY

This monitoring and reporting program (MRP) incorporates requirements for detection monitoring and maintenance of Landfill No. 2 and No. 3 at Beale Air Force Base, located in Yuba County, California. This MRP is issued pursuant to Water Code Section 13267. Compliance with this MRP is ordered by Waste Discharge Requirements (WDRs) Order No. R5-2006-0074. The Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Executive Officer.

Pursuant to Section 20080(d)(1) of Title 27, the Discharger shall maintain water quality monitoring systems for background and detection monitoring.

**A. SUMMARY OF REPORTING & MONITORING 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	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
	2. Leachate Collection System (if constructed)	Semiannually for COCs
E.	Groundwater Monitoring:	
	1. Elevation	Quarterly
	2. Background & Detection Monitoring	Semiannually
	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

### 1. Semiannual Reports

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required under Order No. R5-2006-0074 and the August 1997 Standard Provisions and Reporting Requirements (SPRR). Reports shall be submitted **semiannually**. Each semiannual monitoring report shall include the following information:

- a. A compliance evaluation summary for the monitoring period as specified in the SPRR (Requirement 2, *Reports to be Filed with the Board, REPORTING REQUIREMENTS*).
- 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, 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. Tables of historical monitoring data for each unit showing well, sampling dates, constituents, concentrations, and concentration limits. The data shall be presented so as to clearly show historical concentrations at each well.
- f. Plots, graphical summaries and a narrative discussion of the results of correction action monitoring, as specified in Section E.3.a herein.
- g. Field and laboratory tests sheets.
- h. An electronic copy of the data in a digital format acceptable to the Executive Officer.

### 2. Annual Monitoring Summary Report

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

- a. Tabular and graphical summaries, including time series plots of historical monitoring data (including the prior year's data) for each monitoring parameter/COC.
- b. A summary of the results of trend analysis performed on each constituent of the release during the prior year.
- c. A summary of the results of water chemistry analysis of water quality data collected during the prior year.
- d. An electronic copy of the data in a digital format acceptable to the Executive Officer.
- e. A copy of the Sampling and Analysis Plan per WDR Monitoring Specification E.5

and the SPRR (Requirement 1, *Provisions for Monitoring*).

The Annual Report may be included in the Second Semiannual Report for each year.

Reports which do not comply with the above-required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the waste discharge requirements.

The semiannual and annual reports shall be submitted to the 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>

**C. WATER QUALITY PROTECTION STANDARD (Section 20390)**

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

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

The constituents of concern (COCs) for the landfill, including monitoring parameters, shall be as listed in Attachments D and E, which are incorporated herein and made part of this Order by reference. The constituent groups are as follows:

**Table C**

<b>Constituents of Concern</b>	<b>Units</b>	<b>Test Method</b>
Field Parameters:	See Attachment E	
General Minerals:	See Attachment E	
Inorganics (dissolved)	µg/L	See Attachment E
Volatile Organic Compounds	µg/L	USEPA Method 8260B
Semi-Volatile Organic Compounds	µg/L	USEPA Method 8270
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)**

- 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.18 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.

Statistical concentration limits shall be based on historical background data and updated as necessary to reflect current background conditions. Prior to calculating concentration limits, the historical data shall be screened for trends to ensure that the data used is of a single statistical population (i.e. does not show appreciable variation per Section 20415(e)(10)). 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 derived only from prior historical data. Concentration limits shall also take into account any seasonality in the data.

**3. Monitoring Points (Section 20405)**

The monitoring points for groundwater monitoring shall be as identified in Sections E.2 and E.3 herein.

**4. Point of Compliance (Section 20405)**

The point of compliance (POC) for the water standard is a vertical surface located at the hydraulically down gradient limit of the Unit that extends through the uppermost aquifer underlying the Unit. The points of compliance for Landfill No. 2 and Landfill No.3 are identified in Section E.3 herein.

**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 (including the landfill toe area) for leachate seeps **monthly** during the wet season and **quarterly** during the dry season as part of standard observations. Any leachate seeps observed during these inspections or at any other time shall be sampled and analyzed for the constituents of concern referenced in Table C herein. Reporting shall be conducted in accordance with the Standard Provisions (*Provision 3, Reports to be Filed with the Board, REPORTING REQUIREMENTS*).

**E. GROUNDWATER MONITORING**

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

The groundwater surface elevation (in feet and hundredths, MSL) in all wells and piezometers shall be measured on a **quarterly** basis. Groundwater elevations taken prior to purging the well and sampling for Monitoring Parameters may be used to fulfill this

requirement. Groundwater elevations for all upgradient and down gradient wells for a given groundwater body shall be measured within a period of time short enough to avoid temporal variations in groundwater flow which could preclude accurate determination of groundwater gradient and direction. The results of groundwater elevation monitoring shall be displayed on a water table contour map and/or groundwater flow net for the site and included in each monitoring report. The Discharger shall use the groundwater elevation monitoring data to determine the following:

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

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

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

The Discharger shall install and operate a sufficient number of Background Monitoring Points at appropriate locations and depths to yield ground water samples from the uppermost aquifer that represent the quality of ground water that has not been affected by a release from the units per Section 20415(b)(1)(A) of Title 27. Background monitoring data analysis shall include developing/updating concentration limits for statistical monitoring parameters and COCs, as necessary.

At Landfill No.2, background groundwater monitoring points shall consist of MWP-1 and 06C001MW. At Landfill No.3 background groundwater monitoring points shall consist of MWP-5 and MWP-6 and, at either facility, any future wells installed upgradient of the landfill for background monitoring. The monitoring schedule shall be as specified in Table E.3B.

**3. Detection Monitoring (Sections 20420 and 20430)**

The Discharger shall install and operate a groundwater detection monitoring system for the purpose of monitoring the uppermost aquifer that represents the quality of groundwater passing the point of compliance. A sufficient number of samples shall be taken from all Monitoring Points and Background Monitoring Points to satisfy the data analysis requirements for a given Reporting Period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible. Collection and analysis of samples shall be in accordance with procedures set forth in the Sampling Collection and Analysis Plan per Monitoring Specification E.5 of the WDRs.

For Landfill No.2 the detection monitoring points shall include monitoring wells 06004MW, 06A001MW, 06A002MW and 06L0003MW. For Landfill No.3 the detection monitoring points shall include monitoring wells MWP-1, MWP-2, MWP-3 and MWP-4. Groundwater samples shall be collected and analyzed in accordance with the following schedule:

**Table E.3B**  
**Detection 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	OC	Semiannually	---	---
Turbidity	NTU	Semiannually	---	---
<b>Monitoring Parameters (Attachment C)</b>				
General Minerals:				
Chloride	mg/L	Semiannually	Interwell	Intrawell
Nitrate as N	mg/L	Semiannually	Interwell	Intrawell
Sulfate	mg/L	Semiannually	Interwell	Intrawell
TDS	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	Annually	Interwell/Intrawell	Intrawell
VOCs	µg/L	Annually	Intrawell	Intrawell
<b>Constituents of Concern (Table C and Attachment D)</b>		Every 5 years		

COC monitoring under this Order shall be conducted by **15 December 2007** and at least every five years thereafter. Any COC that is confirmed by retest (i.e. per WDR Monitoring Specification E.21) to be a constituent of a release shall be added to the monitoring parameter list per Table 3B herein and Attachment C. In such cases, the Discharger shall also follow the Response to Release requirements of the WDRs (Monitoring Specification E.22) and 1997 Standard Provisions, as necessary.

- a. Monitoring data analysis shall include the following:
  - i. Background Data
    - Updating concentration limits for statistical monitoring parameters and COCs, as necessary.

- ii. Nature and Extent of Release
  - Comparisons with concentration limit to identify any new or previously undetected constituents at a monitoring point.
  - Water chemistry analysis, as necessary, by appropriate methods (i.e. ion balance, Piper diagram, Stiff diagram etc.).
  
- iii. Effectiveness of Detection Monitoring
  - Preparation of time series plots for representative constituents
  - Trend analysis for each constituent using appropriate statistical and graphical methods (e.g., Mann-Kendall).
  - The effectiveness of closure as a corrective action and whether the closure continues to meet Title 27 performance standards
  - The need for additional corrective action measures and/or monitoring wells.

The results of the above analysis, including a narrative discussion, shall be included in each semiannual report and summarized in the Annual Report, as specified under reporting Section B above.

## **F. FACILITY MONITORING**

### **1. Standard Observations**

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

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

Landfill facilities (i.e. monitoring wells) shall be inspected **quarterly** to identify the need for maintenance and repairs. 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), 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.

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. Surface Water**

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

<u>Landfill No.2</u>		
<u>Monitoring Point</u>	<u>Location</u>	<u>Drain</u>
06L001SW	Upstream	Natural drain
06L005SW	Downstream	Hutchinson Creek
06L004SW	Downstream	Hutchinson Creek
06L003SW	Downstream	Natural drain
06L002SW	Downstream	Natural drain
<u>Landfill No.3</u>		
<u>Monitoring Point</u>	<u>Location</u>	<u>Drain</u>
SWMP-1	Upstream	Natural drain
SWMP-2	Downstream	Natural drain
SWMP-3	Downstream	Natural drain

Surface water monitoring shall be conducted semiannually for the field and monitoring parameters specified in Table E.3.B (except for elevation). Five-year COC monitoring shall not be required for surface water. If monitoring data analysis (see Monitoring Specifications E.18 through E.20) indicates that there has been a release to surface water from the landfill, the Discharger shall propose additional monitoring locations to delineate the extent of the impact and design corrective measures, as necessary, in accordance with Sections 20425 and 20430 of Title 27.

The Discharger shall implement the above monitoring program on the effective date of this Program. The transmittal letter accompanying monitoring reports submitted under this Order shall, as required under the Standard Provisions (*Provision 5, General Requirements, REPORTING REQUIREMENTS*), contain a statement by the discharger, or the discharger's authorized agent, under penalty of perjury, that to the best of the signer's knowledge the report is true, accurate and complete.

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

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

Attachments  
RRR

## INFORMATION SHEET

ORDER NO. R5-2005-0074  
UNITED STATES AIR FORCE- BEALE AIR FORCE BASE  
LANDFILLS NO. 2 AND NO.3  
CLASS III LANDFILLS  
POSTCLOSURE MAINTENANCE AND MONITORING  
YUBA COUNTY

The United States Air Force owns and formerly operated several landfills at Beale Air Force Base. Beale Air Force Base operated Landfill No. 2 from the early 1950's until 1993 and operated Landfill No. 3 from 1981 until 1993. Landfill No. 2 received photo waste treatment sludge, unknown amounts of petroleum/chemical wastes, residential and general base refuse until 1980. After 1980 and until 1993, Landfill No. 2 accepted dirt, wood, and other inert construction and ground maintenance debris. Landfill No. 2 covers 56 acres and Landfill No. 3 covers about 27 acres. Landfill No. 2 was operated as a trench and fill with 15 to 20 foot deep trenches. In Landfill No. 3 wastes were discharged to trenches 15 to 25 deep, 40 to 60 feet wide at the top, and 600 to 2000 feet in length

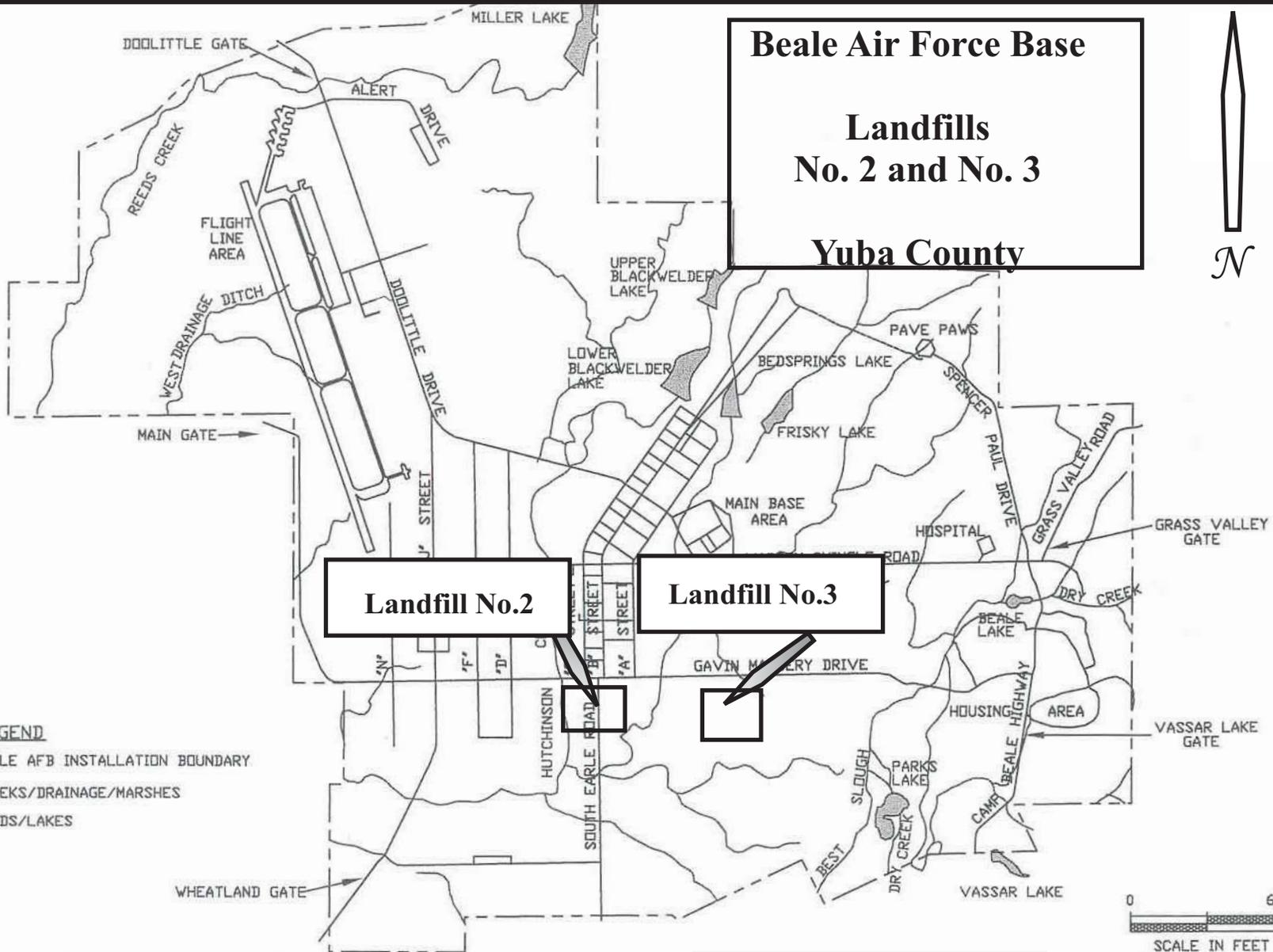
Closure of the Landfills was completed between 1996 and 1997 and was conducted in accordance with the *Revised Final Closure and Post Closure Maintenance Landfill No. 2 Report, January 1997* and the *Revised Final Closure and Post Closure Maintenance Plan Landfill No. 3 Report, April 1996*. The cover of Landfill No. 2 is comprised of a 24- inch thick foundation layer, a 12-inch thick clay cap and an 18-inch thick vegetative layer. The cover of Landfill No. 3 is comprised of a 24-inch thick foundation layer, 60-mil high density polyethylene (HDPE) barrier layer and a 12-inch thick vegetative layer. The landfills do not contain leachate collection and removal systems,

These revised Waste Discharge Requirements for post closure maintenance and monitoring replace Waste Discharge Requirements Order No. 96-015.

There are six groundwater monitoring wells at Landfill No.2. Two (MWP-5 and MWP-6) of these wells are upgradient of the landfill and four wells (MWP-1, MWP-2, MWP-3 and MWP-4) are downgradient of the landfill. There are six groundwater monitoring wells at Landfill No. 3. Two (MWP-5 and MWP-6) of these wells are upgradient of the landfill and four wells (MWP-1, MWP-2, MWP-3 and MWP-4) are downgradient of the landfill. Monitoring well MWP-1, downgradient of Landfill No.3, has detected low concentrations of trichloroethene (TCE) on an infrequent basis. Concentrations of TCE have ranged from 0.95 to 2.6 µg/L. The concentrations are relatively low suggesting that the impact to groundwater is limited in extent. This order requires continued monitoring of groundwater at both landfills.

RRR: 4/21/06

**Beale Air Force Base**  
**Landfills**  
**No. 2 and No. 3**  
**Yuba County**



**Landfill No.2**

**Landfill No.3**

**Attachment A**

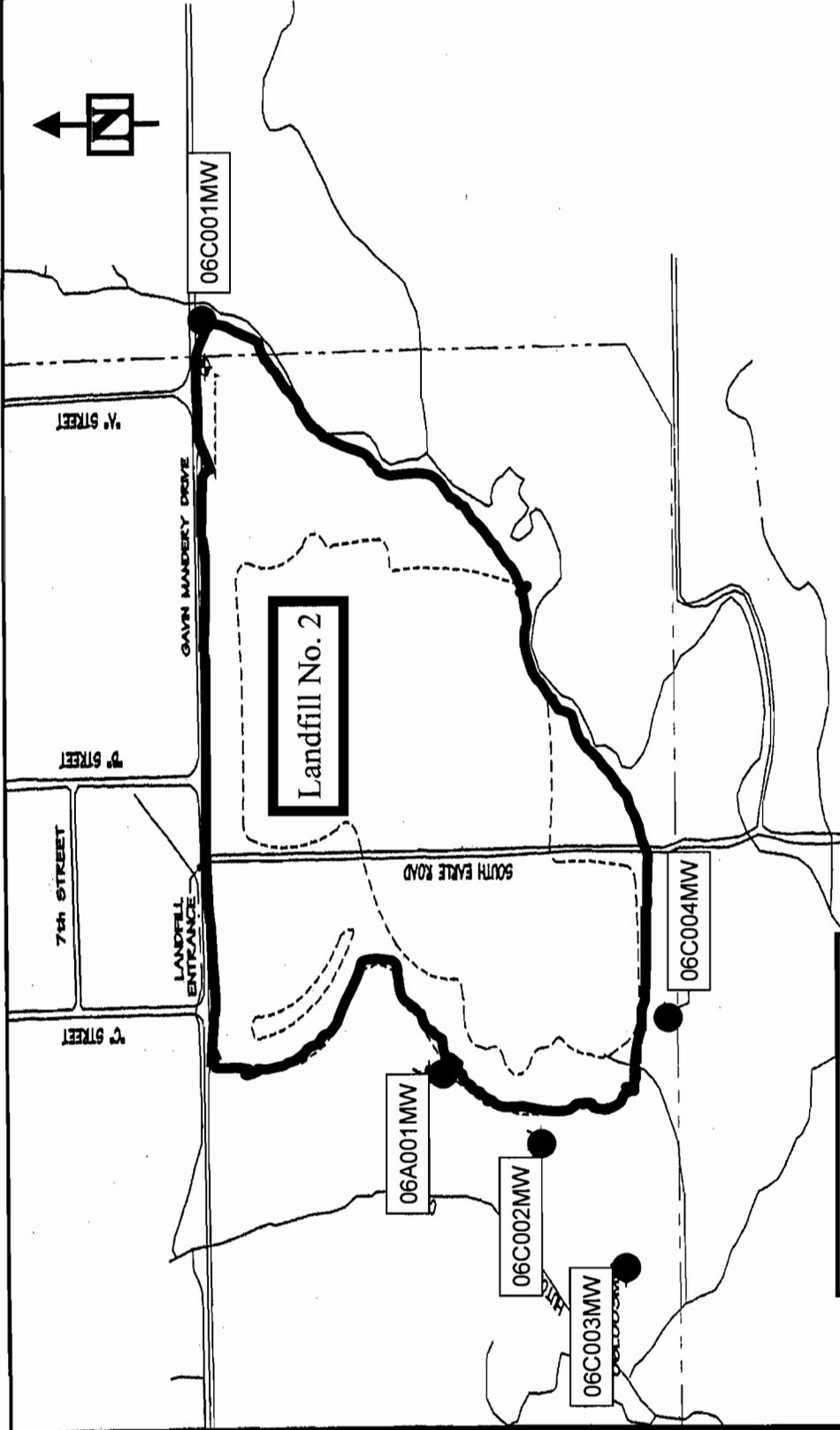


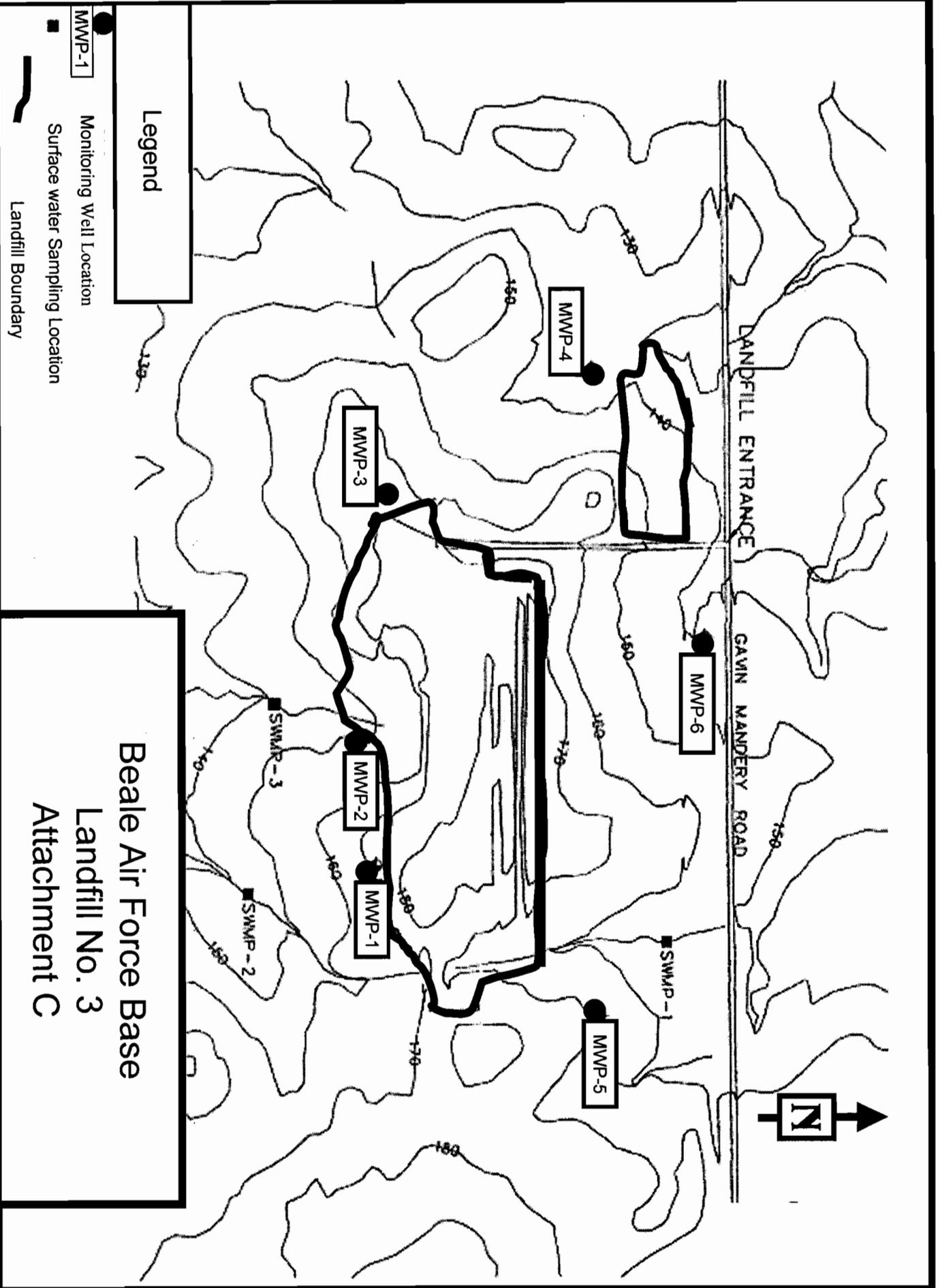
# Beale Air Force Base Landfill No.2 Attachment B

## Legend

● Monitoring Well Location

— Landfill Limits





## ATTACHMENT D

### 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 D (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 D (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 E

### 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 E (CON'T)**

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

**Volatile Organic 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 E (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 E (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 E (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 E (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 E (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.